# Courant Research Centre

## 'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'

**Georg-August-Universität Göttingen**
**(founded in 1737)**


Discussion Papers

**No. 268**

# Spending or Saving? Female Empowerment and Financial Decisions in a Matrilineal Society

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**First Version: November 2019**
**This Version: May 2020**

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# Spending or Saving? Female Empowerment and Financial Decisions in a Matrilineal Society

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This version: May 29, 2020.

**Abstract**

This paper looks at household consumption and financial decisions made in a matrilineal society where women are traditionally the household financial managers. This culture was strongly altered by the British in the mid-19th century through Christian missionaries who proclaimed that the role of the household manager is ascribed to men and not to women. Using self-collected data of 650 individuals from the matrilineal state of Meghalaya, India, and exploring household's distance to the historical Protestant base in Cherrapunji, we find evidence that households in which women are empowered spend more on welfare enhancing goods, such as food, but are less likely to have savings left at the end of the month. Our paper contributes to the literature by investigating how a historical shift in female empowerment, mostly driven by cultural norms, can have long-term effects on financial decisions.

*JEL-Classification*: I3, O1, R20, Z1.

*Keywords*: female empowerment, matrilineality, culture, savings, India, Protestant missions

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# 1 Introduction

Female empowerment has become an important goal in the field of development economics in the past decades. With the inclusion of gender equality in the United Nation's Millennium Development Goals (MDGs), increased effort has been directed towards the reduction of gender discrimination and the promotion of gender equality at the private and public level. Although the empowerment of women is indeed desirable in its own right, existing evidence shows that it also has indirect effects on children and society at large (Bobonis, 2009; Ashraf *et al.*, 2010; Doepke and Tertilt, 2019). Duflo (2003), for instance, shows that when household economic resources are controlled by women, there is an improvement in children's education and nutrition, as well as an increase in investments in durable goods. Similarly, Thomas (1990) provides evidence that when financial resources are controlled by mothers, there is an improvement in health outcomes of other household members. Additionally, existing evidence has shown that increasing the bargaining power of females reduces household expenditures on alcohol and cigarettes, as these products are more typically aligned with male consumption patterns (Rubalcava and Thomas, 2000).

Although these studies indicate that *empowering* previously unempowered females leads to welfare-increasing financial decisions, it remains unclear, a priori, if females who *are fully empowered* have similar expenditure behaviors. This paper contributes to the literature by looking at household financial decisions in a setting where women are empowered by cultural reasons rather than due to a shift in economic resources. We exploit a historical event, namely the arrival of the Protestant British missions in the matrilineal state of Meghalaya, India, as a source of exogenous variation in female empowerment. We then test the hypothesis that empowered women make different financial decisions than less empowered women. Using original microdata on financial decisions, sociodemographic characteristics, and female empowerment collected in three Khasi districts of Meghalaya (East Khasi Hills, West Khasi Hills and RiBhoi), we provide causal evidence that empowered females spend more on food and nutrition, at the expense of savings. Two features of our data make them particularly attractive for the investigation of our research question.

First, the data focus specifically on intra-household financial decisions in a matrilineal society, which has rarely been investigated in the literature. Second, the data contain information on several different measures of female empowerment, including women's roles in household financial decisions and land ownership, among others.

Our results also show that fully empowered women spend more on welfare-increasing goods, such as nutrition, but have less savings at the end of the month. Our results are in line with Doepke and Tertilt (2019), who show that female empowerment increases investments in human capital but decreases capital accumulation. The authors also emphasize that the impact of female empowerment on long-run economic growth is contingent on the economy's productive structure. While a reduction in savings might be harmful for economies that depend heavily on physical capital, the opposite is expected for economies whose primary production factor is labor. Hence, a better understanding of the effects of female empowerment on financial behavior is particularly relevant for both the assessment of long-run economic growth and the development of female empowerment policies in India and other emerging economies.

The North-Eastern Indian state of Meghalaya is a unique setting for the investigation of our research question for a number of reasons. First, Meghalaya's traditional Khasi culture persisted in many parts of the state and remained mostly unaffected by external influences. The Khasis live in a very isolated area of the Meghalaya Hills, a mountainous area in the North East India. The Khasis are one of the few matrilineal cultures in the world; inheritance follows the mother's lineage and women play an important role in household's decisions. Men, on the other hand, are responsible for religious, political, and farming activities outside the household (Nongbri, 1993). Girls learn their roles from young age and grow into textbook examples of empowered females, similar to boys who grow up in a patriarchal cultural environment. The existence of this clear division in gender roles among the Khasis thus offers a unique and natural testing ground for an investigation into the household financial decisions of empowered females. First, we observe whether fully empowered females who are culturally responsible for all of their households' financial decisions still spend more on welfare-increasing items, as is observed among marginally-

empowered females in more patriarchal settings.[1] One could expect, for instance, that once females have full power to allocate household financial resources amongst many different expenditure items, expenditures on food and education may decrease, as other investments which are not primarily welfare-increasing may become more relevant.

Secondly, we make use of an exogeneous event: the arrival and historical influence of the British Protestant Missions in Meghalaya. This event introduced a source of exogenous variation in female empowerment through the establishment of non-matrilineal social values among the Khasis. Specifically, the Missions established patrilineal property inheritance laws, institutionalized marriage, and shifted the focus of the educational system towards male education-policies which all had far-reaching impacts on the Khasis. We exploit the fact that the Protestant British missions expanded slowly throughout the 19th Century from their main bases in Cherrapunji and Shillong, introducing heterogeneity in exposure to patrilineal values (Nakane, 2019). We use the distance to the former British bases in Cherrapunji and Shillong as instruments to investigate our research question.

Finally, in a step unique from most of the existing papers on the long-run effects of Christian missionaries, which document the positive effects of missions on a range of development outcomes, we use proximity to the missions as an exogenous instrument for the dilution of matrilineal values and a reduction in gender equality. This setting is particularly interesting because it allows us to explore the symmetry of the effects of female empowerment on financial decisions in a setting where women were historically disempowered. This is only possible in a natural experimental setting, due to obvious ethical concerns.

Our instruments are highly correlated with three indicators of female empowerment. For instance, we provide evidence that households living further away from the historical Protestant mission in Cherrapunji are more likely to report that a female is responsible for short-run and long-run financial decisions and are more likely to have land titles held in the name of a woman. By including a range of individual and household controls and

[1] In patriarchal societies, men usually handle household's investments and savings, whereas these type of expenditures are also handled by females in matrilineal societies.

contemporary measures of local development, we reduce concerns that our instrument operates through channels other than female empowerment.

Our paper is closely related to three main strands of research on the topic: those connecting female empowerment to intra-household decision making (e.g. Manser and Brown (1980); Hoddinott and Haddad (1995); Duflo (2012); De Brauw *et al.* (2014); Doepke and Tertilt (2019)), those investigating the long-run effects of cultural norms and institutions (e.g. Nunn (2008); Mantovanelli (2013); Castelló-Climent *et al.* (2017); Calvi and Mantovanelli (2018); Valencia Caicedo (2019), and those focusing on traditional matrilineal societies (e.g. Andersen *et al.* (2013); Asiedu and Ibanez (2014); Filipiak (2016); Lowes (2017, 2018)). To the best of our knowledge, this is the first paper which explores a link between a historical exogenous cultural shock causing a decrease in female empowerment and household financial decision-making among women. By taking a closer look at the infrastructural developments around the Protestant British missions, we also shed light on a possible channel through which social norms were transmitted over the centuries.

The remainder of the paper proceeds as follows. The next section discusses the relevant literature on female empowerment and intra-household decision-making and presents our hypotheses. Section 3 describes the Khasi culture and the British rule. Section 4 presents our data. The identification strategy and our empirical methodology are discussed in section 5. Our main results, robustness checks, and transmission channels are discussed in section 6. The final section concludes.

## 2 Theoretical background

This section begins with a discussion of the most important economic theories on female empowerment, then proceeds to discuss the link between female empowerment and financial decisions in the context of the matrilineal state of Meghalaya. It concludes by outlining our hypotheses on the effects of female empowerment on welfare-increasing expenditures and savings.

## 2.1 Intra-household bargaining power

Early economic theory traditionally treated the household as a single unit (Samuelson, 1956; Becker, 1965), with members having similar utility functions and preferences. In these models, household decisions are Pareto efficient and do not involve a bargaining process, which implies that the outcome of the decision process is independent of the identity of the decision maker. More recently, a number of theoretical and empirical studies have rejected these unitary models of decision making, replacing them with the so-called non-unitary models (Manser and Brown, 1980; McElroy and Horney, 1981). In these latter models, decisions are assumed to be made through a bargaining process and dependent on two factors: (i) each household member's bargaining power; and (ii) each household member's preferences. This implies that, in non-unitary models, the identity of the decision maker is relevant for the outcome of the household's decision making process.

Using representative data from the US, Smith *et al.* (2010) provide evidence that there is a strong tendency for men to be the household financial managers, and this is only less common in cases where wives are considerably older than their husbands. In a similar vein, Ashraf (2009) shows that increasing women's bargaining power through an increase in income changes household financial decisions significantly. The author emphasizes, however, that this effect also depends on other factors, such as the share of information and communication among spouses.

The literature investigating intra-household decision-making often argues that individual bargaining power depends primarily on the amount of income that each partner contributes to the household. In this sense, a positive income shock to one of the partners would increase his/her bargaining power and shift the outcome of the decision-making process in his/her favor (Manser and Brown, 1980). This, however, might be even more pronounced in developing countries such as India, where gender roles are often still strictly embedded in culture. In line with the theory, existing evidence based on observational data has shown that control over resources indeed leads to control over decisions (Lundberg *et al.*, 1997). One of the main implications of these models, therefore, is that if women

receive a positive income shock and become more empowered, financial decisions would shift and align with their preferences.

## 2.2 Preferences

Most of the non-unitary models of the household assume that women have different preferences than men, with female preferences being more aligned with children's welfare. To test this hypothesis, the empirical literature typically explores exogenous changes in women's bargaining power to isolate the effects on household financial decisions. Using data from the Ivory Coast, Duflo and Udry (2004) show that rainfall shocks that benefit traditionally female-tended crops shift household expenditures towards food consumption, which improves child nutrition. Similarly, Duflo (2003) provides evidence that exogenous increases in pensions to grandmothers improve the nutrition of young girls – but not young boys – in South Africa.

Another strand of the empirical literature explores conditional cash transfer programs, which typically target women, to investigate how a shift in female income affects household expenditures. Using data from the PROGRESA conditional cash transfer program in Mexico, Attanasio and Lechene (2010) show that, by shifting the Engel demand curve, income transfers to women kept the share of household food expenditure constant, even though it was expected to fall as a consequence of the increase in total household resources. Also using data from PROGRESA, Rubalcava *et al.* (2009) and Bobonis (2009) provide evidence that putting money in the hands of women increases investments in children in Mexico. Similar results have been found in Brazil, where the conditional cash transfer program Bolsa Família has been shown to promote female empowerment and investments in children's education, health, and durable goods (De Brauw *et al.*, 2014). Exploring a program in Macedonia where the gender of the recipient of an income transfer was randomized, Armand *et al.* (2016) show that cash in the hands of mothers, rather than fathers, increases the share of food consumption by 4 to 5 percentage points. In a field experiment in the Philippines, Ashraf *et al.* (2010) randomly provide commitment savings

accounts to women and men and find that women's self-reported bargaining power increases significantly. Additionally, they provide evidence that there is a shift in expenditures towards female oriented consumption goods.

From the experimental literature, a large number of studies shows that women have different preferences than men (see Andersen *et al.* (2013) for a summary). Women have been found to be more risk averse (Dohmen *et al.*, 2011; Eckel and Grossman, 2008), more patient (Dittrich and Leipold, 2014), more pro-social (Eckel and Grossman, 1998) and less trusting (Buchan *et al.*, 2008), although the evidence on trust is mixed. Existing evidence also indicates that women's preferences are more aligned with family welfare. Doepke and Tertilt (2019) present a theoretical model that predicts that while empowering women is expected to promote growth in societies whose economies depend mostly on human capital, the opposite effect is expected for societies that depend mostly on human capital and land. Testing the model predictions with data from PROGRESA in Mexico, the authors show that while cash transfers to women caused an increase in the investments on children, this occurred at the expense of savings, which illustrates well the trade-off between human and physical capital accumulation in female intra-household financial decision making.

What remains unclear as yet, in the literature, is whether women's financial decision making behavior changes in settings where women *are* fully empowered, i.e., for cultural reasons, in contrast to settings where they *become* relatively more empowered through income changes. Existing studies point to the fact that women who live in the matrilineal society of the Khasis, considered to be fully empowered, differ in many aspects compared to less empowered females. Gneezy *et al.* (2009), for instance, show that females living in the matrilineal state of Meghalaya are more competitive than less empowered women living in a patrilineal society, and as competitive as males living in those cultures. Rink *et al.* (2019) show that no gender gap in financial literacy exists in the matrilineal societies in India, whereas such a gap is a common phenomenon in both developing and developed countries. So far, studies show that empowering females in patriarchal environments, for example with positive income shocks, increases household expenditures on welfare-increasing goods, such as investments in children's education. One could argue that, in settings where males have

more control over resources, women might try to reallocate household expenditures towards welfare-increasing goods due to existing patterns of specialization. However, it remains unclear whether those differences in behavior are fully explained by differences in innate preferences, and whether these preferences change with higher levels of empowerment. The matrilineal setting, therefore, allows us to investigate if the preferences of *fully* empowered females resembles the preferences of males in patriarchal settings or that of *economically* empowered females. Until now, there has been no clear empirical evidence on the financial decisions of females when they are fully empowered, which we investigate in this paper.

## 2.3 Female empowerment and financial decisions

Some of the more recent economic theories on household financial decisions relax the assumption that females and males have different innate preferences, and explain differing financial decisions on the basis of which resources are controlled by each household member. Doepke and Tertilt (2019), for example, show theoretically that even if women and men value private and public goods (such as children's human capital) in the same way, an increase in female resources would still lead to more spending on children.

They argue against the "preference hypothesis" and assume that it is the specific role that each spouse plays within the household that explains financial decisions. In their non-cooperative model, each spouse has his or her own individual budget constraint. Each household consists of a couple- a woman and a man- who both derive utility from a set of public goods in the household. Both have symmetric preferences, and the provision of public goods is determined by a Nash equilibrium between the spouses. Each spouse produces public goods, which vary in their time-intensiveness, and this must be considered in combination with the share of labor of the spouse, assuming that time and goods inputs cannot be separated between spouses. Both spouses then maximize their utility, taking the other spouse's behavior as given. The budget constraint is the given wealth and the time spent on public good production which cannot be spent on labor. They argue also that men and women are involved to different extents in the production of public goods.

In countries where labor market wages for women are low compared to men, women would focus on the production of time intensive public goods such as the welfare of children. As a consequence, when resources are transferred to women rather than to men, spending on nutrition and education would increase. At the same time, spending on labor-intensive goods and investments would decrease, as these are the goods that men specialize in. In this case, a shift in resources towards women is predicted to cause a decrease in physical investment and therefore a decrease in business growth. There is also empirical evidence for this model; De Mel *et al.* (2009) find that a transfer to male small business owners leads to an increase in profits, while the same does not apply to female business owners.

We can transfer this household-specialization model to the Khasis, where women and men must decide how to spend their household income on different types of public goods, including savings. In the traditional Khasi culture, women are responsible for household expenditure decisions– particularly long-term savings and investment decisions- which in a patriarchal environment are typically assigned to men. They also earn similar to higher wages compared to their male counterparts, working in occupations which in more patriarchal environments are almost exclusively allocated to men (e.g. positions as petrol station attendants and taxi drivers, as well as professorships at universities and other high-level occupations). Thus, considering the labor market wage argument by **?**, Khasi women could be more inclined to focus on the production of time less intensive public goods. Although men in the Khasi culture are engaged in the production of labor-intensive goods, the final decisions on how to spend household income lies with the female household head. Thus, empowered Khasi women face another budget constraint compared to less empowered women living in more patriarchal cultures, and so it remains unclear as to whether or not fully empowered women would still spend more on welfare increasing goods.

Women who grow up in a patriarchal environment learn from an early age that the husband will be primarily responsible for income, investments, and household expenditures, while the spouse will be in charge of childcare and housekeeping, as though they are specializing in the production of these time-intensive goods. In a matrilineal society, on the other hand, young girls learn from an early age that they will be the future household

managers, and will one day be in charge of the allocation of all of the household's financial resources. . In this case, however, one would also assume that they would be less likely to have savings left at the end of the month, since savings are considered as a public good. In a patriarchal environment, where women have stricter budget constraints and specialize in the production of more time-intensive goods, women might be more likely to have savings leftover at the end of the month.

Among the Khasis in Meghalaya, variations in female empowerment also exist, introduced mainly through the proliferation of Christianity and the impact it had on the empowerment status of Khasi women. Some women remain fully autonomous in terms of intra-household financial decisions, while others make decisions in concordance with their husbands or rely solely on their husbands' decisions. If indeed, differences in female empowerment structures lead to different financial decision, we could observe this among the Khasis.

From the preceding theoretical framework we derive the following hypotheses: (i) households where women are more empowered make different financial decisions than households where women are less empowered; (ii) households where women are empowered spend more on the welfare of children than households where women are less empowered, as they have more financial resources available to allocate towards these goods; and (iii) households where women are empowered save less at the end of the month, as savings are considered to be a public good.

# 3 The Khasis and the British rule

The matrilineal culture found in Meghalaya has been used as a natural experiment in a number of other papers (Gneezy *et al.*, 2003; Rink *et al.*, 2019; Asiedu and Ibanez, 2014). Rink *et al.* (2019) show that, unlike most countries studied so far, women in this part of India are just as financially literate as men. This also applies to their self-reported financial knowledge (Filipiak, 2016). Asiedu and Ibanez (2014) also show that women in Meghalaya are more likely to punish in a public goods game with third party punishment.

In this section, we discuss the characteristics of this matrilineal society as well as the historical influence of the Protestant British Missions, which constitutes the basis of our identification strategy.

## 3.1 The Khasis

The Khasis are besides the Garos and the Jaintias one of the main ethnic communities in Meghalaya, a mountainous state in North East India that borders Bangladesh and Assam. After independence, Meghalaya was separated from Assam in 1972. Although it is not known when exactly the three tribes settled in the hills of Meghalaya, they had likely been there centuries before the Indian subcontinent was unified for the first time under the British rule (Gait, 1906; Nolan, 2002; Dalby, 2015). Until today, the Khasis reside predominantly in the Khasi Hill districts in the center of Meghalaya (West Khasi Hills, East Khasi Hills, and Ri Bhoi). The inaccessibility and remoteness of Meghalaya's hills have minimized external cultural influence besides the confrontation with the British rule in the 19th century, so that many Khasi traditions have been preserved and an exceptionally large share of Meghalaya's population have conserved their tribal identity (Gait, 1906; Herzog, 2001).

In the Khasis matrilineal culture, women are considered to be the household head and inheritance follows the mother's lineage. The youngest daughter, the *Khaddu*, inherits the largest share of the families property and becomes the household head of the family in the future. She is traditionally seen as the manager of assets and financial resources, subject to the advice of an elder man, usually the mother's brother (Herzog, 2001). Men in this society are ascribed to religious, political or farm activities outside the household (Nongbri, 1993).

When analyzing the power relations within the Khasi culture, Herzog (2001) emphasizes that there is a symmetry of power between men and women, with a clear division of roles over the different spheres of life. Until today, this power balance is reflected with different social indicators. Meghalaya is amongst the Indian states with the highest sex ratios:

989 females per 1000 males, according to the Census of India 2011, resembling that of developed countries. This sex ratio stands out in a nation which is otherwise known for its large share of "missing women" (Sen, 1992). In fact, Klasen and Wink (2003) update the estimates for the number of missing women in developing countries and find that, despite some improvements, India has the largest share of missing women in South Asia today. Also, the overall literacy rate in Meghalaya is very high in comparison with other Indian states: 73 percent for females and 76 percent for males (for Population Sciences , IIPS). Thus, the Khasi culture provides a natural testing ground for investigating household consumption and expenditure patterns of empowered women who learn this role from early childhood.

## 3.2 The British rule

The British influence in India started in 1600 under Elisabeth I. The expansion towards the North-East of India ended with the victory of the First Burmese War (1826) that led to the annexation of the province of Assam - from which Meghalaya was part of until India's independence in 1972 (Paxton, 1999). Being considered "savage", "barbarous" and "primitive" tribes [...] due to their inadequacy of dress, war-like habits, most Khasi siemships remained nominally independent under the British (Chaube, 1999).

However, already in 1833, a Serampore missionary school opened in Cherrapunji where also the British administration of Assam settled at first. In 1841, the Serampore Mission was replaced by the Welsh Presbyterian Mission which introduced the Roman script and put more emphasis on proselytization (Chaube, 1999). The rapid progress of Christianization in the Empire was mainly driven by the work of Welsh and Baptist Missions which were active among the hill tribes in Assam, especially the Khasis (Meyer *et al.*, 1909). Education and other social services were almost entirely left to the Church which also administered most of the schools at that time. The exceptional presence and proselytizing efforts of Christian missionaries explains why today much of the Khasis have become Christians. For instance, in our sample more than 95 percent of the individuals

are Christians.

Overall, the British rule had far-reaching cultural impacts on the matrilineal Khasi society. Especially the fact that both administrative units and educational system addressed predominantly males, challenged the existing matrilineal rule. The matrilineal system of inheritance from the Khasis was hardly compatible with the property inheritance laws introduced by the British, who also introduced their type of marriage as an institution (Chaube, 1999). Hence, although the matrilineal traditions remain widely intact today, the patriarchal influence of British rule induced considerable cultural change among the Khasis. The continuum between conservation and assimilation is summarized in the *Dictionary of Language* (Dalby, 2015):

*[. . . ] Yet Shillong, in the temperate Khasi hills, had made an ideal provincial capital for all of British Assam. There was also early interest in Khasi speakers on the part of Welsh Presbyterian missionaries, who devised a Latin orthography for Khasi in 1842, on the basis of the dialect of Cherrapunji, which preceded Shillong as a radiating point for British influence. The missionaries also introduced primary and secondary education and founded a theological seminary. Thus, though politically independent, Khasi speakers in fact underwent significant English speaking cultural and linguistic influence.*[2]

Cherrapunji and Shillong were the main hubs of Christian missionaries among the Khasis. Figure A2 shows the location of Christian missions in India, as of 1893. In our main specification, therefore, we use the distance to Cherrapunji and Shillong as instruments for female empowerment, exploiting the fact that proximity to the missions is related to the degree of historical exposure to the British Protestant values. As Shillong is the capital of the state of Meghalaya, arguing for the exclusion restriction of our instrument is less straightforward. However, as it will be discussed in the next section, we employ the distance to Cherrapunji as our main instrumental variable and show several strategies

[2]The source also mentions the influence on the Garos and Jaintas, who are also matrilineal societies. "*When they are first heard of in historical records, in the 16th century, Khasi speakers already made up twenty-five chiefdoms, which persisted through British times into the period of Indian independence. Jaintia came under British rule in the 1850s, but the other Khasi chiefdoms remained nominally independent, and as such were transferred to the suzerainty of the Governor of Assam in 1947 as the United Khasi-Jaintia Hills District, later to be joined with the Garo Hills in the state of Meghalaya.*"

to reduce concerns about the excludability of our instruments. Overall, the results using both distances point in the same direction.

# 4 Data and descriptive statistics

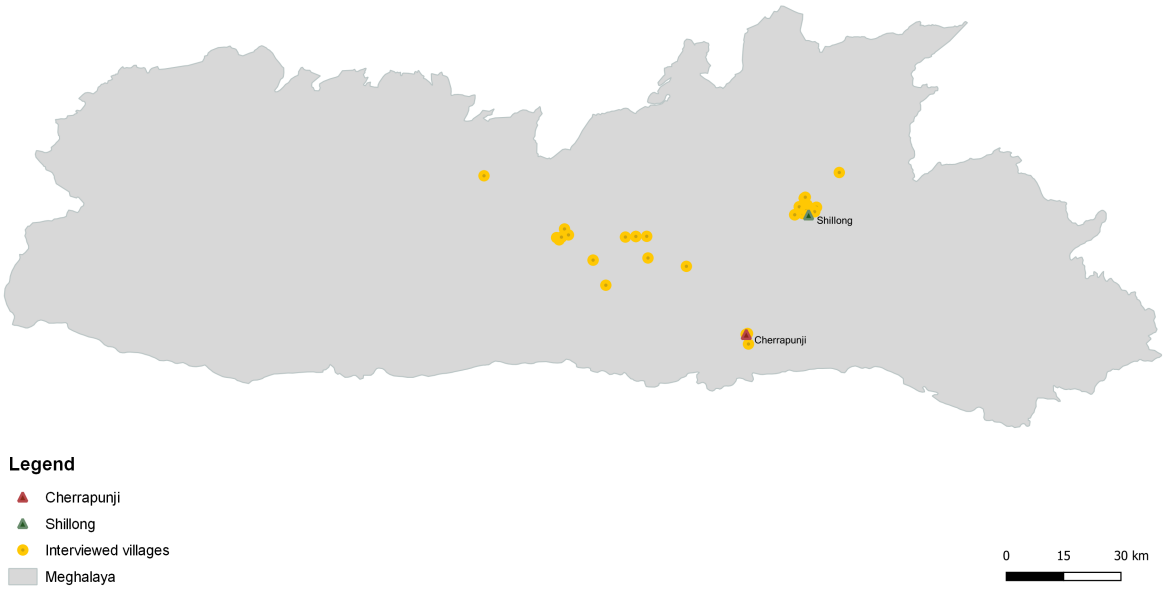
## 4.1 Data sources

We use two data sources in our empirical analysis. First, microdata on financial decisions, sociodemographic characteristics and female empowerment were collected for the special purpose of this study in the three Khasi districts of Meghalaya (East Khasi Hills, West Khasi Hills, and RiBhoi) and, second, the Village and Town Census of India of 2011, which contains information on infrastructural characteristics at the village and town level. For the self-collected data, interviews took place between May and June of 2015 in randomly selected villages. We did a listing of households based on local Census Data, and randomly selected 650 individuals.[3] Field teams visited the households on different days and at different times of the day. If one household was not accessible, we visited the nearest neighbor. The interviewers chose one adult, income-earning member for the interview.[4] The first one was selected by throwing a dice. If 2, 4 or 6 was thrown, a woman was selected, otherwise a male household member was selected for the interview. The gender of the next respondent was then switched e.g. from males to females and so forth. Overall, the dataset is representative of the Khasi population in East Khasi Hills, West Khasi Hills, and Ri Bhoi with a population of about 1.5 million in total, according to the 2011 Indian Census. Figure 1 shows the location of the villages in which the interviews took place, as well as the locations of Cherrapunji and Shillong.

[3]The list of villages in the three districts of Meghalaya (East Khasi Hills, West Khasi Hills and Rhi Boi) was obtained from the Census 2011. The local partner selected 28 villages out of the three districts following systematic random sampling technique. Bigger villages were divided into segments, and segments were selected at random. In total, households come from 81 village segments, in which the surveys were conducted.

[4]In some cases, the youngest daughter, the *Khaddu*, was interviewed in addition. Our results remain the same if we restrict our analysis to only one individual observation per household.

**Figure 1:** Location of interviewed villages in Meghalaya and location of Cherrapunji and Shillong




Own elaboration based on the location of the villages in which the interviews took place and the locations of Cherrapunji and Shillong.

## 4.2 Measurement of variables

### Dependent variables

To measure household financial decisions, we have different variables. First, to capture savings patterns, we ask respondents whether they generally have money left to save at the end of the month. The variable *Savings* takes value one if respondents answer with *yes* and zero otherwise.[5] Second, we ask respondents about monthly expenditures with (i) food and groceries, (ii) education and (iii) temptation goods.[6] Although our main

[5]A natural alternative to our binary savings indicator would be a variable measuring the exact amount saved by respondents. Nevertheless, due to the number of missing observations in our continuous savings variable, we stick to the dummy indicator as our main outcome of interest. Although the binary measure does not allow us to assess the effects of female empowerment on savings at the intensive margin, we can capture the effects at the extensive margin. Additionally, we believe that due to the existence of recall bias, the binary variable could be more precise than the continuous measure.

[6]The variable *Temptation goods* is defined as monthly expenditures with consumption goods such as cigarettes, coffee, etc.

interest lies in understanding the effect of female empowerment on savings, we use the other expenditure variables to shed light on investment and consumption decisions.

### Explanatory variables

To measure female decision power in the household, we consider four different variables: *Short financial decisions female* takes the value one if the respondent states that a female is responsible for taking short-term financial decisions in the household and zero otherwise, *Long financial decisions female* takes the value one if a woman is responsible for long-term financial decisions and zero if the respondent answers that a man is responsible for them, *Female head* equals to one if a woman is the household head and is zero if a man is the household head and *Female land title* takes the value one if the land title is on the name of a female and zero otherwise.

We consider, furthermore, information on risk attitude, competitiveness, self-confidence with financial matters and gambling behavior, as these characteristics can influence investments as well as savings behavior and are often related to gender.[7] We also account for the time preferences of the respondents.[8] In addition, we have a number of sociodemographic and economic controls such as the gender of the respondent, age, marital status, number of children, education, land ownership and income.

Apart from the household and individual controls, we make use of the Village and Town Census of India of 2011 to control for infrastructural and sociodemographic characteristics of the villages, such as total population and road accessibility. The variable *Total population* measures the number of inhabitants in each village or town in 2011 and the variable *Road*

[7]Risk behavior was measured using a standard lottery question. Competitiveness is self-assessed by asking the respondent *"If you play a game is it important for you to win?"*. The respondent can choose between the following answers: *Choice 1: "I absolutely have to win". Choice 2: "I very much like to win". Choice 3: "I'll be happy if I win". Choice 4: "I do not care if I win".* The variable competitiveness takes value one if the respondent opts for the first and second answers and is zero otherwise. Self-confidence assessed with the question "Suppose you are asked to toss a small ball into a small bin 10 feet away. You will have 10 opportunities to toss the ball. How many successful tosses do you think you will make?". The variable takes value one if the respondent says above or equal to 5 successful tosses and 0 otherwise. Gambling behavior is is captured by the number of tries the respondent needs to finish a simple but financially incentivized memory game.

[8]Time preference was assessed with the question "Suppose you have the option to receive 100 INR today or 150 INR three days later. It is sure that you will get the money. What would be your choice?" The variable *shortpreferences* is defined as one if the respondent opts for the first option and zero otherwise.

*access* takes the value one if the respondent lives in a village or town that had access to a major district road in 2011 and zero otherwise.[9] In our robustness checks, we also account for other measures of local development contained in the Village and Town Census, such as the number of public and private primary schools and the number of allopathic hospitals. Our instrumental variables, *Far from Cherrapunji* and *Far from Shillong*, are defined as one if the villages are above the mean distance of 68 (32) kilometers and zero otherwise. In doing so, we use the respondent's zipcodes to calculate the distances.[10]

## 4.3 Descriptive statistics

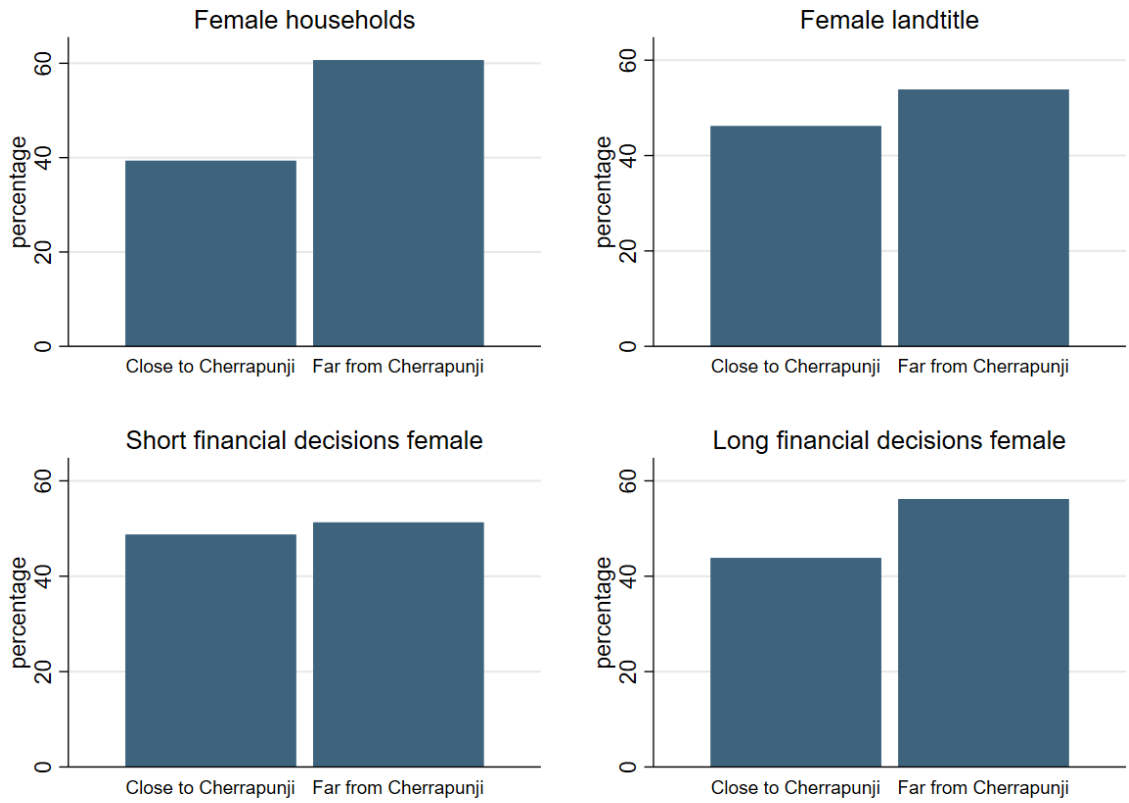
To illustrate the relationship between female empowerment and distance to the historical British base in Cherrapunji, Figure 2 shows the percentage of empowered females in our sample that live far and close to Cherrapunji (above or below the mean of 68 kilometers). Figure 2 shows that the majority of empowered women in our sample live far from the Protestant base, irrespective of the measure of female empowerment we use. For instance, more than 60 percent of households that have a female household head, 55 percent of households in which the land titles are in the name of a woman, 58 percent of households in which a female is responsible for long-term financial decisions and 50 percent of households in which a woman is responsible for short-term financial decisions live far from Cherrapunji. Although being simply correlational, the figure already hints to the relationship between distance to the historical British base and the spatial distribution of matrilineal values.

To check if households living far and close to Cherrapunji also differ in terms of financial decisions, Table 1 shows the group differences in savings and expenditures with food and groceries, education and temptation goods. In Panel A, the differences are calculated using the entire sample, while in Panel B, the differences are calculated with a sample of female respondents. Panel A shows that households who live geographically

[9]To make the Village and Town Census of India compatible, we code the variable *Road access* as one if the village has access to a major district road using question *MajorDistrictRoadStatusA1* and if a town is closer than 10 kilometers to a major district road using question *DistrictHQRoadDistancein*.

[10]We also employ a continuous measure of distance. The results are presented in Table A19 in the Appendix. Additionally, we employ an alternative measure of distance which is constructed based on the so-called "friction maps", that take into account the existing connectivity based on infrastructural variables. Results are discussed in Section 6.2.

**Figure 2:** Share of empowered women far and close to Cherrapunji




The figure shows the share of empowered women living far (>68km) and close (<68km) to Cherrapunji, using the four different measures of female empowerment.

far from Cherrapunji save less, spend on average less on temptation goods, and more on education and food. For the female sample, the group expenditures follow a similar pattern, although the differences are not statistically significant. Regarding the differences in household's sociodemographic and economic characteristics, Table A2 in the Appendix shows the average differences in observable characteristics for respondents living far and close to Cherrapunji, also separately for the full sample and the subsample of female respondents. Table A2 reveals that there are no statistically significant differences in income, gender of the respondent, age, financial accessibility and knowledge. We do see, however, statistically significant differences in land ownership, education, competitiveness and family composition. We expect the differences in marriage patterns, number of children and competitiveness charateristics to be related to the social norms introduced by the British mission. Therefore, we control for all the variables in our regression specifications.

**Table 1:** Savings and expenditures depending on the distance to Cherrapunji

| **Panel A: Male and female respondents** | | | | | | |
|---|---|---|---|---|---|---|
| | *Close to Cherrapunji* | | *Far from Cherrapunji* | | *Difference* | |
| | mean | sd | mean | sd | b | t |
| Savings | 0.43 | 0.50 | 0.37 | 0.48 | 0.07 | 1.69 |
| Food expenditure | 4294.39 | 2488.26 | 4661.10 | 2309.45 | -366.71 | -1.93 |
| Education expenditure | 2175.66 | 2405.23 | 2728.98 | 6518.47 | -553.33 | -1.24 |
| Temptation goods | 680.25 | 750.14 | 618.58 | 756.03 | 61.68 | 0.97 |
| Observations | 338 | | 303 | | 641 | |
| **Panel B: Female respondents** | | | | | | |
| | *Close to Cherrapunji* | | *Far from Cherrapunji* | | *Difference* | |
| | mean | sd | mean | sd | b | t |
| Savings | 0.37 | 0.49 | 0.37 | 0.48 | 0.01 | 0.11 |
| Food expenditure | 4291.62 | 2367.50 | 4445.08 | 2074.07 | -153.46 | -0.63 |
| Education expenditure | 2172.67 | 2272.13 | 2675.49 | 6416.26 | -502.82 | -0.85 |
| Temptation goods | 740.91 | 882.55 | 644.16 | 752.47 | 96.75 | 1.02 |
| Observations | 179 | | 160 | | 339 | |

Table 2 reports the descriptive statistics for all variables used in our regressions. The table shows that, in our sample, 49 percent of households state that a female is responsible for short-run financial decisions, 53 percent report that a female is responsible for long-term financial decisions, 69 percent of land titles are in the name of a woman and 10 percent of households state that a female is the household head.[11] As for the demographic composition of the sample, the table shows that 53 percent of the respondents are female, 52 percent of respondents are married, respondents are on average 29 years old and have on average 2 children. The household average monthly income is 9228 INR, which corresponds to approximately USD 132. The average education level is 5, which corresponds to middle school. Among the variables reflecting the respondents personality traits, Table 2 shows that 91 percent of the sample respondents are rather risk averse, 65 percent can be considered as being competitive and 57 percent have short term preferences. The table also shows that 69 percent of respondents live in villages that have access to a major road and the average village population is 50603 inhabitants. In addition, 47

[11] Among the Khasis, although women typically act as the household head, often the oldest uncle – brother of the mother, is considered to be the household head, which is rooted in the culture. Thus, the Khasis have a different understanding of the notion of household head, which is not directly comparable to patrilineal societies.

percent of our sample live far from Cherrapunji and 35 percent live far from Shillong.

# 5 Empirical analysis

In order to investigate the effect of female empowerment on financial decision making, we start by estimating a linear probability model. Our baseline regression model is defined as:

$$Financialdecision_{ihv} = \beta_0 + \beta_1 Empowerment_h + \delta_1 X_{ih} + \theta_1 V_v + \epsilon_i \tag{1}$$

Where the subscripts $i$, $h$ and $v$ in Equation (1) denote individual, household and village, respectively. Our main measure of financial decision is the dummy variable *Savings*. However, to investigate the underlying channels, we also use the other expenditure variables as alternative outcomes i.e., *Education expenditure*, *Food expenditure* and *Temptation goods*. Our main explanatory variables of interest are the four measures of female empowerment, which are regressed separately: *Short financial decisions female*, *Long financial decisions female*, *Female head* and *Female land title*. $X$ is a vector of individual and household characteristics including age, age squared, a dummy for whether the individual is married, a dummy for whether the respondent is female, number of children in the household, respondent's education level, a dummy for whether the individual owns land, respondent's income, a dummy for whether the respondent has a bank account and indicator variables for financial literacy and personality traits. $V$ includes control variables at the village level, such as village or town population.

As female empowerment is endogenous to unobservable household and individual characteristics, in a second step we estimate a Two-Stage Least Squares (2SLS) model using the distance to the former British base in Cherrapunji (or Shillong) as an instrument for female empowerment. Our model is estimated as follows.

$$Empowerment_{ihv} = \alpha_0 + \alpha_1 Distance_v + \phi_1 X_{ih} + \zeta_1 V_v + \mu_i \tag{2}$$

$$Financialdecision_{ihv} = \zeta_0 + \zeta_1 \widehat{Empowerment}_{ihv} + \eta_1 X_{ih} + \rho_1 V_v + \iota_i \tag{3}$$

**Table 2:** Descriptive statistics

| | mean | sd | min | max |
|---|---|---|---|---|
| **Empowerment variables** | | | | |
| Female head | 0.10 | 0.29 | 0.00 | 1.00 |
| Female land title | 0.69 | 0.46 | 0.00 | 1.00 |
| Short financial decisions female | 0.49 | 0.50 | 0.00 | 1.00 |
| Long financial decisions female | 0.53 | 0.50 | 0.00 | 1.00 |
| **Instrumental variables** | | | | |
| Far from Cherrapunji | 0.47 | 0.50 | 0.00 | 1.00 |
| Far from Shillong | 0.35 | 0.48 | 0.00 | 1.00 |
| **Outcome variables** | | | | |
| Savings | 0.40 | 0.49 | 0.00 | 1.00 |
| Temptation goods | 648.76 | 753.12 | 50.00 | 6000.00 |
| Education expenditure | 2454.02 | 4927.26 | 50.00 | 50000.00 |
| Food Expenditure | 4467.73 | 2410.50 | 5.00 | 15000.00 |
| **Village controls** | | | | |
| RoadAccess | 0.69 | 0.46 | 0.00 | 1.00 |
| Total population | 50603.97 | 56773.47 | 0.00 | 143229.00 |
| **Individual controls** | | | | |
| Female | 0.53 | 0.50 | 0.00 | 1.00 |
| Age | 29.05 | 10.21 | 15.00 | 60.00 |
| Squared age | 948.33 | 706.63 | 225.00 | 3600.00 |
| Married | 0.52 | 0.50 | 0.00 | 1.00 |
| Number of children | 2.25 | 1.89 | 0.00 | 11.00 |
| Education | 5.49 | 2.19 | 1.00 | 11.00 |
| Own land | 0.65 | 0.48 | 0.00 | 1.00 |
| Income | 9228.16 | 7271.95 | 2.00 | 60000.00 |
| Computations | 0.75 | 0.43 | 0.00 | 1.00 |
| Knows interest rate | 0.83 | 0.37 | 0.00 | 1.00 |
| Knows bank deposit | 0.65 | 0.48 | 0.00 | 1.00 |
| Self confidence | 0.53 | 0.50 | 0.00 | 1.00 |
| Risk aversion | 0.91 | 0.28 | 0.00 | 1.00 |
| Memory game | 15.70 | 4.61 | 7.00 | 36.00 |
| Short preferences | 0.57 | 0.50 | 0.00 | 1.00 |
| Competitive | 0.65 | 0.48 | 0.00 | 1.00 |
| Observations | 641 | | | |

Where Equations (2) and (3) show the first stage and the second stage, respectively. Our main instrumental variable *Far from Cherrapunji* is a dummy which equals to one if the household lives in a village which is above the mean distance of 68 kilometers and zero otherwise. Alternatively, we use the variable *Far from Shillong* which equals to one if the household lives above the mean distance of 32 kilometers and zero otherwise.[12]

Two main assumptions underlie our IV estimator. First, the closer the Khasis live to Cherrapunji or Shillong, the more they have been exposed to (the legacies of) male-centered decision-making structures of the British and the less likely they are to stick to their matrilineal Khasi tradition. Consequently, we expect females to be more empowered the farther they live from these two places. Existing experimental studies have documented behavioral differences of women in matrilineal societies (e.g., Gneezy *et al.* (2009); Asiedu and Ibanez (2014); Lowes (2017)). Females who live nearer the historical British base are expected to behave more like women living in a patrilineal environment, thus less empowered than the Khasi women living further away. In our analysis, we exploit variation in exposure to matrilineal values to test whether fully empowered women also differ in terms of financial decisions. Second, the distance to Cherrapunji and Shillong only affects expenditure decisions through female empowerment. While we can test directly for the relevance of our instruments using the first-stage results, arguing for the exclusion restriction requires additional effort. In what follows, we discuss our strategies to reduce concerns with the excludability of our instruments.

There are two main threats to our identification strategy. First, it is possible that proximity to the Protestant missions affects financial decisions through channels other than female empowerment. Second, the fact that the location of the British Protestant missions might have not been random raises the question of whether the results are driven by other confounding factors that persisted over time. To reduce these concerns, we consider a number of aspects. We exploit variation within three districts of Meghalaya, which consists in a relatively homogeneous environment, both in terms of social norms,

[12]We also report the results of the regressions using both instruments in the same specification and the variable measuring the continuous distance.

geographic conditions and institutional characteristics. To ensure that our results are not driven by alternative channels, we control for a wide range of individual, household and village characteristics. In addition to the standard sociodemographic and economic controls, the survey includes many questions on personality traits, financial literacy and access to financial institutions. In our robustness checks, we also include a range of contemporary measures of local development, such as the number of schools, hospitals and road accessibility, to ensure that our results are not driven by confounding factors. To attenuate concerns that our results are not driven by remoteness, in an additional exercise we also control for the village's connectivity to markets based on infrastructural characteristics and friction maps. Additionally, several papers in the literature discuss the possibility that there was a positive selection of mission locations, in terms of economic development (Mantovanelli, 2014; Castelló-Climent *et al.*, 2017; Jedwab *et al.*, 2018; Calvi and Mantovanelli, 2018). However, if this were the case, we would expect to find more gender equality around the Protestant missions, as there is a well-documented association between economic development and gender equality. Differently from many papers that found positive long-run effects of Christian missions on economic outcomes (Becker and Woessmann, 2008; Nunn, 2014; Mantovanelli, 2014; Calvi and Mantovanelli, 2018; Valencia Caicedo, 2019) in the case of Meghalaya, proximity to the British mission is associated with the dilution of matrilineal values, which ended up reducing female empowerment. All in all, a positive selection in mission locations would give us lower bound estimates. While we cannot control for potential migratory movements, such as the Khasis moving from other parts of the state to Cherrapunji, we know that family boundaries and matrilocality are strong elements of the Khasi culture and that family members typically stay geographically close. Thus, is not likely that migratory movements could drive our results completely.

Overall, our identification strategy relates to a growing literature investigating the effects of proximity to historical institutions on contemporary outcomes (Becker and Woessmann, 2009; Castelló-Climent *et al.*, 2017; Lowes, 2017, 2018; Calvi and Mantovanelli, 2018; Mantovanelli, 2013, 2014; Valencia Caicedo, 2019). More precisely, it follows the

well-known examples of Becker and Woessmann (2009) and Nunn (2008), who also use the degree of historical exposure (approximated by distance) to investigate how they shape long-term economic development.

# 6 Results

This section presents the results of regression models 1, 2 and 3 on the relationship between female empowerment and household financial decisions. We start by presenting the results of the OLS regressions and then proceed to the IV results. Additionally, we present a subsection with robustness checks and potential transmission channels.

## 6.1 Main results

### Female empowerment and savings

Table 3 shows the results of the estimation of model (1) on the relationship between female empowerment and savings. In Table 3, the outcome variable is binary and equals to one if respondents state that they have savings left at the end of the month and zero otherwise. Columns (1) to (4) show the results using the four different measures of female empowerment. Although purely correlational, the results show a negative relationship between female empowerment and savings. Column (1) of Table 3 shows that households where a female is responsible for short-term financial decisions are 8.8 percentage points less likely to have savings left at the end of the month. Similarly, in column (3), we estimate that households that have a female household head are 13.8 percentage points less likely to save. The results using the other two measures of female empowerment are also negative, but statistically insignificant.

As discussed in detail in the previous section, since female empowerment is endogenous, our OLS coefficients are most likely biased. In what follows, we present the results of our 2SLS model using the distance to Cherrapunji as an IV for female empowerment. The results of the two stages are presented in Table 4, once more with the binary savings

**Table 3:** Female empowerment and savings: LPM

| | Savings | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Short financial decisions female | -0.088* | | | |
| | (0.05) | | | |
| Long financial decisions female | | -0.065 | | |
| | | (0.05) | | |
| Female head | | | -0.138** | |
| | | | (0.06) | |
| Female land title | | | | -0.039 |
| | | | | (0.04) |
| Mean of Savings | 0.41 | 0.41 | 0.41 | 0.41 |
| Number of Observations | 624 | 624 | 624 | 624 |
| Controls | ✓ | ✓ | ✓ | ✓ |

*Notes:* Linear probability model (LPM) estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy variable which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1), a dummy variable measuring whether a female is responsible for short-term financial decisions, in column (2), a dummy variable measuring whether a female is responsible for long-term financial decisions, in column (3), a dummy variable measuring whether a female is the household head and in column (4), a dummy variable measuring whether the land title is in the name of a female. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presenting also the estimations of the controls, is presented in Table A3 in the Appendix.

variable as the outcome. As it can be seen in the table, the instrument is relevant for three measures of female empowerment: *Short financial decisions female*, *Long financial decisions female* and *Female land title*, but not for *Female head*.[13] In all three cases, the first-stage F-statistic is above the conventional threshold of 10 (Steiger and Stock, 1997). The first-stage regression reveals that being close to Cherrapunji reduces female empowerment. The results are not only statistically significant, but also large in magnitude. Being far from Cherrapunji reduces the probability of having a female responsible for short-run (long-run) financial decisions by 41.7 (46.8) percentage points and the probability of having land titles in the name of a woman by 22.4 percentage points.

[13]Since in the traditional Khasi society there is a clear division of roles with men being responsible for religious and farm activities and women inheriting land and taking the financial decisions, we acknowledge that the household head variable might contain some measurement error. The descriptive statistics show that only 10% of households state that a female is the household head. However, once asked about female responsibility for short and long-run financial decisions and land ownership, the percentage is much higher. This might indicate that the variable *female household head* is underestimated.

Coming to the second-stage results, Table 4 shows that female empowerment reduces significantly the probability that households have savings left at the end of the month. In columns (1) and (2) of Table 4, we estimate that having a female responsible for short-run (long-run) financial decisions reduces the probability of having savings left at the end of the month by 63.7 (56.9) percentage points. The results are not only statistically significant, but also economically meaningful, considering the baseline savings in our sample which equals to 41%. All in all, the comparison between the OLS and the IV results reveals that the OLS coefficients are severely downward biased. This result is not entirely surprising if we consider that female empowerment is most likely related with unobservable cognitive and economic abilities which are also expected to be positively related with savings. Since we find a negative relationship between female empowerment and savings, the presence of this omitted variables is expected to downward bias the OLS coefficients.

**Table 4:** Female empowerment and savings: IV

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.637*** | | | | | | | |
| | (0.16) | | | | | | | |
| Long financial decisions female | | | -0.569*** | | | | | |
| | | | (0.15) | | | | | |
| Female head | | | | | -4.573 | | | |
| | | | | | (2.82) | | | |
| Female land title | | | | | | | -1.186*** | |
| | | | | | | | (0.42) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Mean of Savings | 0.41 | | 0.41 | | 0.41 | | 0.41 | |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 27.57 | | 30.93 | | 1.89 | | 15.02 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presenting also the estimations of the controls, is presented in Table A4, in the Appendix.

In addition, we also include the second instrument, *Distance to Shillong*, in our regressions as reported in Table 5. Although slightly smaller than before, the first-stage F-statistics are above the threshold of 10. One should note, however, that despite the large first-stage F-statistics, the *Far from Shillong* coefficients are positive, but not statistically

significant, which could potentially be explained by the correlation between the two distance measures (0.56). The *Far from Cherrapunji* coefficients are highly significant and large in magnitude. Regarding the second stage results, Table 5 shows that female empowerment decreases the probability that households have savings left at the end of the month. For example, households in which a female is responsible for short-run financial decisions are 79.4 percentage points less likely to have savings left at the end of the month, compared to households in which a male is responsible for the short-run financial decisions.

**Table 5:** Female empowerment and savings: IVs distance to Cherrapunji and distance to Shillong

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.749*** | | | | | | | |
| | (0.13) | | | | | | | |
| Long financial decisions female | | | -0.693*** | | | | | |
| | | | (0.12) | | | | | |
| Female head | | | | | -5.560 | | | |
| | | | | | (3.45) | | | |
| Female land title | | | | | | | -1.502*** | |
| | | | | | | | (0.38) | |
| Far from Cherrapunji | | 0.393*** | | 0.433*** | | 0.022 | | 0.203*** |
| | | (0.12) | | (0.11) | | (0.03) | | (0.05) |
| Far from Shillong | | 0.040 | | 0.057 | | 0.059 | | 0.035 |
| | | (0.09) | | (0.07) | | (0.04) | | (0.05) |
| Mean of Savings | 0.41 | | 0.41 | | 0.41 | | 0.41 | |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 15.24 | | 17.06 | | 1.43 | | 7.50 | |
| F-statistic | | 13.86 | | 23.68 | | 1.49 | | 11.85 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The two instrumental variables used are a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not and an instrumental variable that measures if the households live far from Shillong (>32km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presentinf also the estimation of the controls, is presented in Table A5, in the Appendix.

Overall, the results presented in this section indicate that households where females are responsible for economic and financial decisions by culture and where this role is learned from early childhood are less likely to have savings left at the end of the month. We argue that our instrument allows us to deal with endogeneity problems arising from omitted variable bias and to estimate unbiased female empowerment coefficients. One natural question is whether the observed differences in savings patterns is explained by differences in consumption decisions, which we investigate in the next section.

**Female empowerment and consumption decisions**

We now turn to the investigation of possible underlying channels that could explain the savings pattern we find in the previous regressions. Our main objective is to investigate if empowered females save less due to differences in consumption and expenditure choices i.e., (i) expenditures with food and groceries, (ii) education expenditures and (iii) expenditures with temptation goods. In all estimations, we use the distance to Cherrapunji as an IV for the different measures of female empowerment. Tables 6, 7 and 8 present our results.

In Table 6, the outcome variable is the monthly expenditure with food and groceries. Columns (1), (2) and (3) indicate that, irrespective of which measure we take, female empowerment increases monthly expenditures with food related products. We estimate that households in which a female is responsible for short-run (long-run) financial decisions spend on average 2834 (2529) INR more on food and groceries. Additionally, households in which the land titles are in the name of a woman spend on average 5273 INR more with food. These results are sizable, particularly if we consider the baseline food expenditure which corresponds to 4466.86 INR.

Table 7 shows the results using the monthly expenditures with education as the outcome variable. Our sample is substantially smaller. Although the sign of the coefficients is in line with our previous results on food expenditure – higher female empowerment and higher education expenditures – they are estimated very imprecisely and are statistically insignificant. For expenditures with temptation goods, the estimated coefficients are very small in magnitude and insignificant. However, due to the change in the sample size, the comparability with the previous results is restricted.

Overall, the results presented in this section corroborate the hypothesis that fully empowered females spend more on welfare-enhancing goods and save less. Our results are in line with Doepke and Tertilt (2019) who find evidence that cash transfers to women cause an increase in expenditures with welfare enhancing goods at the expense of savings. As highlighted by the authors, these results have important implications for human and physical capital accumulation and long economic growth, although the final effect depends

**Table 6:** Female empowerment and food expenditure: IV

| | Food Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 2834.467*** | | | | | | | |
| | (1052.20) | | | | | | | |
| Long financial decisions female | | | 2529.733*** | | | | | |
| | | | (910.00) | | | | | |
| Female head | | | | | 20343.501 | | | |
| | | | | | (16000.15) | | | |
| Female land title | | | | | | | 5273.998** | |
| | | | | | | | (2539.93) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Mean of Food Expenditure | 4466.86 | | 4466.86 | | 4466.86 | | 4466.86 | |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 27.57 | | 30.93 | | 1.89 | | 15.02 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditures with food and groceries. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presenting also the estimations of the controls, is presented in Table A6, in the Appendix.

on country's productive structures.

## 6.2 Robustness checks

In order to test the robustness of our results and the validity of our instruments, we conduct several additional checks. As discussed in the previous sections, one natural concern with our instrumental variable is that the distance to the historical mission could affect financial decisions through channels other than female empowerment, which would violate the exclusion restriction. To attenuate these concerns, we implement different strategies. First, using data from the Village and Town Census of India, we regress alternative specifications in which we explicitly control for contemporary measures of local development. This reduces concerns that our female empowerment coefficients are capturing differences in long-term development driven by exposure to the British missions. Since, as discussed before, the missions were historically responsible for providing some local public goods, we are particularly interested in closing this channel.[14] In each of the regressions, we control

[14]We acknowledge, however, that the contemporary local development measures could be bad controls in case they are directly affected by the mission. This is the reason why we stick to our main specifications and include these results as additional evidence.

**Table 7:** Female empowerment and education expenditure: IV

| | Education Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 3384.980 | | | | | | | |
| | (2591.00) | | | | | | | |
| Long financial decisions female | | | 2977.889 | | | | | |
| | | | (2270.46) | | | | | |
| Female head | | | | | 48595.886 | | | |
| | | | | | (81646.54) | | | |
| Female land title | | | | | | | 5809.211 | |
| | | | | | | | (4135.27) | |
| Far from Cherrapunji | | 0.381*** | | 0.433*** | | 0.027 | | 0.222*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.06) |
| Mean of Education Expenditure | 2454.99 | | 2454.99 | | 2454.99 | | 2454.99 | |
| Number of Observations | 477 | 477 | 477 | 477 | 477 | 477 | 477 | 477 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 22.44 | | 23.42 | | 0.42 | | 11.72 | |
| F-statistic | | 16.90 | | 24.28 | | 0.46 | | 15.56 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditures with education. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presenting also the estimations of the controls, is presented in Table A7, in the Appendix.

separately for (i) the number of public or (ii) private primary schools, (iii) the number of allopathic hospitals and (iv) road accessibility. The results are presented in Tables A9, A10, A11 and A12 in the Appendix. Reassuringly, our results indicate that, irrespective of which measure of local economic development we include, our female empowerment coefficients remain similar, both in terms of magnitude and statistical significance.[15]

Second, to account for potential effects of village's remoteness, we include an alternative specification in which we control for the connectivity of the villages to two main markets in the region, Shillong and Guwahati, calculated using the so-called "friction maps".[16] We also construct a new continuous measure of distance to Cherrapunji, *Distance to Cherrapunji friction*, which we use as an IV for female empowerment. These two measures are illustrated in Figure 3 and the regression results are presented in Table 9. Overall, the results indicate that our female empowerment coefficients are robust to controlling for village's overall connectivity to markets, which gives us confidence that our estimates are

[15]Due to the relatively high correlation between the different measures of local development, we include the variables separately.

[16]The variable measuring the distance to the markets, *Overall distance to markets*, is calculated based on the existing infrastructure connecting the villages to one of the two main markets in the region, namely Shillong and Guwahati.

**Table 8:** Female empowerment and temptation goods expenditure: IV

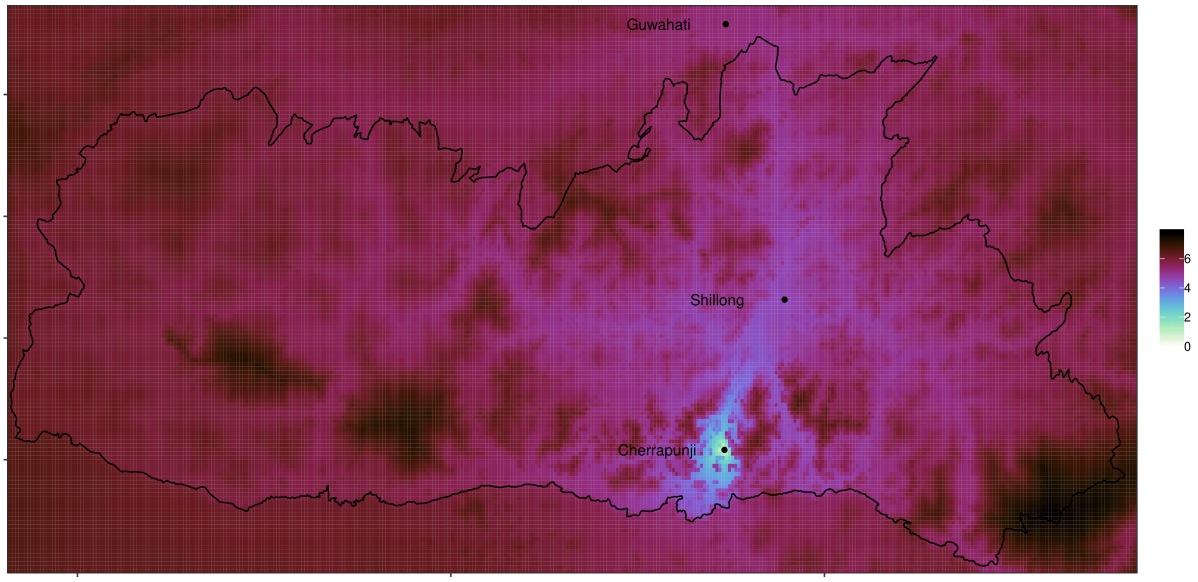
| | Temptation Goods | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 36.797 | | | | | | | |
| | (332.25) | | | | | | | |
| Long financial decisions female | | | 32.581 | | | | | |
| | | | (294.24) | | | | | |
| Female head | | | | | 381.231 | | | |
| | | | | | (3261.72) | | | |
| Female land title | | | | | | | 75.538 | |
| | | | | | | | (674.79) | |
| Far from Cherrapunji | | 0.414*** | | 0.467*** | | 0.040 | | 0.202*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Mean of Temptation Goods | 643.74 | | 643.74 | | 643.74 | | 643.74 | |
| Number of Observations | 551 | 551 | 551 | 551 | 551 | 551 | 551 | 551 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 25.47 | | 28.94 | | 0.79 | | 11.37 | |
| F-statistic | | 16.07 | | 25.19 | | 0.85 | | 23.02 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditure with temptation goods. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. The full table, presenting also the estimations of the controls, is presented in Table A8, in the Appendix.

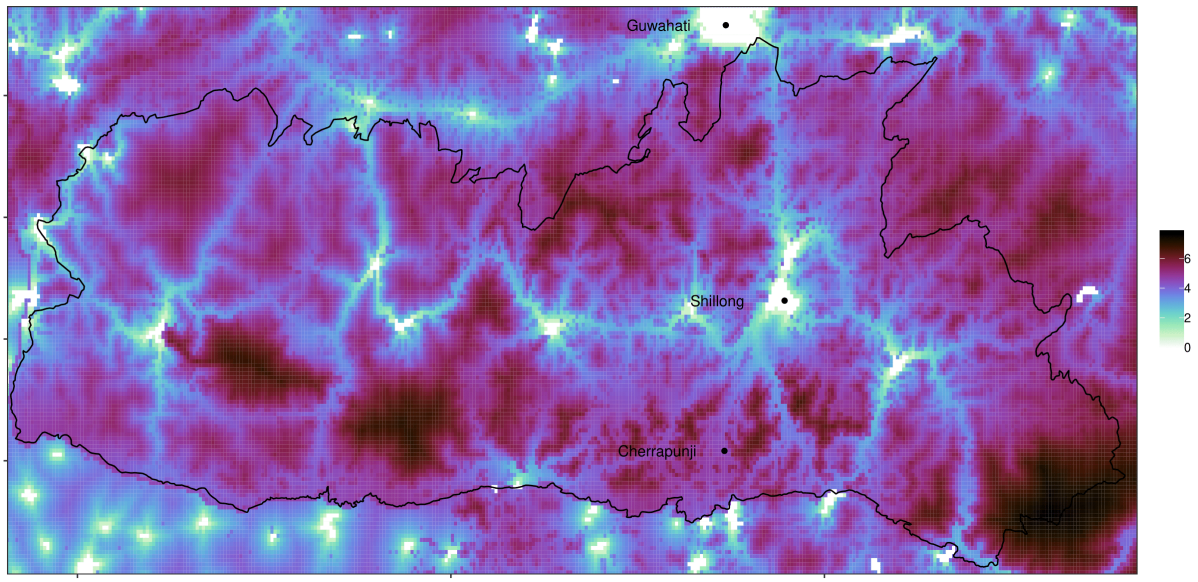
not driven by remoteness.

We also present evidence that our results are robust to different model and variable specifications. For instance, our results hold if we use expenditures per household member or per child as alternative outcome variables (Tables A13 and A14 in the Appendix). Our results are also robust to controlling for the number of household members (Table A15), accessibility to loans, microcredit and mobile banking (Table A17) and respondent's occupation (Table A18). To account for potential outliers, we also present results using the log of expenditures as alternative outcome variables (see Table A16). While for food expenditures the results remain very similar, the empowerment coefficients become negative and marginally significant for education. Lastly, Table A19 shows the results using the continuous distance to Cherrapunji as an alternative instrument for female empowerment. Although the revelance of the instrument is lower, the results point to the same direction as the ones using the binary distance variable *Far from Cherrapunji*.

**Figure 3:** Distance to Cherrapunji and overall distance to markets




(a) Distance to Cherrapunji




(b) Overall distance to two main markets in the region, Shillong and Guwahati

## 6.3 Potential transmission channel

In this section, we investigate the role of infrastructural development as a potential transmission channel that could explain the diffusion of values of the Protestant British missions in Meghalaya. Figures A2 and A3 from the Constable's Hand Atlas of India (1893) show, respectively, the location of all Christian missions in India, as of 1893, and the availability of railways, telegraphs and navigable canals in the country during the

**Table 9:** Female empowerment and financial decisions: IV Controlling for the overall distance to markets

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -1.091*** | | | | | | | |
| | (0.42) | | | | | | | |
| Long financial decisions female | | | -0.705*** | | | | | |
| | | | (0.26) | | | | | |
| Female head | | | | | -2.684* | | | |
| | | | | | (1.43) | | | |
| Female land title | | | | | | | -1.615** | |
| | | | | | | | (0.79) | |
| Distance to Cherrapunji friction | | 0.005** | | 0.008*** | | 0.002** | | 0.003 |
| | | (0.00) | | (0.00) | | (0.00) | | (0.00) |
| Overall distance to markets | 0.005 | 0.011*** | 0.002 | 0.014*** | 0.000 | 0.003** | -0.008** | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 6.88 | | 14.83 | | 5.29 | | 3.96 | |
| F-statistic | | 7.42 | | 22.10 | | 5.25 | | 2.68 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable measures the distance to Cherrapunji considering a friction map that captures the existing transporting network and geographical barriers. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population. Additionally, we also control for the proximity to markets in the region with the variable Travel minutes in general.

same period. What is noticeable from the second map is that, already in 1893, Shillong and Cherrapunji, the main hubs of Protestant missions in Meghalaya, were connected via the telegraph, and railways were being constructed around Cherrapunji. Our hypothesis is that the subsequent infrastructural development around those centers facilitated the diffusion of values in nearby locations, while locations that were farther away remained more isolated from those cultural influences. We test this hypothesis in two steps.

First, using the information on road accessibility contained in the Village and Town Census of India of 2011, we regress our four measures of female empowerment on road accessibility. We control for a set of individual and household characteristics that most likely determine female empowerment such as age, squared age, a dummy for whether the respondent is married, number of children, education level, a dummy for whether the respondent owns land, income, a dummy for whether the respondent is female and a dummy for whether the individual has access to media (as measured by whether individuals frequently read newspapers). Table 10 shows the results. As it can be seen in columns (1) to (4), access to roads has a negative and statistically significant effect on female empowerment. We estimate that households that live in a village that has access to a major district road have approximately 23 percentage points lower probability of having a

female responsible for short-term financial decisions, 28 percentage points lower probability of having a female responsible for long-term financial decisions, 11 percentage points lower probability of having a female as a household head and 17 percentage points lower probability of having land titles in the name of a woman. At first, these results appear to be counter-intuitive, as one would expect access to infrastructure to be positively associated with gender equality. In the context of Meghalaya, however, the results are in line with the hypothesis that being far from Cherrapunji contributed for the preservation of the traditional Khasi values and matrilineal social norms. Although one should refrain from making causal interpretations of the results presented in Table 10, they are in line with the idea that infrastructural development is a potential channel explaining the diffusion of social values around the Protestant Missions.

Second, we use the road accessibility variable as an alternative instrument for female empowerment to investigate its effects on household financial decisions. The results are presented in Table 11. As it can be seen in columns (1), (2) and (4), road accessibility is a good predictor for female empowerment, as seen by the high first-stage F-statistics. Although the results should be interpreted with caution, as road accessibility could also be determined by unobserved factors other than the establishment of the British mission in Cherrapunji, they indicate that the transmission of values through infrastructural development is a plausible underlying channel. All in all, the results presented in this section corroborate the hypothesis that, in the context of Meghalaya, the establishment of Protestant British Missions and subsequent infrastructural developments were associated a shift in traditional matrilineal values.

# 7 Discussion and conclusion

This study provides new empirical evidence on the effect of female empowerment on household financial decisions. By exploring a historical shift in social values caused by the arrival of Protestant British missions in the matrilineal state of Meghalaya, we are able to identify the effect of female empowerment on intra-household savings and consumption

**Table 10:** Female empowerment and road accessibility

| | Female empowerment | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Road access | -0.232*** | -0.286*** | -0.111*** | -0.178*** |
| | (0.08) | (0.08) | (0.03) | (0.03) |
| Age | 0.024 | 0.016 | 0.027*** | -0.029** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Squared age | -0.000* | -0.000 | -0.000 | 0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.360*** | -0.332*** | -0.218*** | -0.064* |
| | (0.05) | (0.03) | (0.04) | (0.03) |
| Number of children | -0.048*** | -0.044** | -0.013*** | -0.021** |
| | (0.01) | (0.02) | (0.00) | (0.01) |
| Education | 0.001 | 0.011 | -0.007 | 0.015*** |
| | (0.02) | (0.02) | (0.01) | (0.01) |
| Own land | -0.191** | -0.156** | -0.025 | 0.165** |
| | (0.07) | (0.07) | (0.02) | (0.06) |
| Income | 0.000 | 0.000 | -0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Female | 0.106** | 0.061 | 0.195*** | 0.150*** |
| | (0.05) | (0.05) | (0.05) | (0.03) |
| Newspaper | 0.030 | 0.048 | -0.031* | 0.069** |
| | (0.04) | (0.04) | (0.02) | (0.03) |
| Observations | 506 | 506 | 506 | 506 |
| $R^2$ | 0.219 | 0.187 | 0.283 | 0.174 |

*Notes:* Robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female.

decisions. By including a range of individual and household controls and accounting for other potential channels using local development indicators, we are confident that our results are not driven by omitted variables of alternative explanations. While most of the existing literature focuses on the effects of *increasing* female's intra-household bargaining power via income transfers, the financial behavior of *fully* empowered females has been relatively overlooked in the literature.

Using new data on female empowerment and financial decisions and implementing a novel identification strategy, our results show that culturally empowered women spend more on welfare-enhancing goods, such as food and groceries, but this comes at the expense

**Table 11:** Female empowerment and savings: IV road accessibility

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.700** | | | | | | | |
| | (0.28) | | | | | | | |
| Long financial decisions female | | | -0.661*** | | | | | |
| | | | (0.24) | | | | | |
| Female head | | | | | -2.987 | | | |
| | | | | | (1.93) | | | |
| Female land title | | | | | | | -1.128*** | |
| | | | | | | | (0.40) | |
| Road access | | -0.455*** | | -0.482*** | | -0.107** | | -0.282*** |
| | | (0.09) | | (0.10) | | (0.04) | | (0.05) |
| Number of Observations | 506 | 506 | 506 | 506 | 506 | 506 | 506 | 506 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 27.14 | | 25.94 | | 4.65 | | 20.76 | |
| F-statistic | | 23.31 | | 22.62 | | 6.09 | | 35.24 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variables used are a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not and an instrumental variable that measures if the households live far from Shillong (>32km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

of savings. While many studies in the development economics literature have investigated the determinants of savings decisions, by focusing both on supply and demand constraints, (e.g., Dupas and Robinson (2013); Karlan and Linden (2014); Steinert *et al.* (2018)), in our case, the focus is on the preferences of culturally empowered women. One question which remains open is what are the long-term effects of female empowerment on long-run growth. As discussed by Doepke and Tertilt (2019) the answer to this question depends precisely on the economy's productive stucture. While for labor abundant countries higher investments in human capital are expected to increase long-run growth, for countries whose economies are mostly dependent on capital and land, higher investments in human capital in detriment of savings are expected to have a negative effect in long-run growth.

Our results contribute to the literature investigating the behavior of economically empowered women (Duflo, 2003; Bobonis, 2009; Ashraf, 2009; Doepke and Tertilt, 2019) and also to the literature investigating the behavior of women in traditional matrilineal societies (Andersen *et al.*, 2013; Asiedu and Ibanez, 2014; Filipiak, 2016; Lowes, 2017, 2018). Our paper also adds to the studies investigating the long-run effects of historical institutions on economic development. While great part of the existing papers documents

positive effects of Christian Missionaries on economic development (Becker and Woessmann, 2008; Nunn, 2014; Mantovanelli, 2014; Calvi and Mantovanelli, 2018; Valencia Caicedo, 2019), we show that, in Meghalaya, proximity to the Protestant British Missions was associated with the dilution of matrilineal values and a decrease in female empowerment. Additionally, our complementary results are consistent with the hypothesis that the modernizing infrastructural developments around the protestant British missions is a plausible channel for the diffusion of Christian values.

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# Appendix

**Table A1:** Description of variables

| Variable | Description |
|---|---|
| Short financial decisions female | A woman in the household is responsible for short-term financial decisions and investments (e.g., saving for children's education in next few months or some consumer durables like bed, chair, tables) |
| Long financial decisions female | A woman in the household is responsible for long-term financial decisions and investments (e.g., buying gold, land) |
| Female head | A woman is the household head |
| Female land title | Household's land title is in the name of a woman |
| Female | Respondent is a woman |
| Age | Age of the respondent in completed years |
| Squared age | Squared age of the respondent |
| Married | Respondent is married |
| Number of children | Number of children currently living in the household |
| Education | Respondent's education: 1:Illiterate; 2:Literate but without formal schooling; 3:Less than primary school; 4:Primary school; 5:Middle school; 6:High school or Matriculate; 7:Higher secondary; 8:Technical education or Diploma; 9:Graduate; 10:Professional degree; 11:Post graduate and above |
| Owns land | Respondent owns land |
| Income | Respondent's monthly income from primary occupation |
| Computations | Respondent answers correctly all the following questions: a) "What is the outcome of 2 + 3?"; b) "What is the outcome of 42 + 35?"; c) "Imagine you have four friends and you would like to give each of them four sweets, how many sweets do you need?"; d) "Suppose you buy a bag of rice that costs INR 85. You give INR 100. How much change will you get back?" |
| Knows interest rate | Knowledge of interest rate is assessed with the question: "If you have INR 100 in a savings account, the interest rate on the account is 10% per year. How much money will you have if you leave the INR 100 on the account one year?" |
| Knows bank deposit | Knowledge of bank deposit is assessed with the question: "Does the government guarantees full deposits at national banks?" |
| Bank account | Respondent has his/her own bank account at a formal institution |
| Risk aversion | Risk-aversion is assessed with a lottery question: "Suppose you have 1000 INR with you, which you want to invest. I am giving you three choices in which you can make this investment as follows: Choice 1: In this choice, after one year your 1000 INR may grow up to 2000 INR, or you may lose some of the money and get back only 500 INR. Choice 2: In this choice after one year your money may grow up to 1200 INR, or you may lose some of the money and get back 800 INR. Choice 3: In this choice, after one year your money will grow to 1050 INR, and you do not lose your deposit at all. Which one would you choose?" The variable risk averse takes on the value one if the respondent opts for option 3 and is zero otherwise |
| Memory game | Number of tries the respondent needs to finish a financially incentivized memory game. |
| Short preferences | Preferences of the respondent are assessed with the question: "Suppose you have the option to receive 100 INR today or 150 INR three days later. It is sure that you will get the money. What would beyour choice?" The variable takes value one if the respondent opts for the first option. |

Continued on next page

**Table A1 – continued from previous page**

| Variable | Description |
|---|---|
| Self confidence | Self-confidence assessed with the question "Suppose you are asked to toss a small ball into a small bin 10 feet away. You will have 10 opportunities to toss the ball. How many successful tosses do you think you will make?". The variable takes value one if the respondent says above or equal to 5 successful tosses and 0 otherwise. |
| Competitive | Competitiveness is assessed with the question "If you play a game is it important for you to win?" the respondent can choose between the following answers: Choice 1: I absolutely have to win. Choice 2: I very much like to win. Choice 3: I'll be happy if I win. Choice 4: I do not care if I win. The variable competitiveness takes value one if the respondent opts for the first and second answers and is zero otherwise. |
| Far from Cherrapunji | Distance to Cherrapunji above the median (68 kilometers). Calculated using respondent's zipcodes. |
| Far from Shillong | Distance to Shillong above the median (32 kilometers). Calculated using respondent's zipcodes |
| Distance to Cherrapunji | Continuous distance to Cherrapunji calculated using respondent's zipcodes |
| Distance to Shillong | Continuous distance to Shillong calculated using respondent's zipcodes |
| Savings | Respondent has money left at the end of the month |
| Temptation goods | Monthly expenditure with consumption goods (cigarettes, coffee, etc) |
| Education expenditure | Monthly expenditure with education |
| Food expenditure | Monthly expenditure with food and groceries |
| Newspaper | Respondent reads frequently the newspaper |
| Spouse earns income | Repondent's spouse earns private income |
| Mobile banking | Respondent uses mobile banking |
| Microcredit | Repondent has micro credit from a micro finance organization |
| Total population | Total population at the village or town |
| Government primary schools | Number of government primary schools at the village or town |
| Private primary schools | Number of private primary schools at the village or town |
| Government middle schools | Number of government middle schools at the village or town |
| Private middle schools | Number of private middle schools at the village or town |
| Allopatic hospitals | Number of allopatic hospitals at the village or town |
| Road access | Village or town has access to a major district road |

**Table A2:** Summary statistics depending on the distance to Cherrapunji

**Panel A: Male and female respondents**

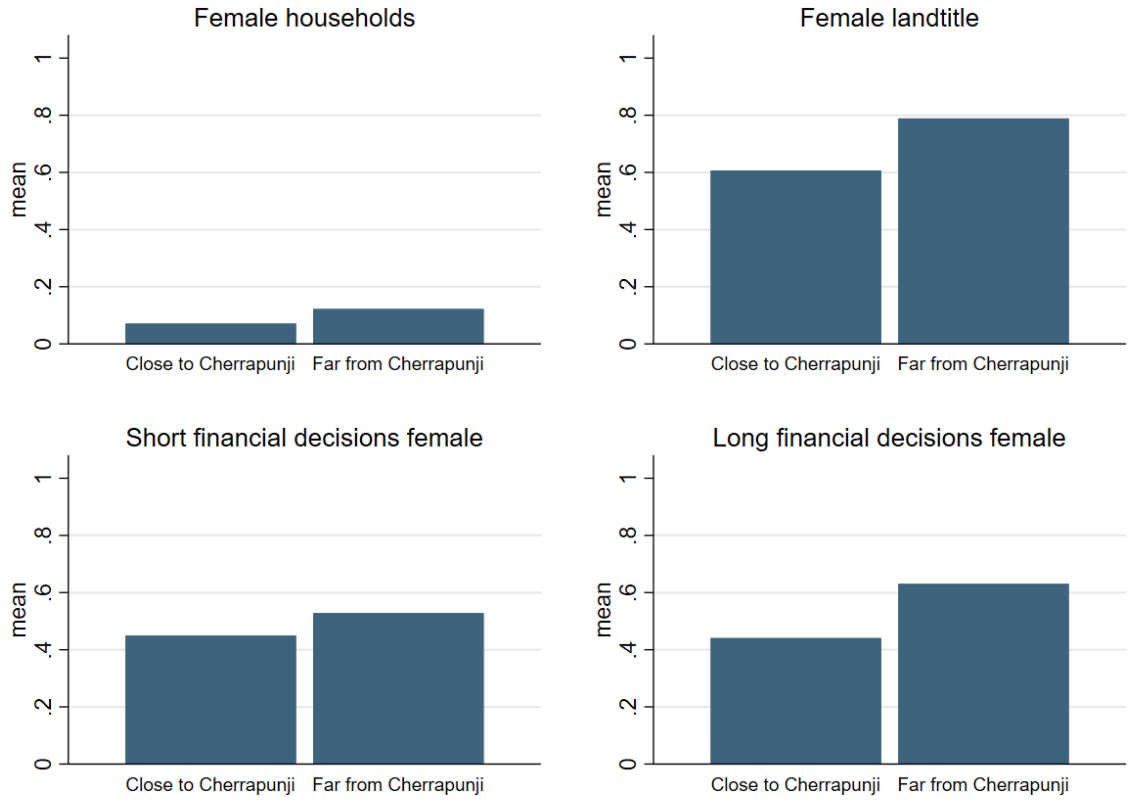
| | *Close to Cherrapunji* | | *Far from Cherrapunji* | | *Difference* | |
|---|---|---|---|---|---|---|
| | mean | sd | mean | sd | b | t |
| Female | 0.53 | 0.50 | 0.53 | 0.50 | 0.00 | 0.04 |
| Age | 29.22 | 10.44 | 28.86 | 9.96 | 0.36 | 0.45 |
| Squared age | 962.85 | 728.75 | 932.13 | 681.96 | 30.72 | 0.55 |
| Married | 0.46 | 0.50 | 0.59 | 0.49 | -0.12** | -3.13 |
| Number of children | 1.75 | 1.61 | 2.82 | 2.03 | -1.07*** | -7.43 |
| Education | 5.99 | 2.03 | 4.93 | 2.23 | 1.06*** | 6.33 |
| Owns land | 0.47 | 0.50 | 0.85 | 0.36 | -0.38*** | -11.09 |
| Income | 9696.05 | 7036.91 | 8708.11 | 7502.29 | 987.93 | 1.70 |
| Computations | 0.75 | 0.43 | 0.76 | 0.43 | -0.00 | -0.13 |
| Knows interest rate | 0.86 | 0.34 | 0.80 | 0.40 | 0.07* | 2.22 |
| Knows bank deposit | 0.61 | 0.49 | 0.69 | 0.46 | -0.09* | -2.30 |
| Bank account | 0.71 | 0.45 | 0.69 | 0.46 | 0.02 | 0.65 |
| Risk aversion | 0.90 | 0.31 | 0.93 | 0.25 | -0.04 | -1.70 |
| Memory game | 16.21 | 4.72 | 15.12 | 4.43 | 1.09** | 3.00 |
| Short preferences | 0.60 | 0.49 | 0.53 | 0.50 | 0.08 | 1.93 |
| Competitive | 0.55 | 0.50 | 0.76 | 0.43 | -0.21*** | -5.74 |
| Observations | 338 | | 303 | | 641 | |

**Panel B: Female respondents**

| | *Close to Cherrapunji* | | *Far from Cherrapunji* | | *Difference* | |
|---|---|---|---|---|---|---|
| | mean | sd | mean | sd | b | t |
| Age | 29.50 | 10.75 | 29.23 | 10.00 | 0.27 | 0.24 |
| Squared age | 985.07 | 754.58 | 953.54 | 683.15 | 31.54 | 0.40 |
| Married | 0.48 | 0.50 | 0.66 | 0.48 | -0.18** | -3.30 |
| Number of children | 1.59 | 1.42 | 3.04 | 2.04 | -1.46*** | -7.71 |
| Education | 6.09 | 2.00 | 5.04 | 2.07 | 1.05*** | 4.76 |
| Owns land | 0.45 | 0.50 | 0.87 | 0.34 | -0.42*** | -8.88 |
| Income | 10013.95 | 6822.09 | 8161.80 | 7317.19 | 1852.16* | 2.38 |
| Computations | 0.74 | 0.44 | 0.74 | 0.44 | -0.01 | -0.13 |
| Knows interest rate | 0.87 | 0.34 | 0.79 | 0.41 | 0.08 | 1.92 |
| Knows bank deposit | 0.58 | 0.50 | 0.68 | 0.47 | -0.11* | -2.02 |
| Bank account | 0.75 | 0.44 | 0.72 | 0.45 | 0.02 | 0.49 |
| Risk aversion | 0.92 | 0.27 | 0.91 | 0.29 | 0.02 | 0.51 |
| Memory game | 16.63 | 4.75 | 15.35 | 4.42 | 1.28* | 2.56 |
| Short preferences | 0.60 | 0.49 | 0.53 | 0.50 | 0.07 | 1.35 |
| Competitive | 0.54 | 0.50 | 0.74 | 0.44 | -0.20*** | -3.91 |
| Observations | 179 | | 160 | | 339 | |

*Notes:* Panel A shows the descriptive statistics for all individuals living close (<68km) and far (>68km) from Cherrapunji. Panel B shows the descriptive statistics for the sample of female respondents living close and far from Cherrapunji.

**Figure A1:** Average female empowerment and distance to Cherrapunji




The figure shows the average female empowerment for locations close (<68km) and far (>68km) from Cherrapunji.

**Table A3:** Female empowerment and savings: LPM - Full table

| | Savings | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Short financial decisions female | -0.088* | | | |
| | (0.05) | | | |
| Long financial decisions female | | -0.065 | | |
| | | (0.05) | | |
| Female head | | | -0.138** | |
| | | | (0.06) | |
| Female land title | | | | -0.039 |
| | | | | (0.04) |
| Female | -0.036 | -0.039 | -0.018 | -0.039 |
| | (0.04) | (0.05) | (0.05) | (0.05) |
| Age | 0.020 | 0.020 | 0.021 | 0.017 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Squared age | -0.000* | -0.000* | -0.000 | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.063 | -0.054 | -0.057 | -0.037 |
| | (0.05) | (0.05) | (0.06) | (0.05) |
| Number of children | -0.026** | -0.026** | -0.025** | -0.024* |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Education | 0.001 | 0.001 | -0.000 | 0.001 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Own land | 0.094 | 0.095 | 0.095* | 0.111* |
| | (0.06) | (0.06) | (0.05) | (0.06) |
| Income | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.098 | 0.094 | 0.094 | 0.097 |
| | (0.07) | (0.07) | (0.07) | (0.07) |
| Knows interest rate | 0.004 | 0.013 | 0.014 | 0.019 |
| | (0.11) | (0.10) | (0.11) | (0.10) |
| Knows bank deposit | 0.031 | 0.030 | 0.028 | 0.020 |
| | (0.06) | (0.06) | (0.06) | (0.07) |
| Bank account | -0.018 | -0.017 | -0.009 | -0.015 |
| | (0.04) | (0.04) | (0.04) | (0.04) |
| Risk aversion | 0.078* | 0.074 | 0.070 | 0.071 |
| | (0.04) | (0.05) | (0.04) | (0.04) |
| Memory game | -0.008* | -0.009* | -0.008* | -0.008* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Short preferences | 0.037 | 0.033 | 0.039 | 0.033 |
| | (0.04) | (0.04) | (0.04) | (0.04) |
| Competitive | 0.062 | 0.065* | 0.066* | 0.062 |
| | (0.04) | (0.04) | (0.04) | (0.04) |
| Total population | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Observations | 624 | 624 | 624 | 624 |

*Notes:* Linear probability model (LPM) estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy variable which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1), a dummy variable measuring whether a female is responsible for short-term financial decisions, in column (2), a dummy variable measuring whether a female is responsible for long-term financial decisions, in column (3), a dummy variable measuring whether a female is the household head and in column (4), a dummy variable measuring whether the land title is in the name of a female.

**Table A4:** Female empowerment and savings: IV - Full table

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.637*** | | | | | | | |
| | (0.16) | | | | | | | |
| Long financial decisions female | | | -0.569*** | | | | | |
| | | | (0.15) | | | | | |
| Female head | | | | | -4.573 | | | |
| | | | | | (2.82) | | | |
| Female land title | | | | | | | -1.186*** | |
| | | | | | | | (0.42) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Female | 0.012 | 0.090*** | -0.006 | 0.068** | 0.802* | 0.185*** | 0.110** | 0.131*** |
| | (0.04) | (0.03) | (0.04) | (0.03) | (0.43) | (0.04) | (0.05) | (0.03) |
| Age | 0.035* | 0.030** | 0.036** | 0.036*** | 0.134* | 0.026** | -0.008 | -0.021 |
| | (0.02) | (0.01) | (0.02) | (0.01) | (0.08) | (0.01) | (0.02) | (0.01) |
| Squared age | -0.001** | -0.000** | -0.001*** | -0.000*** | -0.001 | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.236*** | -0.348*** | -0.201*** | -0.327*** | -0.774 | -0.166** | -0.109 | -0.079** |
| | (0.07) | (0.05) | (0.07) | (0.04) | (0.49) | (0.06) | (0.08) | (0.03) |
| Number of children | -0.038*** | -0.023 | -0.039*** | -0.026 | -0.066*** | -0.009*** | -0.035* | -0.010 |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.02) | (0.00) | (0.02) | (0.01) |
| Education | 0.007 | 0.006 | 0.002 | -0.002 | -0.026 | -0.006 | 0.001 | -0.002 |
| | (0.02) | (0.02) | (0.01) | (0.01) | (0.03) | (0.01) | (0.01) | (0.01) |
| Own land | 0.057 | -0.067 | 0.059 | -0.072 | -0.049 | -0.033 | 0.439*** | 0.286*** |
| | (0.10) | (0.08) | (0.08) | (0.05) | (0.17) | (0.03) | (0.13) | (0.07) |
| Income | 0.000 | 0.000 | 0.000 | -0.000 | -0.000 | -0.000 | 0.000 | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.082 | 0.009 | 0.036 | -0.070 | -0.124 | -0.044*** | -0.010 | -0.073** |
| | (0.07) | (0.04) | (0.08) | (0.05) | (0.15) | (0.02) | (0.08) | (0.03) |
| Knows interest rate | -0.086 | -0.112* | -0.035 | -0.037 | -0.148 | -0.029 | 0.037 | 0.043 |
| | (0.12) | (0.06) | (0.10) | (0.03) | (0.37) | (0.06) | (0.08) | (0.07) |
| Knows bank deposit | 0.112* | 0.103** | 0.120* | 0.129** | 0.347* | 0.066*** | 0.079 | 0.028 |
| | (0.06) | (0.05) | (0.07) | (0.06) | (0.20) | (0.01) | (0.07) | (0.03) |
| Bank account | -0.018 | -0.018 | -0.012 | -0.009 | 0.262 | 0.059*** | 0.065 | 0.061*** |
| | (0.05) | (0.03) | (0.06) | (0.05) | (0.20) | (0.02) | (0.06) | (0.02) |
| Risk aversion | 0.145*** | 0.094 | 0.127* | 0.073 | 0.184 | 0.022 | 0.190*** | 0.088** |
| | (0.04) | (0.07) | (0.07) | (0.06) | (0.13) | (0.03) | (0.06) | (0.03) |
| Memory game | -0.009** | 0.002 | -0.011*** | -0.002 | -0.000 | 0.002 | -0.007 | 0.003 |
| | (0.00) | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.047 | 0.049 | 0.016 | 0.000 | 0.183** | 0.037 | -0.033 | -0.041* |
| | (0.04) | (0.05) | (0.04) | (0.04) | (0.09) | (0.03) | (0.04) | (0.02) |
| Competitive | 0.051 | -0.025 | 0.073 | 0.010 | 0.143 | 0.017 | 0.008 | -0.050 |
| | (0.05) | (0.04) | (0.05) | (0.05) | (0.09) | (0.02) | (0.07) | (0.04) |
| Total population | 0.000 | 0.000*** | -0.000 | 0.000*** | -0.000 | -0.000 | 0.000 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Kleibergen-Paap F-statistic | 27.57 | | 30.93 | | 1.89 | | 15.02 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A5:** Female empowerment and savings: IVs distance to Cherrapunji and distance to Shillong - Full table

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.749*** | | | | | | | |
| | (0.13) | | | | | | | |
| Long financial decisions female | | | -0.693*** | | | | | |
| | | | (0.12) | | | | | |
| Female head | | | | | -5.560 | | | |
| | | | | | (3.45) | | | |
| Female land title | | | | | | | -1.502*** | |
| | | | | | | | (0.38) | |
| Far from Cherrapunji | | 0.393*** | | 0.433*** | | 0.022 | | 0.203*** |
| | | (0.12) | | (0.11) | | (0.03) | | (0.05) |
| Far from Shillong | | 0.040 | | 0.057 | | 0.059 | | 0.035 |
| | | (0.09) | | (0.07) | | (0.04) | | (0.05) |
| Female | 0.022 | 0.090*** | 0.002 | 0.068* | 0.984** | 0.185*** | 0.151* | 0.131*** |
| | (0.05) | (0.03) | (0.05) | (0.03) | (0.48) | (0.04) | (0.08) | (0.03) |
| Age | 0.038* | 0.030** | 0.040*** | 0.037*** | 0.159* | 0.027** | -0.016 | -0.020 |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.08) | (0.01) | (0.02) | (0.01) |
| Squared age | -0.001** | -0.000** | -0.001*** | -0.000*** | -0.001* | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.272*** | -0.349*** | -0.237*** | -0.328*** | -0.934 | -0.168** | -0.128 | -0.080** |
| | (0.06) | (0.05) | (0.05) | (0.04) | (0.57) | (0.06) | (0.09) | (0.03) |
| Number of children | -0.041*** | -0.023 | -0.042*** | -0.026 | -0.075*** | -0.009*** | -0.039* | -0.010 |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.03) | (0.00) | (0.02) | (0.01) |
| Education | 0.009 | 0.005 | 0.003 | -0.004 | -0.032 | -0.009 | 0.001 | -0.003 |
| | (0.02) | (0.02) | (0.01) | (0.01) | (0.04) | (0.01) | (0.01) | (0.00) |
| Own land | 0.050 | -0.064 | 0.050 | -0.068 | -0.081 | -0.028 | 0.530*** | 0.289*** |
| | (0.11) | (0.08) | (0.08) | (0.05) | (0.22) | (0.03) | (0.15) | (0.06) |
| Income | 0.000 | 0.000 | 0.000 | -0.000 | -0.000 | -0.000* | -0.000 | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.078 | 0.009 | 0.022 | -0.070 | -0.173 | -0.043*** | -0.040 | -0.073** |
| | (0.08) | (0.04) | (0.08) | (0.05) | (0.18) | (0.02) | (0.09) | (0.03) |
| Knows interest rate | -0.104 | -0.109 | -0.047 | -0.032 | -0.184 | -0.024 | 0.042 | 0.046 |
| | (0.13) | (0.07) | (0.10) | (0.04) | (0.46) | (0.06) | (0.09) | (0.07) |
| Knows bank deposit | 0.129* | 0.110** | 0.143* | 0.140** | 0.418* | 0.076*** | 0.096 | 0.034 |
| | (0.07) | (0.05) | (0.08) | (0.06) | (0.22) | (0.02) | (0.08) | (0.03) |
| Bank account | -0.019 | -0.023 | -0.010 | -0.016 | 0.323 | 0.052*** | 0.087 | 0.056*** |
| | (0.05) | (0.03) | (0.06) | (0.05) | (0.24) | (0.02) | (0.06) | (0.02) |
| Risk aversion | 0.159*** | 0.094 | 0.140* | 0.073 | 0.209 | 0.021 | 0.223*** | 0.088** |
| | (0.05) | (0.06) | (0.07) | (0.06) | (0.14) | (0.03) | (0.05) | (0.03) |
| Memory game | -0.009** | 0.002 | -0.012*** | -0.003 | 0.001 | 0.001 | -0.006 | 0.002 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.049 | 0.046 | 0.012 | -0.005 | 0.215*** | 0.032 | -0.051 | -0.044** |
| | (0.04) | (0.05) | (0.05) | (0.04) | (0.08) | (0.03) | (0.05) | (0.02) |
| Competitive | 0.049 | -0.022 | 0.075 | 0.015 | 0.160 | 0.022 | -0.007 | -0.047 |
| | (0.05) | (0.04) | (0.06) | (0.05) | (0.11) | (0.02) | (0.07) | (0.04) |
| Total population | 0.000 | 0.000*** | -0.000 | 0.000*** | -0.000 | -0.000 | 0.000 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 15.24 | | 17.06 | | 1.43 | | 7.50 | |
| F-statistic | | 13.86 | | 23.68 | | 1.49 | | 11.85 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The two instrumental variables used are a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not and an instrumental variable that measures if the households live far from Shillong (>32km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A6:** Female empowerment and food expenditure: IV - Full table

| | Food Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 2834.467*** | | | | | | | |
| | (1052.20) | | | | | | | |
| Long financial decisions female | | | 2529.733*** | | | | | |
| | | | (910.00) | | | | | |
| Female head | | | | | 20343.501 | | | |
| | | | | | (16000.15) | | | |
| Female land title | | | | | | | 5273.998** | |
| | | | | | | | (2539.93) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Female | -384.446** | 0.090*** | -301.788* | 0.068** | -3895.830 | 0.185*** | -820.275** | 0.131*** |
| | (192.77) | (0.03) | (177.38) | (0.03) | (2630.05) | (0.04) | (409.26) | (0.03) |
| Age | -69.303 | 0.030** | -76.642 | 0.036*** | -509.162 | 0.026** | 123.182 | -0.021 |
| | (50.77) | (0.01) | (56.98) | (0.01) | (369.05) | (0.01) | (100.50) | (0.01) |
| Squared age | 1.019 | -0.000** | 1.046 | -0.000*** | 4.434 | -0.000 | -1.392 | 0.000 |
| | (0.68) | (0.00) | (0.74) | (0.00) | (3.65) | (0.00) | (1.41) | (0.00) |
| Married | 878.536** | -0.348*** | 719.593* | -0.327*** | 3271.537 | -0.166** | 309.472 | -0.079** |
| | (396.54) | (0.05) | (387.30) | (0.04) | (2387.67) | (0.06) | (437.40) | (0.03) |
| Number of children | 127.895** | -0.023 | 128.914* | -0.026 | 250.131 | -0.009*** | 115.392 | -0.010 |
| | (58.50) | (0.02) | (74.48) | (0.02) | (179.24) | (0.00) | (117.12) | (0.01) |
| Education | -45.856 | 0.006 | -22.802 | -0.002 | 103.909 | -0.006 | -17.144 | -0.002 |
| | (94.88) | (0.02) | (70.83) | (0.01) | (185.49) | (0.01) | (88.36) | (0.01) |
| Own land | 480.685** | -0.067 | 473.804** | -0.072 | 953.989 | -0.033 | -1217.825 | 0.286*** |
| | (198.39) | (0.08) | (222.41) | (0.05) | (1162.44) | (0.03) | (811.87) | (0.07) |
| Income | 0.166*** | 0.000 | 0.174*** | -0.000 | 0.213*** | -0.000 | 0.177*** | -0.000 |
| | (0.04) | (0.00) | (0.04) | (0.00) | (0.05) | (0.00) | (0.04) | (0.00) |
| Computations | -160.807 | 0.009 | 40.960 | -0.070 | 755.585 | -0.044*** | 247.443 | -0.073** |
| | (162.48) | (0.04) | (217.19) | (0.05) | (861.08) | (0.02) | (270.08) | (0.03) |
| Knows interest rate | 397.068* | -0.112* | 171.111 | -0.037 | 673.900 | -0.029 | -150.374 | 0.043 |
| | (231.31) | (0.06) | (189.07) | (0.03) | (1511.56) | (0.06) | (498.72) | (0.07) |
| Knows bank deposit | 360.233 | 0.103** | 324.395 | 0.129** | -685.432 | 0.066*** | 506.729** | 0.028 |
| | (231.09) | (0.05) | (235.96) | (0.06) | (1027.95) | (0.01) | (225.87) | (0.03) |
| Bank account | 223.678 | -0.018 | 193.730 | -0.009 | -1024.718 | 0.059*** | -148.220 | 0.061*** |
| | (136.95) | (0.03) | (153.42) | (0.05) | (1093.23) | (0.02) | (257.11) | (0.02) |
| Risk aversion | 175.219 | 0.094 | 257.290 | 0.073 | 4.455 | 0.022 | -22.360 | 0.088** |
| | (238.23) | (0.07) | (311.65) | (0.06) | (568.81) | (0.03) | (299.29) | (0.03) |
| Memory game | -12.613 | 0.002 | -1.189 | -0.002 | -51.135 | 0.002 | -21.826 | 0.003 |
| | (16.45) | (0.01) | (14.29) | (0.01) | (57.00) | (0.00) | (15.76) | (0.00) |
| Short preferences | -662.195*** | 0.049 | -523.996** | 0.000 | -1266.722* | 0.037 | -308.768 | -0.041* |
| | (240.34) | (0.05) | (216.93) | (0.04) | (650.48) | (0.03) | (268.25) | (0.02) |
| Competitive | -47.555 | -0.025 | -145.050 | 0.010 | -457.439 | 0.017 | 143.196 | -0.050 |
| | (157.96) | (0.04) | (197.24) | (0.05) | (449.17) | (0.02) | (300.76) | (0.04) |
| Total population | 0.003* | 0.000*** | 0.005*** | 0.000*** | 0.016 | -0.000 | 0.003 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 22.32 | | 18.45 | | 2.13 | | 11.66 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditures with food and groceries. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A7:** Female empowerment and education expenditure: IV - Full table

| | Education Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 3384.980 | | | | | | | |
| | (2591.00) | | | | | | | |
| Long financial decisions female | | | 2977.889 | | | | | |
| | | | (2270.46) | | | | | |
| Female head | | | | | 48595.886 | | | |
| | | | | | (81646.54) | | | |
| Female land title | | | | | | | 5809.211 | |
| | | | | | | | (4135.27) | |
| Far from Cherrapunji | | 0.381*** | | 0.433*** | | 0.027 | | 0.222*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.06) |
| Female | 5.883 | 0.070** | 108.916 | 0.045* | -8173.677 | 0.173*** | -586.423 | 0.143*** |
| | (391.51) | (0.03) | (342.45) | (0.03) | (13082.73) | (0.04) | (748.03) | (0.03) |
| Age | -338.429** | 0.030* | -334.187** | 0.033*** | -1445.310 | 0.025*** | -69.795 | -0.029*** |
| | (163.22) | (0.02) | (144.91) | (0.01) | (1925.20) | (0.01) | (105.99) | (0.01) |
| Squared age | 4.977** | -0.000** | 4.816** | -0.000** | 13.036 | -0.000** | 1.558 | 0.000** |
| | (2.21) | (0.00) | (1.94) | (0.00) | (14.74) | (0.00) | (1.35) | (0.00) |
| Married | 1307.754 | -0.360*** | 1049.394 | -0.323*** | 9396.479 | -0.192*** | 324.789 | -0.041 |
| | (1056.71) | (0.05) | (886.57) | (0.07) | (15196.23) | (0.05) | (322.02) | (0.04) |
| Number of children | 407.530* | -0.023 | 403.269** | -0.025 | 643.276 | -0.006 | 406.357*** | -0.013 |
| | (208.10) | (0.02) | (197.85) | (0.02) | (699.82) | (0.00) | (132.97) | (0.01) |
| Education | 364.247*** | -0.006 | 381.621*** | -0.013 | 1053.557 | -0.015 | 423.950*** | -0.014** |
| | (115.81) | (0.02) | (135.32) | (0.01) | (885.29) | (0.01) | (148.92) | (0.01) |
| Own land | -1165.823 | -0.065 | -1258.676* | -0.043 | 671.031 | -0.042 | -2900.829** | 0.261*** |
| | (775.75) | (0.08) | (717.77) | (0.06) | (4245.72) | (0.03) | (1441.11) | (0.07) |
| Income | 0.374*** | -0.000 | 0.384*** | -0.000 | 0.470** | -0.000 | 0.376*** | -0.000 |
| | (0.12) | (0.00) | (0.12) | (0.00) | (0.21) | (0.00) | (0.12) | (0.00) |
| Computations | -10.740 | -0.012 | 119.534 | -0.057 | 3239.217 | -0.068*** | 354.211 | -0.070** |
| | (318.29) | (0.07) | (340.73) | (0.06) | (5847.85) | (0.02) | (516.49) | (0.03) |
| Knows interest rate | 963.673* | -0.088 | 769.210 | -0.034 | 1627.174 | -0.020 | 358.161 | 0.053 |
| | (566.22) | (0.07) | (498.12) | (0.05) | (4648.79) | (0.07) | (364.81) | (0.08) |
| Knows bank deposit | -1189.015 | 0.178** | -1244.103 | 0.221** | -4170.020 | 0.074*** | -947.789* | 0.062* |
| | (810.25) | (0.07) | (849.07) | (0.08) | (6100.20) | (0.02) | (546.10) | (0.03) |
| Bank account | -17.065 | -0.052 | -108.757 | -0.029 | -3895.389 | 0.076*** | -252.178 | 0.010 |
| | (338.26) | (0.04) | (334.08) | (0.06) | (6591.16) | (0.02) | (323.99) | (0.03) |
| Risk aversion | -1087.025*** | 0.035 | -1072.085*** | 0.035 | -2482.733 | 0.031 | -1263.543** | 0.051 |
| | (363.19) | (0.06) | (300.61) | (0.08) | (2198.60) | (0.02) | (502.12) | (0.06) |
| Memory game | 47.322 | 0.002 | 58.108 | -0.002 | -27.847 | 0.002 | 46.876 | 0.001 |
| | (33.04) | (0.00) | (36.72) | (0.00) | (167.09) | (0.00) | (28.97) | (0.00) |
| Short preferences | -26.351 | 0.064 | 99.306 | 0.030 | -740.859 | 0.019 | 385.800 | -0.034* |
| | (431.71) | (0.05) | (412.87) | (0.04) | (1836.71) | (0.04) | (489.00) | (0.02) |
| Competitive | 422.526 | -0.019 | 284.554 | 0.025 | -348.817 | 0.015 | 752.113 | -0.068 |
| | (380.01) | (0.05) | (313.28) | (0.06) | (1397.55) | (0.02) | (591.35) | (0.04) |
| Total population | -0.014*** | 0.000** | -0.012*** | 0.000** | 0.014 | -0.000 | -0.013*** | 0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.05) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 477 | 477 | 477 | 477 | 477 | 477 | 477 | 477 |
| Kleibergen-Paap F-statistic | 21.04 | | 16.96 | | 0.44 | | 5.15 | |
| F-statistic | | 16.90 | | 24.28 | | 0.46 | | 15.56 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditures with education. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A8:** Female empowerment and temptation goods expenditure: IV - Full table

| | Temptation Goods | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 36.797 | | | | | | | |
| | (332.25) | | | | | | | |
| Long financial decisions female | | | 32.581 | | | | | |
| | | | (294.24) | | | | | |
| Female head | | | | | 381.231 | | | |
| | | | | | (3261.72) | | | |
| Female land title | | | | | | | 75.538 | |
| | | | | | | | (674.79) | |
| Far from Cherrapunji | | 0.414*** | | 0.467*** | | 0.040 | | 0.202*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Female | 94.119 | 0.097*** | 95.274* | 0.074*** | 33.196 | 0.169*** | 88.504 | 0.122*** |
| | (64.59) | (0.03) | (57.40) | (0.03) | (568.57) | (0.04) | (106.36) | (0.03) |
| Age | 25.361 | 0.031** | 25.301 | 0.036*** | 17.485 | 0.024** | 27.904 | -0.019 |
| | (20.31) | (0.01) | (20.61) | (0.01) | (70.66) | (0.01) | (30.05) | (0.01) |
| Squared age | -0.385 | -0.000*** | -0.385 | -0.000*** | -0.319 | -0.000 | -0.417 | 0.000 |
| | (0.27) | (0.00) | (0.28) | (0.00) | (0.63) | (0.00) | (0.39) | (0.00) |
| Married | -36.596 | -0.343*** | -39.252 | -0.306*** | -0.746 | -0.127** | -44.186 | -0.067* |
| | (85.97) | (0.04) | (70.19) | (0.04) | (367.25) | (0.06) | (58.11) | (0.04) |
| Number of children | 7.178 | -0.023 | 7.195 | -0.027 | 8.039 | -0.005* | 6.528 | -0.003 |
| | (10.75) | (0.02) | (10.92) | (0.02) | (16.17) | (0.00) | (9.44) | (0.01) |
| Education | -28.288 | 0.003 | -27.910 | -0.008 | -24.477 | -0.010 | -28.316 | 0.002 |
| | (24.96) | (0.02) | (23.31) | (0.01) | (25.59) | (0.01) | (25.46) | (0.01) |
| Own land | -14.190 | -0.067 | -14.405 | -0.069 | -3.342 | -0.035 | -39.598 | 0.304*** |
| | (84.97) | (0.08) | (84.59) | (0.05) | (144.29) | (0.04) | (208.65) | (0.06) |
| Income | 0.042*** | 0.000 | 0.042*** | -0.000 | 0.042*** | -0.000 | 0.042*** | -0.000 |
| | (0.01) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) |
| Computations | 6.926 | 0.016 | 9.231 | -0.053 | 27.809 | -0.053*** | 11.802 | -0.057* |
| | (56.16) | (0.05) | (64.44) | (0.05) | (198.16) | (0.01) | (77.00) | (0.03) |
| Knows interest rate | 19.299 | -0.115 | 15.936 | -0.026 | 18.368 | -0.009 | 11.948 | 0.041 |
| | (109.94) | (0.07) | (86.98) | (0.04) | (95.61) | (0.07) | (66.62) | (0.07) |
| Knows bank deposit | -56.345 | 0.127** | -56.773 | 0.156** | -75.532 | 0.063*** | -55.858 | 0.055 |
| | (126.74) | (0.05) | (130.17) | (0.07) | (277.33) | (0.02) | (123.83) | (0.03) |
| Bank account | 138.114** | -0.049 | 137.505** | -0.037 | 113.913 | 0.059*** | 133.183*** | 0.041* |
| | (69.87) | (0.03) | (65.43) | (0.05) | (165.20) | (0.02) | (48.17) | (0.02) |
| Risk aversion | 83.412 | 0.110 | 84.988 | 0.076 | 85.782 | 0.004 | 80.147 | 0.097*** |
| | (76.75) | (0.07) | (72.10) | (0.06) | (74.18) | (0.03) | (92.55) | (0.03) |
| Memory game | -3.084 | 0.003 | -2.927 | -0.002 | -3.661 | 0.002 | -3.204 | 0.003 |
| | (3.22) | (0.00) | (3.32) | (0.01) | (6.47) | (0.00) | (3.67) | (0.00) |
| Short preferences | -24.982 | 0.041 | -23.425 | -0.001 | -30.017 | 0.017 | -18.543 | -0.065*** |
| | (45.76) | (0.05) | (42.23) | (0.05) | (74.16) | (0.03) | (57.23) | (0.02) |
| Competitive | -13.279 | -0.031 | -14.916 | 0.015 | -21.524 | 0.019 | -8.601 | -0.077* |
| | (60.04) | (0.04) | (51.75) | (0.05) | (56.76) | (0.02) | (91.58) | (0.04) |
| Total population | 0.001 | 0.000** | 0.001 | 0.000** | 0.001 | -0.000 | 0.001 | 0.000** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 551 | 551 | 551 | 551 | 551 | 551 | 551 | 551 |
| Kleibergen-Paap F-statistic | 25.47 | | 28.94 | | 0.79 | | 11.37 | |
| F-statistic | | 16.07 | | 25.19 | | 0.85 | | 23.02 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is the value of monthly expenditure with temptation goods. In each column, one measure of female empowerment is used. In column (1), a dummy for whether a female is responsible for short-term financial decisions, in column (2), a dummy for whether a female is responsible for long-term financial decisions, in column (3), a dummy for whether a female is the household head and in column (4), a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A9:** Female empowerment and financial decisions: IV controlling number of public schools

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Savings** | | | | | | | | |
| | Savings | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.967*** | | | | | | | |
| | (0.26) | | | | | | | |
| Long financial decisions female | | | -0.815*** | | | | | |
| | | | (0.21) | | | | | |
| Female head | | | | | -3.379** | | | |
| | | | | | (1.54) | | | |
| Female land title | | | | | | | -1.785*** | |
| | | | | | | | (0.51) | |
| Far from Cherrapunji | | 0.312*** | | 0.371*** | | 0.089** | | 0.169*** |
| | | (0.08) | | (0.08) | | (0.03) | | (0.05) |
| Government primary schools | 0.007 | 0.015*** | 0.004 | 0.014*** | -0.011* | -0.001 | 0.000 | 0.005 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 21.09 | | 25.53 | | 7.05 | | 10.19 | |
| F-statistic | | 15.17 | | 20.96 | | 7.68 | | 11.76 |
| **Panel B: Food** | | | | | | | | |
| | Food Expenditure | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 2370.028* | | | | | | | |
| | (1221.00) | | | | | | | |
| Long financial decisions female | | | 1997.826** | | | | | |
| | | | (1000.18) | | | | | |
| Female head | | | | | 8281.017* | | | |
| | | | | | (4770.46) | | | |
| Female land title | | | | | | | 4373.797 | |
| | | | | | | | (2838.53) | |
| Far from Cherrapunji | | 0.312*** | | 0.371*** | | 0.089** | | 0.169*** |
| | | (0.08) | | (0.08) | | (0.03) | | (0.05) |
| Government primary schools | 26.251* | 0.015*** | 33.668* | 0.014*** | 70.114* | -0.001 | 41.906 | 0.005 |
| | (14.81) | (0.00) | (18.11) | (0.00) | (36.20) | (0.00) | (33.88) | (0.00) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 21.09 | | 25.53 | | 7.05 | | 10.19 | |
| F-statistic | | 15.17 | | 20.96 | | 7.68 | | 11.76 |
| **Panel C: Education** | | | | | | | | |
| | Education Expenditure | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 4916.821* | | | | | | | |
| | (2858.29) | | | | | | | |
| Long financial decisions female | | | 3950.062* | | | | | |
| | | | (2333.62) | | | | | |
| Female head | | | | | 21627.018 | | | |
| | | | | | (17353.75) | | | |
| Female land title | | | | | | | 9082.843* | |
| | | | | | | | (5265.54) | |
| Far from Cherrapunji | | 0.285*** | | 0.355*** | | 0.065** | | 0.154*** |
| | | (0.07) | | (0.07) | | (0.03) | | (0.05) |
| Government primary schools | -137.143*** | 0.015*** | -120.454*** | 0.015*** | -15.307 | -0.002 | -101.561** | 0.004 |
| | (49.09) | (0.01) | (41.25) | (0.00) | (87.26) | (0.00) | (44.99) | (0.00) |
| Number of Observations | 401 | 401 | 401 | 401 | 401 | 401 | 401 | 401 |
| Kleibergen-Paap F-statistic | 20.26 | | 23.43 | | 4.15 | | 7.25 | |
| F-statistic | | 16.30 | | 26.11 | | 4.68 | | 8.61 |
| **Panel D: Temptation goods** | | | | | | | | |
| | Temptation Goods | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 64.686 | | | | | | | |
| | (308.94) | | | | | | | |
| Long financial decisions female | | | 53.660 | | | | | |
| | | | (255.94) | | | | | |
| Female head | | | | | 254.340 | | | |
| | | | | | (1204.87) | | | |
| Female land title | | | | | | | 131.458 | |
| | | | | | | | (600.92) | |
| Far from Cherrapunji | | 0.317*** | | 0.383*** | | 0.081** | | 0.156*** |
| | | (0.08) | | (0.08) | | (0.04) | | (0.05) |
| Government primary schools | 2.731 | 0.015*** | 2.976 | 0.014*** | 4.069 | -0.001 | 3.147 | 0.004 |
| | (7.33) | (0.00) | (7.17) | (0.00) | (8.36) | (0.00) | (7.39) | (0.00) |
| Number of Observations | 449 | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| Kleibergen-Paap F-statistic | 22.42 | | 28.26 | | 4.51 | | 8.92 | |
| F-statistic | | 15.23 | | 21.98 | | 4.43 | | 11.57 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A10:** Female empowerment and financial decisions: IV controlling number of private schools

**Panel A: Savings**

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.856*** | | | | | | | |
| | (0.21) | | | | | | | |
| Long financial decisions female | | | -0.784*** | | | | | |
| | | | (0.18) | | | | | |
| Female head | | | | | -4.168* | | | |
| | | | | | (2.26) | | | |
| Female land title | | | | | | | -1.503*** | |
| | | | | | | | (0.40) | |
| Far from Cherrapunji | | 0.424*** | | 0.463*** | | 0.087** | | 0.242*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.05) |
| Private primary schools | 0.004 | 0.012** | 0.002 | 0.011*** | -0.009 | -0.000 | 0.003 | 0.006*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 23.66 | | 24.28 | | 4.17 | | 15.71 | |
| F-statistic | | 20.07 | | 24.79 | | 4.75 | | 25.88 |

**Panel B: Food**

| | Food Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 2571.967** | | | | | | | |
| | (1123.51) | | | | | | | |
| Long financial decisions female | | | 2357.336** | | | | | |
| | | | (1056.94) | | | | | |
| Female head | | | | | 12526.089 | | | |
| | | | | | (7957.71) | | | |
| Female land title | | | | | | | 4516.429* | |
| | | | | | | | (2638.11) | |
| Far from Cherrapunji | | 0.424*** | | 0.463*** | | 0.087** | | 0.242*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.05) |
| Private primary schools | 12.296* | 0.012** | 18.523** | 0.011*** | 50.175** | -0.000 | 16.499 | 0.006*** |
| | (6.79) | (0.00) | (7.29) | (0.00) | (25.20) | (0.00) | (15.59) | (0.00) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 23.66 | | 24.28 | | 4.17 | | 15.71 | |
| F-statistic | | 20.07 | | 24.79 | | 4.75 | | 25.88 |

**Panel C: Education**

| | Education Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 3644.917 | | | | | | | |
| | (2852.88) | | | | | | | |
| Long financial decisions female | | | 3232.088 | | | | | |
| | | | (2482.42) | | | | | |
| Female head | | | | | 28551.318 | | | |
| | | | | | (32461.37) | | | |
| Female land title | | | | | | | 6310.368 | |
| | | | | | | | (4487.79) | |
| Far from Cherrapunji | | 0.393*** | | 0.443*** | | 0.050 | | 0.227*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.06) |
| Private primary schools | -63.991*** | 0.012** | -54.430*** | 0.011** | 28.233 | -0.002 | -58.266** | 0.006** |
| | (23.11) | (0.01) | (20.28) | (0.00) | (103.42) | (0.00) | (23.04) | (0.00) |
| Number of Observations | 401 | 401 | 401 | 401 | 401 | 401 | 401 | 401 |
| Kleibergen-Paap F-statistic | 21.06 | | 20.74 | | 1.52 | | 11.33 | |
| F-statistic | | 18.39 | | 23.73 | | 1.58 | | 15.12 |

**Panel D: Temptation goods**

| | Temptation Goods | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 190.805 | | | | | | | |
| | (357.31) | | | | | | | |
| Long financial decisions female | | | 174.837 | | | | | |
| | | | (329.06) | | | | | |
| Female head | | | | | 1164.678 | | | |
| | | | | | (2000.66) | | | |
| Female land title | | | | | | | 371.900 | |
| | | | | | | | (651.31) | |
| Far from Cherrapunji | | 0.430*** | | 0.470*** | | 0.070 | | 0.221*** |
| | | (0.10) | | (0.10) | | (0.05) | | (0.05) |
| Private primary schools | 2.816 | 0.012** | 3.389 | 0.010** | 6.502 | -0.001 | 3.108 | 0.006** |
| | (4.44) | (0.00) | (5.03) | (0.00) | (9.37) | (0.00) | (5.24) | (0.00) |
| Number of Observations | 449 | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| Kleibergen-Paap F-statistic | 24.05 | | 25.19 | | 2.21 | | 12.50 | |
| F-statistic | | 18.49 | | 23.85 | | 2.27 | | 23.39 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A11:** Female empowerment and financial decisions: IV controlling the number of hospitals

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Savings** | | | | | | | | |
| | Savings | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -1.095*** | | | | | | | |
| | (0.36) | | | | | | | |
| Long financial decisions female | | | -0.870*** | | | | | |
| | | | (0.26) | | | | | |
| Female head | | | | | -2.894** | | | |
| | | | | | (1.24) | | | |
| Female land title | | | | | | | -1.831*** | |
| | | | | | | | (0.59) | |
| Far from Cherrapunji | | 0.244*** | | 0.307*** | | 0.092*** | | 0.146*** |
| | | (0.08) | | (0.08) | | (0.03) | | (0.05) |
| Number of Allopathic Hospitals | 0.110 | 0.219*** | 0.056 | 0.214*** | -0.200*** | -0.024 | -0.047 | 0.045 |
| | (0.11) | (0.07) | (0.08) | (0.07) | (0.07) | (0.03) | (0.11) | (0.07) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 13.69 | | 19.47 | | 9.24 | | 7.86 | |
| F-statistic | | 8.67 | | 14.73 | | 10.63 | | 9.65 |
| **Panel B: Food** | | | | | | | | |
| | Food Expenditure | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 1954.669* | | | | | | | |
| | (1101.55) | | | | | | | |
| Long financial decisions female | | | 1554.421* | | | | | |
| | | | (835.17) | | | | | |
| Female head | | | | | 5167.310 | | | |
| | | | | | (3210.69) | | | |
| Female land title | | | | | | | 3269.413 | |
| | | | | | | | (2383.27) | |
| Far from Cherrapunji | | 0.244*** | | 0.307*** | | 0.092*** | | 0.146*** |
| | | (0.08) | | (0.08) | | (0.03) | | (0.05) |
| Number of Allopathic Hospitals | 617.859* | 0.219*** | 712.669* | 0.214*** | 1171.504** | -0.024 | 897.665 | 0.045 |
| | (364.52) | (0.07) | (409.69) | (0.07) | (523.45) | (0.03) | (610.80) | (0.07) |
| Number of Observations | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 520 |
| Kleibergen-Paap F-statistic | 13.69 | | 19.47 | | 9.24 | | 7.86 | |
| F-statistic | | 8.67 | | 14.73 | | 10.63 | | 9.65 |
| **Panel C: Education** | | | | | | | | |
| | Education Expenditure | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 7665.669** | | | | | | | |
| | (3358.30) | | | | | | | |
| Long financial decisions female | | | 5740.390** | | | | | |
| | | | (2445.34) | | | | | |
| Female head | | | | | 22521.329* | | | |
| | | | | | (13565.71) | | | |
| Female land title | | | | | | | 12490.553** | |
| | | | | | | | (6304.69) | |
| Far from Cherrapunji | | 0.216*** | | 0.289*** | | 0.074*** | | 0.133** |
| | | (0.08) | | (0.07) | | (0.03) | | (0.05) |
| Number of Allopathic Hospitals | -2873.987** | 0.222*** | -2461.592*** | 0.225*** | -222.232 | -0.042 | -1633.901* | 0.037 |
| | (1247.70) | (0.08) | (924.98) | (0.07) | (1269.60) | (0.03) | (856.20) | (0.07) |
| Number of Observations | 401 | 401 | 401 | 401 | 401 | 401 | 401 | 401 |
| Kleibergen-Paap F-statistic | 12.09 | | 17.01 | | 6.83 | | 5.39 | |
| F-statistic | | 8.14 | | 17.32 | | 8.47 | | 6.52 |
| **Panel D: Temptation goods** | | | | | | | | |
| | Temptation Goods | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 17.017 | | | | | | | |
| | (365.62) | | | | | | | |
| Long financial decisions female | | | 13.203 | | | | | |
| | | | (283.69) | | | | | |
| Female head | | | | | 49.419 | | | |
| | | | | | (1065.56) | | | |
| Female land title | | | | | | | 31.391 | |
| | | | | | | | (668.98) | |
| Far from Cherrapunji | | 0.250*** | | 0.323*** | | 0.086** | | 0.136*** |
| | | (0.08) | | (0.08) | | (0.04) | | (0.04) |
| Number of Allopathic Hospitals | 50.238 | 0.210** | 51.189 | 0.199*** | 55.293 | -0.030 | 52.571 | 0.040 |
| | (145.26) | (0.08) | (134.53) | (0.07) | (119.51) | (0.03) | (123.83) | (0.08) |
| Number of Observations | 449 | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| Kleibergen-Paap F-statistic | 15.35 | | 22.90 | | 5.98 | | 7.17 | |
| F-statistic | | 9.61 | | 16.78 | | 5.65 | | 9.70 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A12:** Female empowerment and financial decisions: IV controlling for road accessibility

**Panel A: Savings**

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -1.233** | | | | | | | |
| | (0.57) | | | | | | | |
| Long financial decisions female | | | -0.945* | | | | | |
| | | | (0.50) | | | | | |
| Female head | | | | | -13.260 | | | |
| | | | | | (27.16) | | | |
| Female land title | | | | | | | 11.764 | |
| | | | | | | | (47.91) | |
| Far from Cherrapunji | | 0.182** | | 0.237*** | | 0.017 | | -0.019 |
| | | (0.07) | | (0.06) | | (0.04) | | (0.08) |
| Road access | -0.051 | -0.076 | -0.039 | -0.087 | -1.193 | -0.093* | 2.272 | -0.189** |
| | (0.17) | (0.08) | (0.17) | (0.07) | (3.03) | (0.05) | (8.26) | (0.08) |
| Number of Observations | 506 | 506 | 506 | 506 | 506 | 506 | 506 | 506 |
| Kleibergen-Paap F-statistic | 5.96 | | 6.70 | | 0.17 | | 0.04 | |
| F-statistic | | 6.06 | | 15.20 | | 0.21 | | 0.06 |

**Panel B: Food**

| | Food Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 8709.903** | | | | | | | |
| | (4180.99) | | | | | | | |
| Long financial decisions female | | | 6673.513*** | | | | | |
| | | | (2438.03) | | | | | |
| Female head | | | | | 93672.221 | | | |
| | | | | | (204829.91) | | | |
| Female land title | | | | | | | -8.31e+04 | |
| | | | | | | | (321822.83) | |
| Far from Cherrapunji | | 0.182** | | 0.237*** | | 0.017 | | -0.019 |
| | | (0.07) | | (0.06) | | (0.04) | | (0.08) |
| Road access | 2157.002** | -0.076 | 2074.090*** | -0.087 | 10223.043 | -0.093* | -1.43e+04 | -0.189** |
| | (1013.16) | (0.08) | (798.48) | (0.07) | (22948.11) | (0.05) | (55510.89) | (0.08) |
| Number of Observations | 506 | 506 | 506 | 506 | 506 | 506 | 506 | 506 |
| Kleibergen-Paap F-statistic | 5.96 | | 6.70 | | 0.17 | | 0.04 | |
| F-statistic | | 6.06 | | 15.20 | | 0.21 | | 0.06 |

**Panel C: Education**

| | Education Expenditure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 687.266 | | | | | | | |
| | (4455.70) | | | | | | | |
| Long financial decisions female | | | 535.657 | | | | | |
| | | | (3508.00) | | | | | |
| Female head | | | | | 9208.372 | | | |
| | | | | | (63584.35) | | | |
| Female land title | | | | | | | -7926.794 | |
| | | | | | | | (59321.05) | |
| Far from Cherrapunji | | 0.216** | | 0.277*** | | 0.016 | | -0.019 |
| | | (0.08) | | (0.06) | | (0.04) | | (0.08) |
| Road access | -2085.838 | -0.004 | -2077.799 | -0.020 | -1422.342 | -0.072 | -3493.056 | -0.177** |
| | (1461.86) | (0.09) | (1508.62) | (0.08) | (5805.09) | (0.05) | (9315.80) | (0.09) |
| Number of Observations | 388 | 388 | 388 | 388 | 388 | 388 | 388 | 388 |
| Kleibergen-Paap F-statistic | 7.22 | | 9.65 | | 0.13 | | 0.04 | |
| F-statistic | | 6.83 | | 23.36 | | 0.18 | | 0.06 |

**Panel D: Temptation goods**

| | Temptation Goods | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 130.130 | | | | | | | |
| | (1001.49) | | | | | | | |
| Long financial decisions female | | | 96.230 | | | | | |
| | | | (747.27) | | | | | |
| Female head | | | | | 870.484 | | | |
| | | | | | (7153.87) | | | |
| Female land title | | | | | | | -9065.461 | |
| | | | | | | | (207601.17) | |
| Far from Cherrapunji | | 0.193** | | 0.260*** | | 0.029 | | -0.003 |
| | | (0.09) | | (0.05) | | (0.04) | | (0.07) |
| Road access | 80.355 | -0.088 | 78.169 | -0.096 | 129.835 | -0.070 | -1407.881 | -0.163** |
| | (273.37) | (0.09) | (257.86) | (0.06) | (670.30) | (0.05) | (33326.81) | (0.07) |
| Number of Observations | 436 | 436 | 436 | 436 | 436 | 436 | 436 | 436 |
| Kleibergen-Paap F-statistic | 6.96 | | 8.13 | | 0.47 | | 0.00 | |
| F-statistic | | 4.85 | | 22.81 | | 0.64 | | 0.00 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

## Table A13: Female empowerment and expenditures per household member

**Panel A: Food**

| | Food Expenditure per household member | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 593.742*** | | | | | | | |
| | (185.00) | | | | | | | |
| Long financial decisions female | | | 529.909*** | | | | | |
| | | | (166.12) | | | | | |
| Female head | | | | | 4261.399 | | | |
| | | | | | (2977.98) | | | |
| Female land title | | | | | | | 1104.756** | |
| | | | | | | | (465.14) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 27.57 | | 30.93 | | 1.89 | | 15.02 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

**Panel B: Education**

| | Education Expenditure Per Capita | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -45.516 | | | | | | | |
| | (319.39) | | | | | | | |
| Long financial decisions female | | | -40.042 | | | | | |
| | | | (280.56) | | | | | |
| Female head | | | | | -653.442 | | | |
| | | | | | (4461.36) | | | |
| Female land title | | | | | | | -78.113 | |
| | | | | | | | (551.54) | |
| Far from Cherrapunji | | 0.381*** | | 0.433*** | | 0.027 | | 0.222*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.06) |
| Number of Observations | 477 | 477 | 477 | 477 | 477 | 477 | 477 | 477 |
| Kleibergen-Paap F-statistic | 22.44 | | 23.42 | | 0.42 | | 11.72 | |
| F-statistic | | 16.90 | | 24.28 | | 0.46 | | 15.56 |

**Panel C: Temptation goods**

| | Temptation Goods Per Capita | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -28.991 | | | | | | | |
| | (81.10) | | | | | | | |
| Long financial decisions female | | | -25.669 | | | | | |
| | | | (71.32) | | | | | |
| Female head | | | | | -300.361 | | | |
| | | | | | (1018.34) | | | |
| Female land title | | | | | | | -59.515 | |
| | | | | | | | (170.40) | |
| Far from Cherrapunji | | 0.414*** | | 0.467*** | | 0.040 | | 0.202*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Number of Observations | 551 | 551 | 551 | 551 | 551 | 551 | 551 | 551 |
| Kleibergen-Paap F-statistic | 25.47 | | 28.94 | | 0.79 | | 11.37 | |
| F-statistic | | 16.07 | | 25.19 | | 0.85 | | 23.02 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is defined as expenditures per household member. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

## Table A14: Female empowerment and expenditure per child

**Panel A: Food**

| | Food Expenditure Per Child | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 1659.832*** | | | | | | | |
| | (638.31) | | | | | | | |
| Long financial decisions female | | | 1636.718** | | | | | |
| | | | (656.69) | | | | | |
| Female head | | | | | 14888.494 | | | |
| | | | | | (13543.95) | | | |
| Female land title | | | | | | | 3060.255* | |
| | | | | | | | (1721.62) | |
| Far from Cherrapunji | | 0.460*** | | 0.467*** | | 0.051 | | 0.250*** |
| | | (0.10) | | (0.10) | | (0.04) | | (0.06) |
| Number of Observations | 502 | 502 | 502 | 502 | 502 | 502 | 502 | 502 |
| Kleibergen-Paap F-statistic | 19.62 | | 18.32 | | 1.27 | | 12.67 | |
| F-statistic | | 19.30 | | 20.74 | | 1.61 | | 17.69 |

**Panel B: Education**

| | Education Expenditure Per Child | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 3840.202* | | | | | | | |
| | (2253.21) | | | | | | | |
| Long financial decisions female | | | 3684.896* | | | | | |
| | | | (2112.05) | | | | | |
| Female head | | | | | 1.21e+05 | | | |
| | | | | | (341363.80) | | | |
| Female land title | | | | | | | 7096.877* | |
| | | | | | | | (4167.32) | |
| Far from Cherrapunji | | 0.419*** | | 0.437*** | | 0.013 | | 0.227** |
| | | (0.10) | | (0.10) | | (0.04) | | (0.08) |
| Number of Observations | 406 | 406 | 406 | 406 | 406 | 406 | 406 | 406 |
| Kleibergen-Paap F-statistic | 16.53 | | 14.48 | | 0.10 | | 7.62 | |
| F-statistic | | 17.19 | | 18.28 | | 0.12 | | 7.57 |

**Panel C: Temptation goods**

| | Temptation Goods Per Child | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -18.640 | | | | | | | |
| | (165.19) | | | | | | | |
| Long financial decisions female | | | -18.199 | | | | | |
| | | | (160.84) | | | | | |
| Female head | | | | | -208.268 | | | |
| | | | | | (1915.35) | | | |
| Female land title | | | | | | | -35.479 | |
| | | | | | | | (313.84) | |
| Far from Cherrapunji | | 0.453*** | | 0.464*** | | 0.041 | | 0.238*** |
| | | (0.11) | | (0.10) | | (0.04) | | (0.05) |
| Number of Observations | 471 | 471 | 471 | 471 | 471 | 471 | 471 | 471 |
| Kleibergen-Paap F-statistic | 17.83 | | 16.97 | | 0.74 | | 10.89 | |
| F-statistic | | 17.36 | | 19.77 | | 0.87 | | 18.94 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is defined as expenditures per child. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A15:** Female empowerment and savings: controlling for household size

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.646*** | | | | | | | |
| | (0.16) | | | | | | | |
| Long financial decisions female | | | -0.573*** | | | | | |
| | | | (0.15) | | | | | |
| Female head | | | | | -4.912 | | | |
| | | | | | (2.99) | | | |
| Female land title | | | | | | | -1.198*** | |
| | | | | | | | (0.42) | |
| Number of household members | -0.016** | -0.008 | -0.009 | 0.004 | -0.089** | -0.016*** | -0.012 | -0.001 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.04) | (0.01) | (0.01) | (0.01) |
| Female | 0.010 | 0.089** | -0.008 | 0.069** | 0.849* | 0.182*** | 0.110* | 0.131*** |
| | (0.04) | (0.03) | (0.05) | (0.03) | (0.46) | (0.04) | (0.06) | (0.03) |
| Age | 0.032 | 0.028** | 0.035** | 0.037*** | 0.129* | 0.023** | -0.011 | -0.021 |
| | (0.02) | (0.01) | (0.02) | (0.01) | (0.08) | (0.01) | (0.02) | (0.01) |
| Squared age | -0.000* | -0.000** | -0.001** | -0.000*** | -0.001 | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.249*** | -0.353*** | -0.207*** | -0.324*** | -0.883 | -0.175*** | -0.117 | -0.080** |
| | (0.07) | (0.04) | (0.07) | (0.04) | (0.54) | (0.06) | (0.08) | (0.03) |
| Number of children | -0.023* | -0.015 | -0.030*** | -0.030** | 0.016 | 0.006 | -0.024 | -0.009 |
| | (0.01) | (0.02) | (0.01) | (0.01) | (0.03) | (0.01) | (0.02) | (0.01) |
| Education | 0.006 | 0.006 | 0.001 | -0.001 | -0.036 | -0.008 | -0.000 | -0.002 |
| | (0.02) | (0.02) | (0.01) | (0.01) | (0.03) | (0.01) | (0.01) | (0.01) |
| Own land | 0.053 | -0.069 | 0.057 | -0.071 | -0.078 | -0.036 | 0.440*** | 0.286*** |
| | (0.11) | (0.08) | (0.08) | (0.05) | (0.19) | (0.03) | (0.13) | (0.07) |
| Income | 0.000 | 0.000 | 0.000 | -0.000 | 0.000 | -0.000 | 0.000 | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.084 | 0.010 | 0.037 | -0.071 | -0.125 | -0.041** | -0.009 | -0.073** |
| | (0.08) | (0.04) | (0.08) | (0.05) | (0.15) | (0.02) | (0.09) | (0.03) |
| Knows interest rate | -0.081 | -0.109* | -0.032 | -0.038 | -0.125 | -0.023 | 0.042 | 0.044 |
| | (0.12) | (0.06) | (0.10) | (0.03) | (0.38) | (0.06) | (0.09) | (0.07) |
| Knows bank deposit | 0.116* | 0.104** | 0.122* | 0.129** | 0.385* | 0.068*** | 0.082 | 0.028 |
| | (0.06) | (0.05) | (0.07) | (0.06) | (0.22) | (0.01) | (0.07) | (0.03) |
| Bank account | -0.014 | -0.016 | -0.010 | -0.010 | 0.304 | 0.063*** | 0.069 | 0.061*** |
| | (0.05) | (0.03) | (0.06) | (0.05) | (0.22) | (0.02) | (0.06) | (0.02) |
| Risk aversion | 0.146*** | 0.094 | 0.127* | 0.073 | 0.190 | 0.021 | 0.191*** | 0.088** |
| | (0.04) | (0.06) | (0.07) | (0.06) | (0.14) | (0.03) | (0.07) | (0.03) |
| Memory game | -0.009** | 0.002 | -0.011*** | -0.002 | 0.001 | 0.002 | -0.007 | 0.003 |
| | (0.00) | (0.00) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.040 | 0.045 | 0.012 | 0.002 | 0.157* | 0.030 | -0.038 | -0.041* |
| | (0.04) | (0.05) | (0.04) | (0.04) | (0.09) | (0.03) | (0.04) | (0.02) |
| Competitive | 0.049 | -0.026 | 0.072 | 0.011 | 0.139 | 0.015 | 0.006 | -0.050 |
| | (0.05) | (0.04) | (0.05) | (0.05) | (0.09) | (0.02) | (0.07) | (0.04) |
| Total population | 0.000 | 0.000*** | -0.000 | 0.000*** | -0.000 | -0.000 | 0.000 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 28.26 | | 30.75 | | 1.78 | | 14.95 | |
| F-statistic | | 19.18 | | 28.05 | | 2.16 | | 26.48 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A16:** Female empowerment and ln(expenditures)

**Panel A: Food**

| | ln(Food Expenditure) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 0.790*** | | | | | | | |
| | (0.23) | | | | | | | |
| Long financial decisions female | | | 0.705*** | | | | | |
| | | | (0.20) | | | | | |
| Female head | | | | | 5.668 | | | |
| | | | | | (4.35) | | | |
| Female land title | | | | | | | 1.469** | |
| | | | | | | | (0.65) | |
| Far from Cherrapunji | | 0.417*** | | 0.468*** | | 0.058 | | 0.224*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 27.57 | | 30.93 | | 1.89 | | 15.02 | |
| F-statistic | | 18.99 | | 28.16 | | 2.19 | | 26.16 |

**Panel B: Education**

| | ln(Education Expenditure) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -1.161** | | | | | | | |
| | (0.48) | | | | | | | |
| Long financial decisions female | | | -1.022** | | | | | |
| | | | (0.43) | | | | | |
| Female head | | | | | -16.673 | | | |
| | | | | | (23.72) | | | |
| Female land title | | | | | | | -1.993 | |
| | | | | | | | (1.27) | |
| Far from Cherrapunji | | 0.381*** | | 0.433*** | | 0.027 | | 0.222*** |
| | | (0.09) | | (0.09) | | (0.04) | | (0.06) |
| Number of Observations | 477 | 477 | 477 | 477 | 477 | 477 | 477 | 477 |
| Kleibergen-Paap F-statistic | 22.44 | | 23.42 | | 0.42 | | 11.72 | |
| F-statistic | | 16.90 | | 24.28 | | 0.46 | | 15.56 |

**Panel C: Temptation goods**

| | ln(Temptation Goods) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | 0.025 | | | | | | | |
| | (0.31) | | | | | | | |
| Long financial decisions female | | | 0.022 | | | | | |
| | | | (0.28) | | | | | |
| Female head | | | | | 0.258 | | | |
| | | | | | (3.07) | | | |
| Female land title | | | | | | | 0.051 | |
| | | | | | | | (0.63) | |
| Far from Cherrapunji | | 0.414*** | | 0.467*** | | 0.040 | | 0.202*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Number of Observations | 551 | 551 | 551 | 551 | 551 | 551 | 551 | 551 |
| Kleibergen-Paap F-statistic | 25.47 | | 28.94 | | 0.79 | | 11.37 | |
| F-statistic | | 16.07 | | 25.19 | | 0.85 | | 23.02 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. The control variables include Female, Age, Squared age, Married, Number of children, Education, Own land, Income, Computations, Knows interest rate, Knows bank deposit, Bank account, Risk aversion, Memory game, Short preferences, Competitive and Total population.

**Table A17:** Female empowerment and savings: IV with alternative controls

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short savings female | -0.634*** | | | | | | | |
| | (0.16) | | | | | | | |
| Long savings female | | | -0.564*** | | | | | |
| | | | (0.15) | | | | | |
| Female head | | | | | -4.606* | | | |
| | | | | | (2.57) | | | |
| Female land title | | | | | | | -1.197*** | |
| | | | | | | | (0.43) | |
| Far from Cherrapunji | | 0.417*** | | 0.469*** | | 0.057 | | 0.221*** |
| | | (0.10) | | (0.09) | | (0.03) | | (0.05) |
| Female | -0.004 | 0.067* | -0.012 | 0.061 | 0.816** | 0.187*** | 0.105* | 0.126*** |
| | (0.05) | (0.04) | (0.06) | (0.04) | (0.40) | (0.04) | (0.06) | (0.03) |
| Age | 0.032* | 0.024** | 0.035*** | 0.033*** | 0.133* | 0.025** | -0.008 | -0.021* |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.07) | (0.01) | (0.02) | (0.01) |
| Squared age | -0.000** | -0.000** | -0.000*** | -0.000*** | -0.001 | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.283*** | -0.422*** | -0.218** | -0.359*** | -0.763 | -0.162** | -0.130 | -0.095** |
| | (0.10) | (0.06) | (0.10) | (0.07) | (0.49) | (0.06) | (0.10) | (0.04) |
| Number of children | -0.037*** | -0.024 | -0.036*** | -0.026* | -0.070*** | -0.010*** | -0.034** | -0.010 |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.02) | (0.00) | (0.02) | (0.01) |
| Education | 0.006 | 0.006 | 0.002 | -0.001 | -0.023 | -0.005 | -0.003 | -0.004 |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.04) | (0.01) | (0.01) | (0.01) |
| Own land | 0.062 | -0.065 | 0.060 | -0.077 | -0.061 | -0.036 | 0.451*** | 0.291*** |
| | (0.10) | (0.08) | (0.07) | (0.05) | (0.17) | (0.03) | (0.14) | (0.07) |
| Income | 0.000 | 0.000 | 0.000 | -0.000 | -0.000 | -0.000* | 0.000 | -0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse earns income | 0.090 | 0.131** | 0.042 | 0.061 | -0.038 | -0.010 | 0.040 | 0.027 |
| | (0.09) | (0.06) | (0.09) | (0.07) | (0.21) | (0.04) | (0.08) | (0.04) |
| Bank account | -0.008 | -0.026 | 0.001 | -0.013 | 0.235 | 0.049** | 0.082 | 0.061*** |
| | (0.05) | (0.04) | (0.05) | (0.05) | (0.18) | (0.02) | (0.06) | (0.02) |
| Mobile banking | 0.098* | 0.110 | 0.024 | -0.008 | -0.114 | -0.031* | 0.166 | 0.115** |
| | (0.06) | (0.07) | (0.06) | (0.09) | (0.13) | (0.02) | (0.11) | (0.05) |
| Microcredit | -0.165** | 0.043 | -0.192** | 0.000 | 0.359 | 0.120*** | -0.221** | -0.024 |
| | (0.07) | (0.05) | (0.09) | (0.05) | (0.33) | (0.04) | (0.11) | (0.05) |
| Credit money lender | 0.092 | 0.154* | 0.100 | 0.188* | 0.066 | 0.016 | 0.020 | 0.022 |
| | (0.08) | (0.08) | (0.09) | (0.09) | (0.20) | (0.05) | (0.11) | (0.06) |
| Computations | 0.070 | 0.013 | 0.026 | -0.064 | -0.095 | -0.034** | -0.030 | -0.077** |
| | (0.07) | (0.03) | (0.08) | (0.04) | (0.12) | (0.01) | (0.08) | (0.03) |
| Knows interest rate | -0.078 | -0.087 | -0.035 | -0.021 | -0.134 | -0.024 | 0.032 | 0.046 |
| | (0.12) | (0.07) | (0.10) | (0.03) | (0.36) | (0.06) | (0.08) | (0.07) |
| Knows bank deposit | 0.112* | 0.107** | 0.121* | 0.136** | 0.357* | 0.068*** | 0.076 | 0.027 |
| | (0.06) | (0.05) | (0.06) | (0.06) | (0.19) | (0.01) | (0.07) | (0.03) |
| Risk aversion | 0.148*** | 0.091 | 0.125* | 0.062 | 0.168 | 0.017 | 0.205*** | 0.096** |
| | (0.05) | (0.07) | (0.07) | (0.06) | (0.13) | (0.03) | (0.07) | (0.04) |
| Memory game | -0.009** | 0.002 | -0.012*** | -0.003 | 0.000 | 0.002 | -0.007 | 0.003 |
| | (0.00) | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.054 | 0.052 | 0.022 | 0.002 | 0.173* | 0.033 | -0.024 | -0.037* |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.09) | (0.03) | (0.04) | (0.02) |
| Competitive | 0.051 | -0.033 | 0.075 | 0.005 | 0.135 | 0.014 | 0.010 | -0.051 |
| | (0.05) | (0.04) | (0.06) | (0.06) | (0.09) | (0.02) | (0.07) | (0.04) |
| Total population | 0.000 | 0.000*** | -0.000 | 0.000*** | -0.000 | -0.000 | 0.000 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 36.00 | | 44.05 | | 1.96 | | 10.06 | |
| F-statistic | | 18.37 | | 28.14 | | 2.79 | | 23.93 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not.

**Table A18:** Female empowerment and savings: IV controlling for occupation

| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -0.758*** | | | | | | | |
| | (0.18) | | | | | | | |
| Long financial decisions female | | | -0.656*** | | | | | |
| | | | (0.15) | | | | | |
| Female head | | | | | -5.990 | | | |
| | | | | | (4.23) | | | |
| Female land title | | | | | | | -1.258*** | |
| | | | | | | | (0.40) | |
| Far from Cherrapunji | | 0.387*** | | 0.447*** | | 0.049 | | 0.233*** |
| | | (0.10) | | (0.09) | | (0.04) | | (0.04) |
| Female | 0.060* | 0.090*** | 0.040 | 0.073* | 1.083 | 0.182*** | 0.159*** | 0.133*** |
| | (0.03) | (0.03) | (0.04) | (0.04) | (0.66) | (0.04) | (0.05) | (0.03) |
| Age | 0.011 | 0.021** | 0.016 | 0.031** | 0.106 | 0.019* | -0.039** | -0.027** |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.08) | (0.01) | (0.02) | (0.01) |
| Squared age | -0.000 | -0.000** | -0.000 | -0.000** | -0.001 | -0.000 | 0.000 | 0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.385*** | -0.393*** | -0.320*** | -0.356*** | -1.168* | -0.181*** | -0.171** | -0.067** |
| | (0.09) | (0.04) | (0.07) | (0.03) | (0.68) | (0.06) | (0.08) | (0.03) |
| Number of children | -0.036*** | -0.022 | -0.037*** | -0.025 | -0.071** | -0.009*** | -0.032 | -0.009 |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.03) | (0.00) | (0.02) | (0.01) |
| Education | 0.004 | 0.011 | -0.003 | 0.002 | -0.021 | -0.003 | 0.009 | 0.011* |
| | (0.02) | (0.02) | (0.01) | (0.01) | (0.05) | (0.01) | (0.01) | (0.01) |
| Own land | 0.016 | -0.076 | 0.020 | -0.081* | -0.152 | -0.038 | 0.407*** | 0.265*** |
| | (0.09) | (0.07) | (0.06) | (0.04) | (0.28) | (0.04) | (0.12) | (0.07) |
| Income | 0.000 | 0.000 | 0.000 | -0.000 | -0.000 | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.055 | 0.003 | 0.007 | -0.070 | -0.190 | -0.040*** | -0.025 | -0.061** |
| | (0.07) | (0.04) | (0.07) | (0.05) | (0.18) | (0.01) | (0.09) | (0.03) |
| Knows interest rate | -0.122 | -0.119* | -0.063 | -0.046 | -0.232 | -0.033 | -0.008 | 0.019 |
| | (0.11) | (0.06) | (0.09) | (0.04) | (0.46) | (0.06) | (0.08) | (0.07) |
| Knows bank deposit | 0.099* | 0.097* | 0.111* | 0.130* | 0.398 | 0.062*** | 0.071 | 0.036 |
| | (0.06) | (0.05) | (0.07) | (0.07) | (0.27) | (0.01) | (0.06) | (0.03) |
| Bank account | 0.000 | -0.018 | 0.006 | -0.012 | 0.429 | 0.069*** | 0.087* | 0.058*** |
| | (0.05) | (0.03) | (0.05) | (0.05) | (0.35) | (0.02) | (0.05) | (0.02) |
| Risk aversion | 0.160*** | 0.101 | 0.117 | 0.052 | 0.180 | 0.016 | 0.187*** | 0.083** |
| | (0.04) | (0.06) | (0.08) | (0.06) | (0.19) | (0.03) | (0.07) | (0.03) |
| Memory game | -0.009** | 0.001 | -0.011*** | -0.002 | 0.000 | 0.002 | -0.006 | 0.003 |
| | (0.00) | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.046 | 0.039 | 0.009 | -0.011 | 0.262* | 0.041 | -0.044 | -0.048* |
| | (0.03) | (0.04) | (0.04) | (0.03) | (0.15) | (0.03) | (0.04) | (0.03) |
| Competitive | 0.037 | -0.031 | 0.063 | 0.005 | 0.169 | 0.018 | -0.003 | -0.051 |
| | (0.05) | (0.04) | (0.05) | (0.05) | (0.12) | (0.01) | (0.07) | (0.04) |
| Total population | 0.000 | 0.000** | -0.000 | 0.000*** | -0.000 | -0.000 | 0.000 | 0.000*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 31.60 | | 39.07 | | 1.27 | | 12.25 | |
| F-statistic | | 16.47 | | 25.19 | | 1.56 | | 31.34 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy variable which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable used is a dummy variable measuring if the households reside in a village that is far from Cherrapunji (>68km) or not. Due to space constraints, we do not report the occupation coefficients.

**Table A19:** Female empowerment and savings: IV continuous distance to Cherrapunji

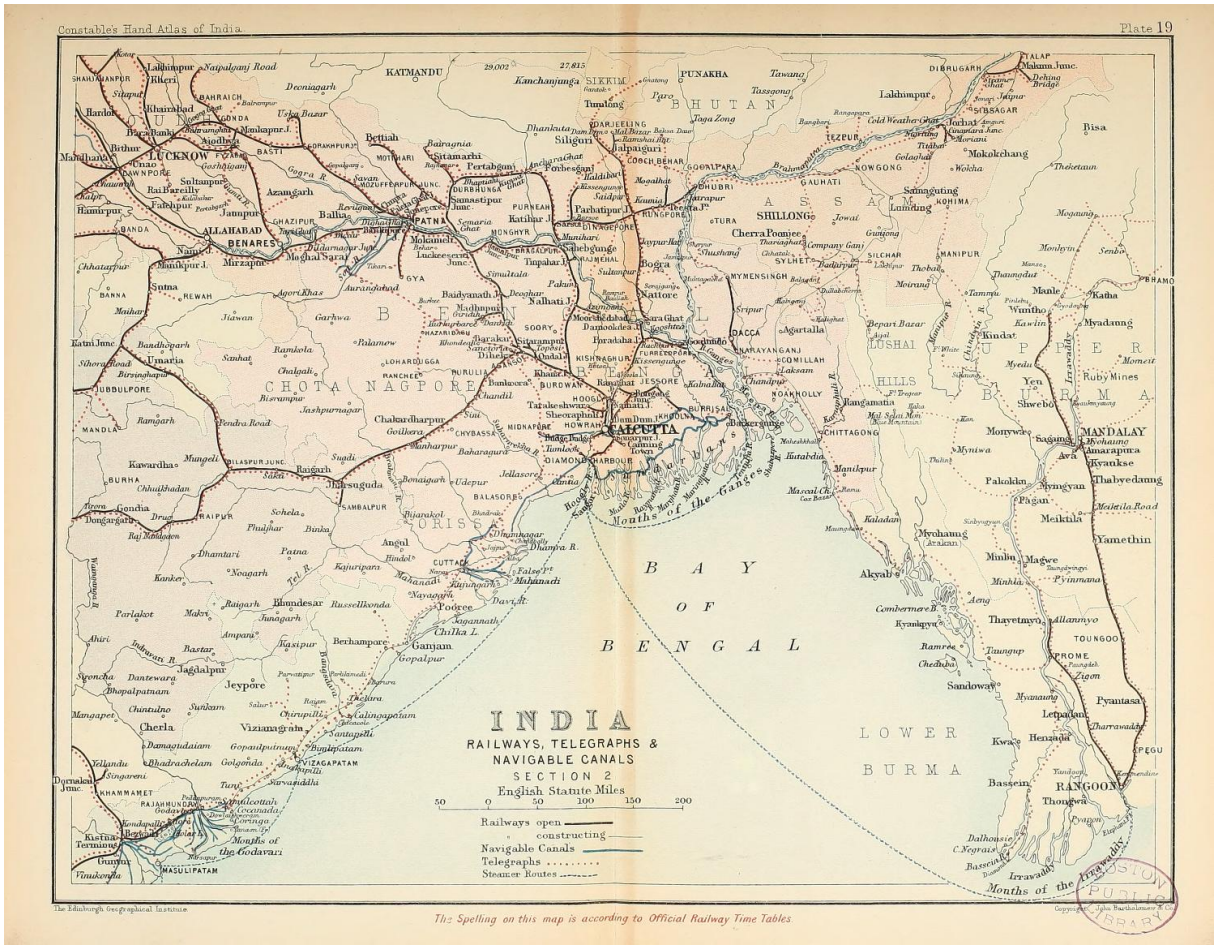
| | Savings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage | 2nd stage | 1st stage |
| Short financial decisions female | -1.255* | | | | | | | |
| | (0.66) | | | | | | | |
| Long financial decisions female | | | -1.092*** | | | | | |
| | | | (0.42) | | | | | |
| Female head | | | | | -8.073 | | | |
| | | | | | (10.20) | | | |
| Female land title | | | | | | | -1.766 | |
| | | | | | | | (1.08) | |
| Distance to Cherrapunji | | 0.003 | | 0.003 | | 0.000 | | 0.002* |
| | | (0.00) | | (0.00) | | (0.00) | | (0.00) |
| Female | 0.066 | 0.093*** | 0.028 | 0.071** | 1.448 | 0.186*** | 0.185 | 0.133*** |
| | (0.09) | (0.03) | (0.07) | (0.03) | (1.76) | (0.04) | (0.17) | (0.03) |
| Age | 0.051** | 0.029** | 0.053*** | 0.036*** | 0.222 | 0.026** | -0.021 | -0.020 |
| | (0.02) | (0.01) | (0.02) | (0.01) | (0.25) | (0.01) | (0.03) | (0.01) |
| Squared age | -0.001*** | -0.000** | -0.001*** | -0.000*** | -0.002 | -0.000 | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Married | -0.432** | -0.332*** | -0.353*** | -0.309*** | -1.340 | -0.164** | -0.145 | -0.073** |
| | (0.21) | (0.05) | (0.12) | (0.04) | (1.63) | (0.06) | (0.12) | (0.03) |
| Number of children | -0.052*** | -0.025 | -0.052*** | -0.028* | -0.098 | -0.009*** | -0.041* | -0.011 |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.09) | (0.00) | (0.02) | (0.01) |
| Education | 0.014 | 0.008 | 0.004 | 0.000 | -0.047 | -0.006 | 0.001 | -0.001 |
| | (0.03) | (0.02) | (0.02) | (0.01) | (0.07) | (0.01) | (0.01) | (0.01) |
| Own land | 0.016 | -0.062 | 0.021 | -0.067 | -0.163 | -0.032 | 0.605* | 0.289*** |
| | (0.13) | (0.09) | (0.09) | (0.06) | (0.48) | (0.04) | (0.35) | (0.07) |
| Income | 0.000 | -0.000 | -0.000 | -0.000* | -0.000 | -0.000* | -0.000 | -0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Computations | 0.063 | -0.031 | -0.023 | -0.115** | -0.297 | -0.049*** | -0.064 | -0.094*** |
| | (0.10) | (0.04) | (0.12) | (0.04) | (0.49) | (0.01) | (0.14) | (0.03) |
| Knows interest rate | -0.188 | -0.152*** | -0.085 | -0.081** | -0.276 | -0.035 | 0.046 | 0.024 |
| | (0.17) | (0.05) | (0.10) | (0.03) | (0.77) | (0.06) | (0.10) | (0.07) |
| Knows bank deposit | 0.203 | 0.141** | 0.214 | 0.172** | 0.599 | 0.071*** | 0.109 | 0.047 |
| | (0.16) | (0.06) | (0.15) | (0.07) | (0.71) | (0.01) | (0.10) | (0.03) |
| Bank account | -0.019 | -0.005 | -0.006 | 0.006 | 0.476 | 0.061*** | 0.106 | 0.067*** |
| | (0.07) | (0.03) | (0.08) | (0.05) | (0.66) | (0.02) | (0.09) | (0.02) |
| Risk aversion | 0.222* | 0.108 | 0.183** | 0.088 | 0.274 | 0.023 | 0.250** | 0.093** |
| | (0.13) | (0.07) | (0.09) | (0.07) | (0.29) | (0.03) | (0.12) | (0.03) |
| Memory game | -0.010** | -0.000 | -0.015** | -0.005 | 0.006 | 0.002 | -0.006 | 0.002 |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.02) | (0.00) | (0.01) | (0.00) |
| Short preferences | 0.058 | 0.013 | -0.002 | -0.040 | 0.296 | 0.031 | -0.066 | -0.061*** |
| | (0.06) | (0.05) | (0.07) | (0.05) | (0.31) | (0.03) | (0.09) | (0.02) |
| Competitive | 0.039 | -0.021 | 0.082 | 0.015 | 0.204 | 0.017 | -0.019 | -0.047 |
| | (0.07) | (0.05) | (0.08) | (0.06) | (0.20) | (0.02) | (0.09) | (0.04) |
| Total population | 0.000 | 0.000 | -0.000 | 0.000 | -0.000 | -0.000** | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Number of Observations | 624 | 624 | 624 | 624 | 624 | 624 | 624 | 624 |
| Kleibergen-Paap F-statistic | 4.35 | | 6.09 | | 0.63 | | 4.87 | |
| F-statistic | | 1.64 | | 2.73 | | 0.58 | | 3.52 |

*Notes:* 2SLS estimates reported with robust standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a dummy which equals to one if individuals report that they have savings left at the end of the month and zero otherwise. In each column, one measure of female empowerment is used. In column (1) a dummy for whether a female is responsible for short-term financial decisions, in column (2) a dummy for whether a female is responsible for long-term financial decisions, in column (3) a dummy for whether a female is the household head and in column (4) a dummy for whether the land title is in the name of a female. The instrumental variable is the continuous distance to Cherrapunji.

**Figure A2:** Location of Christian Mission Stations in India (1893)


The map shows location of Christian Missions in India as of 1893. Source: Constable's Hand Atlas of India (1893).

**Figure A3:** Existing Infrastructure in India in 1893: Railways, telegraphs and navigable canals




The figure shows the availability of railways, telegraphs and navigable canals in India in 1893 from the Constable's Hand Atlas of India (1893).