

Guérin, Isabelle; Nordman, Christophe Jalil; Reboul, Elena

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## The Gender of Debt and Credit: Insights from Rural Tamil Nadu

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# The Gender of Debt and Credit: Insights from Rural Tamil Nadu

**Isabelle Guérin**

*French National Research Institute for Sustainable Development (IRD),  
CESSMA (IRD, INALCO, Université de Paris) and IFP*

**Christophe Jalil Nordman**

*French National Research Institute for Sustainable Development (IRD),  
LEDa-DIAL (IRD, CNRS, PSL Research University), IZA and IFP*

**Elena Reboul**

*CESSMA (IRD, INALCO, Université de Paris)*

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**IZA – Institute of Labor Economics**

Schaumburg-Lippe-Straße 5–9  
53113 Bonn, Germany

Phone: +49-228-3894-0  
Email: [publications@iza.org](mailto:publications@iza.org)

[www.iza.org](http://www.iza.org)

## ABSTRACT

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### **The Gender of Debt and Credit: Insights from Rural Tamil Nadu**

The champions of financial inclusion regret women's lack of access to credit, while critics of financialization, by contrast, claim that women have become overly indebted. But little is actually known about women's debt/credit in quantitative terms, mostly due to a lack of data. This descriptive paper uses first-hand survey data from southern India disaggregated by sex in order to analyze the gender of debt and its interplay with caste and poverty, based on descriptive statistics and econometric results. We show that women are heavily indebted, first and foremost to informal sources, alongside microcredit. While men are much higher earners, they borrow much less in relative terms. Furthermore, women prominently - and markedly more so than men - borrow in order to make ends meet; productive investment largely remains a male practice. Lastly, women of the poorest and lowest-caste households have the heaviest borrowing responsibilities, managing the highest proportions of household debt. On a theoretical level, these results highlight the gendered earmarking of debt and credit: male and female debts/credits do not have the same meanings and uses. They also confirm the gendered dimension of behavior, in as much as women's behavior is constrained by family affiliation, poverty level and caste, all of which affects men much less. Last, in terms of policy implications, these results put into question the specific targeting of women by microcredit policies, likely to strengthen the association between debt and poverty for women, and in particular to exacerbate female responsibilities for managing scarcity.

**JEL Classification:** G51, O16, J16, D14

**Keywords:** gender, debt, poverty, caste, microcredit, India

**Corresponding author:**

Christophe Jalil Nordman

DIAL

4 rue d'Enghien

75010 Paris

France

E-mail: [nordman@dial.prd.fr](mailto:nordman@dial.prd.fr)

# Introduction

Based on a case study in South India, this paper discusses the gender of debt and credit and its interplay with other forms of inequality, namely class and caste. Do poor women have too much debt or not enough access to credit? Debt and credit are two sides of the same coin, but the choice of terms reflects the ambivalence of the debt/credit dyad, either protective, productive, or destructive depending on how and why it is used (Peebles, 2010). This ambiguity underpins the current debates about financial inclusion, particularly concerning women. Proponents of “financial inclusion” focus on credit as a potential tool for business creation, improved access to education and health, enhanced decision-making and women’s “empowerment” more generally. As such, the call for more credit for women continues to be upheld among various international organizations (Demirgüç-Kunt et al. (2018); UNCDF (2019)), even if microcredit has been strongly criticized and is no longer viewed as a miracle cure (Cull and Morduch (2017); Hudon et al. (2019))<sup>1</sup>. Regarding gender, several meta-analyses have converged to produce mixed, and at best modest, results; this heterogeneity reflects the diversity of users (“women” is an extremely diverse category), contexts and methods used (Garikipati et al., 2017b). Financial inclusion critics have by contrast stressed the “debt” dimension<sup>2</sup> and raised concern about finance’s increasing material and symbolic hold over both production and daily life, in what is now referred to as “financialization”. To this regard, a growing body of feminist research has condemned the financialization of social reproduction (by which is meant any work or activity needed to sustain existing life and reproduce the next generation)

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<sup>1</sup>CGAP, the leading network for the identification of good practices and training, announced in 2019 the need for a “new impact narrative”, insisting not on the absence of effects (which is the conclusion of randomized trials - see Banerjee et al. (2015) -, but the external validity of their results is highly controversial (Bédécarrats et al., 2020)) but on the diversity of effects according to contexts and methods. See <https://www.cgap.org/research/publication/toward-new-impact-narrative-financialinclusion\#:~:text=New\%20theory\%20of\%20change,some\%20and\%20critiqued\%20by\%20others>.

<sup>2</sup>Critics consider microcredit and financial inclusion policies in the Global South as a development tool which “doesn’t work” (Bateman, 2010), as it transforms the poor into capital (Roy, 2010), financializes poverty (Mader, 2015), and leads to the collateralisation of social policies (Lavinias et al., 2017). Some ethnographies confirm this risk (Elyachar (2005); Karim (2011)), others are more nuanced by showing how microcredit mainly transforms social relations, including gender relations, with effects that are variable and unpredictable (Morvant-Roux (2014); Villarreal (2014); Schuster (2015); James (2015); Kar (2018); Saiag (2020)).

and stressed how this primarily affects women, bringing about new forms of control over women's bodies through forced labor for debt repayment, and the exacerbation of gender differences in how risks are assessed (Rankin (2013); Roberts (2015); Fraser (2017); Predmore (2020)).

Drawing on data from a small-scale household survey in rural Tamil Nadu, this paper discusses the actual modalities of women's debts, about which little is known, especially from a quantitative perspective, and goes missing from these debates. Critical analyses of gendered financial inclusion and financialization have tended to be either theoretical or carried out at the macro level, and rarely based on survey microdata. Empirical studies of microcredit impact abound (Cull and Morduch (2017); Hudon et al. (2019)), but while it is now well-known that microcredit does not operate in a vacuum (Collins et al., 2009), very few closely examine all sources of women's debt (for an example, see Garikipati et al. (2017a)). Beyond this literature, it has been well-documented that the propensities to get into debt and face repayment difficulties stem from specific circumstances (including life cycle position, unexpected shocks ranging from healthcare issues to a drop in income due to marital breakdown) and social belonging (working classes and marginalised communities being more vulnerable to indebtedness)<sup>3</sup>; but gender inequalities have remained a blind spot.

This gap stems from both conceptual and methodological obstacles. Bearing witness to the tenacity of the unitary household model, despite strong challenges from feminist criticism Folbre (1986), national household surveys on financial practices widely record debt at the level of the household unit. The exception of student loans, mostly recorded at the borrower level, allowed to show that women struggle more to repay their education debts in the United States and Canada (Miller (2017); Chapman and Lounkaew (2015); Schwartz and Finnie (2002)). Quantitative evidence about female-headed households' debt has been mixed, depending on the country and the measure of indebtedness or over-indebtedness under consideration (Daniels (2001); Warren (2002); Brown and Taylor

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<sup>3</sup>See Westbrook et al. (2000); Kempson et al. (2004); Warren (2004); Worthington (2006); Lyons and Fisher (2006); Del-Río and Young (2008); Disney et al. (2008); Brown and Taylor (2008); Chiteji (2010); Caputo (2012); Grinstein-Weiss et al. (2016).

(2008); Bryan et al. (2010)) and the implications in terms of gender are hard to read, given female heads' great heterogeneity. There is some quantitative individual-level evidence on the impact of sex on financial hardship (Westaway and McKay (2007); Caputo (2012); Patel et al. (2012); Oksanen et al. (2015); Dunn and Mirzaie (2016)), which has been mixed for the same reasons. But as these studies have approached individuals as atomized entities, the gender of intra-household debt distribution has remained unaccounted for.

This article addresses this gap on the basis of sex-disaggregated survey data, collected in 2016-2017 from 464 households (1610 adults) in four rural districts of Tamil Nadu. Intensive microcredit and financial inclusion policies have been implemented over the past two decades in South India (NABARD (1992); Kalpana (2016); Nair (2017); Kar (2018)); women are, however, still presented as credit rationed (Ghosh and Vinod, 2017). Due to the nature of the data, the analyses presented in this paper do not claim external validity. When drawing on a such small-scale survey, what is lost in generalisability is yet gained in sharpness. Comprehensive and detailed data are here leveraged to document and discuss processes and the complexity of causality mechanisms, and propose theoretical insights on the gender of the dyad credit/debt. Our approach is descriptive, based on summary statistics and econometric results. Taking into account all types of debt source classified here as informal, microcredit and bank<sup>4</sup> - we pinpoint who gets into debt, from whom, for what purposes, with which income, and whether these various facets of indebtedness display a gender dimension. We examine women's borrowing responsibilities at the extensive and intensive margins, asking which women borrow and which shoulder the highest proportions of household debts. In particular, by conducting an intersectional analysis, we consider how women's borrowing responsibilities are shaped by poverty (namely the level of household per capita income) and caste. We compare Dalit individuals (or Scheduled Castes, ex untouchables) to non Dalit since data do not allow finer-grained distinctions.

Research on the intra-household economy has highlighted the variety of ways in which money (chiefly income) has been pooled, managed and controlled within the household,

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<sup>4</sup>Informal debts are unregulated by the State and have the particularity of being negotiable. Microcredit, which has both informal and formal features, has been isolated in order to study its possible specificities. Banks are the only purely formal sources.

underpinning gendered systems of rights and obligations. Despite their diversity Yodanis and Lauer (2007), intra-household financial arrangements show recurrent patterns. First, spending responsibilities tends to be gendered: expenditures related to daily consumption and on children are generally seen as a female responsibility, while men tend to be in charge of larger economic decisions, high-cost purchases or business investments (among many others, Nyman (1999); Vogler et al. (2008)). Secondly, male and female incomes tend to be earmarked and put to different purposes (Zelizer, 1994). What about debt? Microcredit studies have demonstrated that women’s loans, intended for investment, have been routinely used to ensure social reproduction (for example Noponen (1992); Holvoet (2005); Garikipati (2008)). Debt use is likely to mirror the division of spending responsibilities, but also reflects intra-household power relations, as made clear by practices of husbands diverting women’s microcredits (Goetz and Gupta, 1996). The fact that women tend to resort to different credit sources than men, overrepresented in informal finance in the global South or in fringe banking in the North<sup>5</sup>, is certainly the product of social and economic inequalities; but different patterns of demand need also to be accounted for (Johnson, 2004). The current striking overlap between female credit circuits and the credit circuits of the poor in various places of the world<sup>6</sup> echoes historical insights into the involvement of poor women in credit markets to ensure household survival going back to early modern Europe (Lemire et al. (2001); Fontaine (2008)). Household budget management, that is making ends meet and ensuring bills are paid, tends to fall on women’s shoulders when money is short, namely when the task is the most challenging<sup>7</sup>.

Our particular attention to poor women’s situation is thereby motivated by both public policy and theoretical concerns. Development policies currently target poor women with multiple financial schemes; yet as budget managers - and as such, scarcity managers -

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<sup>5</sup>For a worldwide view of women’s financial inclusion, see Demirgüç-Kunt et al. (2015). For payday loans in the United States see Martin and Longa (2011); Schmitz (2014); Chatterjee and Goetz (2009). For subprime mortgages, see Fishbein and Woodall (2006), Phillips (2012), Dymski et al. (2013).

<sup>6</sup>Typically pawnshops in the North (Johnson and Johnson (1998); Collard et al. (2013); Crédit Municipal de Paris (2016), or high-cost doorstep credit providers, from ambulant moneylenders in India (Garikipati et al., 2017a) to home credit or catalogue credit in the United Kingdom (Ford and Rowlingson (1997); Bermeo and Collard (2018)).

<sup>7</sup>See Rubin (1976), Dwyer and Bruce (1988), Komter (1989); Pahl (1990), Vogler and Pahl (1994), Siblot (2006), Thorne (2010).



these women may be already particularly vulnerable to debt. In the context of our case study, class inequalities overlap with caste inequalities. Furthermore, while caste shapes credit sources, segmenting local informal credit circuits and affecting access to formal finance (Harris-White and Colatei (2004); Chavan (2007, 2008); Kumar (2013)), it also modulates gender norms to some extent. In particular, given that working for pay outside the home has historically been, and still is regarded, as degrading and a marker of low social status (Eswaran et al. (2013); Rao (2014); Heyer (2015)), women work more often for pay when they are poor, out of necessity, or Dalit, facing less stringent norms of ritual purity (Carswell (2016); Srivastava and Srivastava (2010); Deshpande (2011)). Kapadia (1997) also observed, in Tamil Nadu, that norms of breadwinning and women’s autonomy (notably control over their earnings) were differentiated along the lines of caste. But caste-based patterns of female borrowing remain an under-explored field.

Our results suggest that debt is gendered in as much as women’s debt does not respond to the same constraints, nor have the same meaning as men’s debt. Four main results emerge. First, women are far more deeply in debt than men relatively to their income. Secondly, while male loans are more often used to invest and project themselves into the future, most of women’s loans is simply intended to help make ends meet. Women also more often use their loans to repay other loans, which may indicate that they struggle more to repay, or reflect their role as budget managers with potential responsibility for household debt management (Guérin et al. (2019); Carswell et al. (2020); Guérin and Kumar (2020)). Thirdly, women’s borrowing responsibilities appear to be strongly correlated with household poverty. Last, debt burden differentiates along caste lines, even controlling for discrepancies in per capita household income.

The remainder of this paper is organized as follows. The first two sections present the data and context, offering a preliminary overview into the gender of debt on the basis of descriptive statistics. The third and fourth section turn to econometrics to explore the roles of gender, poverty and caste, and intersectionality effects. We firstly analyze the drivers behind resorting to debt among both men and women (extensive margin). Then we investigate the determinants of the size of individually held household debt share

(intensive margin). The final section discusses these results and their theoretical and policy implications.

## 1 Data

The quantitative analyses presented in this paper draw on a household survey (Networks, Employment, Debt, Mobilities, and Skills in India Survey (NEEMSIS))<sup>8</sup> carried out in rural Tamil Nadu, in 2016/2017 by two authors of this paper. This survey stands out from other Indian data sources such as the All India Debt and Investment survey, as it has the rare and valuable advantage of recording debt at the individual level (identifying the person who went to the lender and borrowed in her own name).

This survey was the second wave of a longitudinal data collection project. It covered a mostly agricultural area on the border between Villupuram and Cuddalore<sup>9</sup> districts, which include two industrial towns (Neyveli and Cuddalore) and a regional business center (Panruti). The region was selected because it exhibits several key tendencies in the State: strong diversification of rural activities, the rise of rural trade centers and some degree of industrialization, and various forms of agrarian transition, spanning from peri-urbanized villages, and villages that remain largely agricultural. The 2010 first wave randomly selected 405 households in 10 villages (from 175 to 500 households in size), using a stratified sampling framework based on land characteristics, proximity to small towns (Panruti (60 000 inhabitants), Villupuram (120 000), Cuddalore (180 000)), and caste. Half of villages are irrigated, the other half have dry lands; within villages, half of the sample was selected from the mostly upper- and middle-caste Ur part of the village, and the other half from the Colony part, where Dalits mainly live.

In this first wave, data on financial practices were not disaggregated by gender. As such, we exclusively use the second wave (NEEMSIS), which recovered 388 households (4.3% attrition rate) and randomly selected 104 new households from these 10 villages,

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<sup>8</sup>9 For more details, see <https://neemsis.hypotheses.org/>.

<sup>9</sup>10 These villages are not meant to be representative of these two specific districts (not to mention Tamil Nadu in general). The surveyed villages being located at the border between the two districts, it is noteworthy that they were not affected at all by the flood which affected the Cuddalore district in november 2015, and mainly damaged the coastal zones.

based on the same method. Given that some households had migrated elsewhere between the 2010 and 2016-17 sampling periods (13% of the recovered households), the final sample is spread across 15 locations<sup>10</sup> in four districts. Data are not weighted: since the last Indian census has been conducted in 2011, the precise composition of villages at the time of the survey, for example in terms of caste, is unknown. According to the 2011 Census, Dalits are oversampled (accounting for roughly one and a half time their actual weight in 2011); however, due to the current processes of migration of upper castes to towns, the weight of Dalits is likely to be larger in 2016-17 than in 2011.

Almost half the sample (42%) has been interviewed after the November 2016 demonetisation. We do not study its impact, but control for it in the analysis, as the shock disrupted local financial circuits with consequences potentially differentiated along sex and caste lines<sup>11</sup>.

As far as financial practices are concerned, all outstanding loans at the time of the survey were recorded, from credit by neighbour to bank loan, and this paper examines the totality of this stock of debt. Debt data are notoriously difficult to collect, and prone to underreporting due to recall issues and social desirability biases (Karlan and Zinman (2008); Zinman (2009); Brown et al. (2011)). Measurement errors are even more likely for women as they often juggle multiple small and sometimes hidden loans (Johnson (2004); Garikipati et al. (2017a)). Here, beyond adopting a tablet-based mode of data collection that improved data quality in general (notably including constraints on answers to prevent inconsistencies), several precautions have been taken to limit these particular biases. The strong contextual awareness the team brought, thanks to having carried out numerous quantitative and qualitative surveys in the region for over a decade, helped to formulate

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<sup>10</sup>13 villages and 2 “areas”: in order to ensure a minimal number of observations per location, migrant households who settled in villages less than 5 kilometers away one from another were gathered together in a same area for the analysis.

<sup>11</sup>See Guérin et al. (2017) for a discussion of the impact with these data and qualitative field work. Overall, the average number and amount of loans per household did not increase with demonetisation. But some sources of credit supply reduced (from some microfinance organisations or banks to some small shopkeepers running out of cash) while others thrived (advances of employers trying to get rid of old notes, informal moneylending between neighbours, cash recycling through women’s SHG...). From the demand side, on the one hand, some segments of the population had to borrow to meet cash shortages, notably Dalits who tended to have lower cash surpluses; on the other hand, women who had secret saving money were compelled to withdraw it in order to convert the notes.

questions appropriately. This for instance involved using particular terms that are less degrading than the generic term “debt” (*kadan* in Tamil), lists of the main local lenders, and asking indirect questions. Improved data accuracy is for example reflected by an incidence of indebtedness found higher than in the estimates of the nation-wide All India Debt and Investment Survey: as will be discussed below, 99% of households are in debt in our case study, as opposed to 30% in rural Tamil Nadu in 2012 according to the AIDIS (Office, 2014). Last, women were interviewed separately for the financial module of the household questionnaire, while one respondent per household completed the remainder (often the household head). As the rest of the family is generally unaware of female debt in the household (and rarely the other way around), this is the only means of obtaining reasonably reliable data.

## 2 Descriptive statistics

### 2.1 Labour and financial landscape

Our final sample consists of 484 households and 1610 adults once missing observations are deleted. Dalits (or Scheduled Castes, ex-untouchables) and middle castes (mostly Vanniyars) are the most prominent social groups<sup>12</sup>; upper castes (Mudaliyars, Naidus, Reddiyars, Settus), who are progressively leaving for towns, account for 12% of the households. As elsewhere in the country, caste marks a deep line of economic inequality. 70% of households are landless, but only 20% of Dalit households have land, as opposed to 40% of non Dalit, and with two times smaller plots on average. Their mean non-land assets and household per capita income<sup>13</sup> amount to roughly half and two thirds of those of non Dalit respectively (Table 1).

Household per capita income amounts to Rs. 102 a day on average in the sample, i.e. \$1.5 a day in simple market rates conversion. In what follows, in order to measure

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<sup>12</sup>13 Muslims and Christians are in minority in the region (10 households in our sample).

<sup>13</sup>Household non land assets include house(s), household goods, livestock and agricultural equipment value, alongside bank and gold savings. Per capita household income is the sum of labour incomes, government transfers, and remittances received the year preceding the survey, divided by the number of household members.

inequalities and provide telling illustrations of econometric results, individuals are compared at different points of the distribution of household per capita income. These cutoff points are the threshold between the first and second quartile (Rs. 43, i.e. between the Tendulkar national rural poverty line of Rs. 32 and \$1 a day) and between the third and fourth (Rs. 133). Household per capita income averages Rs. 28 in the first quartile (where two thirds of households are Dalit) and Rs. 219 in the last (where one third of households are Dalit).

Casual work accounts for a large proportion of employment, especially for women (Table 2), making for both low and volatile incomes. Over-represented in unpaid labour, from housewifery to activity in family farm or business, women are generally engaged in part-time, subsidiary employment when working for pay. The median income of women income-earners is equal to the 7th percentile of male incomes. Only 13% of female workers make most of their income with regular work (as opposed to 33% of males), and the National Rural Employment Guarantee Scheme (NREGS)<sup>14</sup> represents a notable source of female labor and income. One third of women who work for money make most of their earnings with this program, as opposed to 2% of men.

As a consequence of both supply- and demand-side factors, combining gender norms and the availability of mainly hard and poorly paid labour to women, female employment is markedly differentiated across classes and castes. Women are more likely to work for pay in low-income households, out to necessity, and in Dalit households (Table 1): Dalit women face lower restrictions on their mobility and their labor is generally more socially accepted.

Given these low and irregular incomes, resorting to debt is the norm. 99% of households have unsettled debt at the time of the survey (Table 1). That women get involved is far from unusual, and affects three quarters of households (77%). Overall, adult men and women are roughly equally likely to be in debt: 56% and 58% respectively have unsettled loans at the time of the survey (Table 2). In turn, the male head of the household is

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<sup>14</sup>Launched in 2006, the programme proposes to each household one hundred days of manual employment yearly, on public works such as road and tanks maintenance, at a gender-blind minimum wage rate.

Table 1: Household-unit descriptive statistics

	MEANS FOR:					
	All households	First quartile	Fourth quartile <sup>1</sup>	Dalits	Middle castes	Upper castes
<i>Socio-economic characteristics:</i>						
Dalit	0.483	0.636	0.339			
Middle caste	0.397	0.339	0.512			
Upper caste	0.120	0.0248	0.149			
Female-headed household	0.0806	0.0744	0.0661	0.0983	0.0729	0.0345
Joint household	0.393	0.430	0.298	0.376	0.396	0.448
Daily household per capita income (Rs.)	101.9	28.41	218.8	83.92	114.5	132.4
Female share of household income	0.221	0.309	0.190	0.280	0.186	0.103
Household owning land	0.306	0.306	0.331	0.201	0.443	0.276
Among owners: mean land size (acre)	2.486	1.398	4.175	1.465	2.644	4.647
Household non land assets (Rs.)	506,533	339,675	716,194	311,734	664,051	771,007
<i>Financial practices:</i>						
Unbanked household (no bank account)	0.047	0.016	0.116	0.060	0.036	0.034
Household indebted at the time of the survey	0.994	0.992	0.992	0.991	1	0.983
Outstanding debt to annual income ratio	1.972	3.679	0.885	1.624	2.428	1.873
Debt sources: As shares of outstanding debt:						
Microcredit debt (SHG and MFI)	0.060	0.066	0.025	0.067	0.065	0.013
Informal debt	0.866	0.861	0.837	0.889	0.839	0.861
Formal debt (bank)	0.072	0.071	0.133	0.041	0.092	0.129
Number of adults indebted	1.886	1.917	1.826	1.885	1.911	1.810
Who is in debt in the household:						
Only female head	0.041	0.058	0.033	0.056	0.036	0
Only male head	0.188	0.140	0.273	0.167	0.198	0.241
Only female spouse	0.060	0.107	0.033	0.081	0.036	0.052
Only male head and female spouse	0.426	0.463	0.364	0.410	0.474	0.328
Other arrangements	0.279	0.223	0.289	0.278	0.255	0.362
No debt	0.006	0.008	0.008	0.008	0	0.017
Female debt > 0	0.771	0.843	0.645	0.799	0.766	0.672
Female share of household debt	0.361	0.420	0.256	0.411	0.326	0.275
Number of observations	484	121	121	234	192	58

Source: NEEMIS survey (2016-17), authors' compilation.

<sup>1</sup> First and fourth quartiles: lowest and highest quartiles respectively of household per capita income (cutoff points are Rs. 32 and 133 a day)

<sup>2</sup> Per capita household income: sum of labour incomes, government transfers and remittances received, divided by the number of household members

<sup>3</sup> Non land assets: house(s), household goods, livestock, agricultural equipment, bank and gold savings

the sole debtor in only one household out of five (19%). In half the cases (51%), male household heads and their wives are both indebted, either alone (42% of the total cases) or together with other household members (often a son and occasionally a daughter-in-law in joint households). As a result of the financial inclusion policies implemented over the

last two decades in the region, only 4% of households are unbanked (by which is meant that no household member has a bank account), and three quarters of adults have at least one bank account, with no significant gender differences in ownership (Table 2). Female accounts<sup>15</sup> are still more often used to receive money from government schemes, typically NREGS' wages which are directly transferred into bank accounts. Banks still occupy a marginal position in the credit landscape: 84% and 67% of male and female debtors respectively have exclusively informal outstanding debt (Table 2).

But while informal finance remains a key feature of rural financial landscape (Nair, 2017) and caste remains a powerful regulator of borrowing relationships Guérin et al. (2013), debt sources have significantly evolved and diversified in rural south India over the second half of the last century. The profile of lenders has diversified considerably. Pawnbroking, which had long been the preserve of specific lending castes, has opened up to other communities. Pawnbrokers are here classified as informal lenders, while some are licensed and their activity is regulated by the state. Respondents are unaware of this, and more importantly, pawnbrokers, whether regulated or not, offer negotiable contracts. It therefore makes sense to classify them as informal. In our sample, 75% of female debtors (4% of males) have some gold pledged by a pawnbroker at the time of survey. Commuting to urban areas also has opened up new opportunities: workers can obtain loans from their workplace, especially from their colleagues, bosses or contractors (19% of male debtors are in debt by labour relations, only 2% of females).

New players have also come in and stand out in that they mostly target women. While women have always been excluded from any form of formal finance (13% and 5% of male and female debtors respectively have outstanding bank loans in our sample), this is something genuinely new. The feminisation of the market started in the late 1990s, with the Self-Help-Group model (SHG)<sup>16</sup> (bolstered by active public policy and multilateral agency support) and the growth in microcredit supply, mostly from for-profit organisa-

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<sup>15</sup>Joint accounts are almost nonexistent in our data (1% of adults).

<sup>16</sup>A SHG consists of 15 to 20 women who circulate money amongst one another, and are then eligible for external loans provided by NGOs, banks or non-banking financial companies. In 2010 in Tamil Nadu, it was estimated that almost half families (44%), and almost one fifth (18%) of the female adult population, belonged to at least one SHG (see <http://ifmrlead.org/map-of-microfinance>) and in 2017, almost one million of SHG had been created in Tamil Nadu (Bharat Microfinance Report 2017).

Table 2: Individual-unit descriptive statistics, by sex

	MEANS FOR ALL ADULTS:			
	Men	Women	Diff	
Daily household per capita income (Rs.)	109.4	96.60	12.75**	[2.76]
Never married	0.279	0.135	0.143	(7.07)
Education:				
No school	0.168	0.358	$\chi^2(2) = 85.11^{***}$	
Primary education	0.344	0.326		
Secondary or more	0.487	0.317		
Main occupation:				
Agricultural self-employment	0.148	0.033	$\chi^2(5) = 334.10^{***}$	
Non agricultural self-employment	0.138	0.060		
Casual labour	0.263	0.306		
NREGS	0.024	0.244		
Regular labour	0.283	0.095		
No paid labour	0.144	0.260		
Individual annual income (Rs.)	72,933	18,335	54,598***	[13.77]
Unbanked (no bank account)	0.232	0.238	-0.006	(-0.30)
Indebted at the time of the survey	0.576	0.557	0.019	(0.77)
Number of observations	833	777		
	MEANS FOR DEBTORS:			
	Men	Women	Diff	
Never married	0.073	0.037	0.036*	(2.36)
Outstanding debt (Rs.)	138,844	63,025	75,819***	[8.02]
Number of outstanding loans	2.51	1.92	0.587***	[6.33]
Share of household debt	0.638	0.401	0.237***	[11.31]
Share of household income	0.576	0.179	0.397***	[22.37]
No income	0.039	0.173	-0.134***	(-6.63)
Debt sources: Being in debt to:				
Informal sources	0.940	0.921	0.018	(1.07)
Informal sources only	0.840	0.670	0.170***	(5.99)
Microcredit (SHG or MFI)	0.033	0.296	-0.262***	(-10.86)
Informal sources & microcredit	0.023	0.236	-0.212***	(-9.74)
Bank	0.133	0.048	0.084***	(4.40)
Detailed informal debt sources: Being in debt to:				
“Well-known person” <sup>1</sup>	0.571	0.187	0.389***	(11.88)
Relative	0.342	0.129	0.212***	(7.49)
Labour relation	0.192	0.025	0.166***	(7.93)
Pawn-broker	0.037	0.753	-0.715***	(-22.27)
Shop-keeper	0.010	0.013	-0.003	(-0.47)
Moneylender	0.140	0.118	0.022	(0.98)
Friend, neighbour	0.148	0.046	0.102***	(5.12)
Number of observations	480	433		
	DEBTORS INCOME-EARNERS:			
	Men	Women	Diff	
Mean debt-to-annual income ratio	2.86	9.30	-6.44***	[-4.55]
Median debt-to-annual income ratio	1.13	2.91	-1.84***	[-6.89]
Number of observations	461	358		

[t-stat], (z-stat), \* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001

Source: NEEMSIS survey (2016-17), authors' compilation.

<sup>1</sup> Local term referring to a non-professional lender with whom the borrower has a personal relationship.



tions<sup>17</sup>. SHGs are present in every surveyed village (between 4 and 20 per village, i.e. 1 group for every 25 to 75 families). In our sample, out of 184 outstanding microcredits, 20% have been declared as contracted through SHGs, and the remainder by various microfinance institutions (MFIs), prominently Equitas and Ujivan, through individual or group lending. In our context of study, the boundaries between SHG loans and microcredit from “for-profit” microfinance institutions (MFIs) tend still to be blurred. On the one hand, while SHGs have originated as locus for solidarity between women and platforms for collective action, groups appear increasingly centered on financial activities. On the other hand, MFIs often use these already constituted groups as collateral in their group lending schemes.

30% of female debtors have outstanding microcredits, contracted through SHG or otherwise. Working more often for pay than non-microcredit users, they are in large majority casual workers (79%), more frequently self-employed in the non agricultural sector (12% against 8%), and tend to belong to poorer households, with a 20% lower per capita household income on average (see Table 3 in Appendix). Using microcredit in combination with informal sources appears common: about four fifths of the women with unsettled microcredits at the time of the survey have also outstanding debts contracted from informal credit sources.

## 2.2 Debt burden

Households are, on average, indebted to the tune of twice their annual income at the time of the survey. The poorer the household, the deeper the indebtedness: in the first quartile of household per capita income, the average household debt-to-annual income ratio amounts to 3.7, as opposed to 0.9 in the last (Table 1). Within households, the magnitude of women’s involvement in the financial sphere contrasts with their contribution to income. On average, 37% of household debts and 22% of household income have been respectively contracted and earned by women. Descriptive statistics moreover suggest

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<sup>17</sup>Former NGOs transformed into private companies, ancient urban companies considering rural women as a new market niche, or private and international banks providing microcredit programmes. With 35 microfinance providers (a dozen in the studied area) and 3.2 million clients in 2016-17 (Bharat Microfinance Report 2017), Tamil Nadu is one of the leading states in India.

that Dalit and poorer households may rely more on women’s borrowing. In the first quartile of per capita income, the male head is the sole debtor in 14% of the households as opposed to 27% in the last quartile, and in 17% of the Dalit households as opposed to 22% of the upper-caste households. Likewise, women’s average debt share is 60% larger in the first quartile than in the last, and one and a half times larger in Dalit households than in upper-caste households (Table 1).

Overall, debt levels reflect the gender discrepancy in income. While men and women are debtors in similar proportions, male debtors have on average 2.2 higher debt outstanding than their female counterparts (Table 2). But they borrow actually far less in relative terms. Female debtors with positive earnings get into debt to the tune of 9 times their annual income on average, against 3 times for males (3 and 1 at the median respectively). Women with outstanding microcredits tend to be more indebted, with a debt-to-annual income ratio averaging 12.6 (4.2 at the median), as opposed to 7.7 for the other female debtors (2.4). Microcredit debt represents on average nearly half of the users’ outstanding (44%), and triple (2.8) their annual income (Table 3 in Appendix).

## 2.3 Debt purpose and uses

Differences in loan sizes also stem from differences in borrowing motives. Our data provide two measures of loan use<sup>18</sup>: planned use and actual use, both as dummy variables. Loan planned use (hereafter loan purpose) records how the money was intended to be spent at the time of borrowing, in one of the spending items listed in Table 4. Loan “actual” use (hereafter loan use) details how the money was spent in practice, with possibly several expenditure items. Both measures have their advantages and limitations. The actual use of the loans is of primary interest, but the data do not allow to weight the different uses: having spent some credit money on a spending item is recorded as a dummy variable equal to 1 regardless of the portion of the loan spent, as long as strictly positive, and gender differences thus tends to be spread out. But loan initial purpose is unavailable for

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<sup>18</sup>For all loans but wage advances. The weight of wage advances is still marginal: 3% of male loans in frequency, 0.3% of females.

gold pledges<sup>19</sup>. As such, we present the results for both variables, which display similar patterns (Table 4).

Prominent borrowing purposes include daily consumption smoothing and marriage financing, alongside housing expenditures and productive investment in farm or non farm business. First, productive investment makes up a rather small proportion of debts. Secondly, it is largely a male practice. 10% of female debtors took out at least one of their outstanding loans for business purposes, as opposed to 27% of males, and 17% of female debtors have in turn actually spent at least some of their credit money for this use, as opposed to 27% for men. By contrast, ensuring family subsistence weighs particularly heavily on women's debt. Half (53%) of female debtors took out at least one of their outstanding loans to meet daily consumption expenses (such as food), as opposed to one third (35%) of males. On average, 42% of their total debt was taken out for this purpose, twice as much as for men (20%).

As mentioned in the previous section, women are far deeper indebted than men relatively to their incomes. To this regard, it turns out in our sample that women more often put their loans towards repaying other loans. Borrowing to repay debts (purpose) is rare in our sample - and potentially underestimated -, as it concerns only 2% of the loans. 8% of female borrowers took out at least one of their outstanding loans to repay a debt, while 4% of males have. The gender discrepancy is however much clearer when the actual use of the loans is considered. 22% of female debtors have used at least some of their loans to repay other loans, as opposed to 9% of males. This may reflect the fact that they struggle more to repay, and/or their responsibilities as budget managers and therefore as managers of household debts.

Last, women who resorted to microcredit did not use their credits significantly more frequently to finance investments (Table 3 in Appendix). They actually used them significantly more often to handle daily expenses (72% as opposed to 50% of non-users) and to repay other loans (29% as opposed to 19%)<sup>20</sup>.

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<sup>19</sup>Gold pledges represent 1.3% of male loans and 39% of females in frequency; 13% of female borrowers resorted exclusively to pawnbroking. In a survey of four villages of the same area, Guérin et al. (012a) observed that pawnbrokers are a more frequent loan source for household and health expenditures.

<sup>20</sup>This result may still be driven by the fact that they contracted more loans and larger amounts, which

Table 4: Borrowing purposes and loan uses: debtor-unit descriptive statistics

Table 4A: Initial purposes of outstanding loans: means by sex

	Having contracted at least one of the outstanding loans for:				Share of outstanding debts initially contracted for:			
	Men	Women	Diff		Men	Women	Diff	
<i>Business expenditures:</i>	0.275	0.102	0.173***	(5.51)	0.195	0.076	0.119***	[5.29]
Agriculture	0.165	0.072	0.093***	(3.59)	0.108	0.054	0.0540**	[2.97]
Non farm business	0.121	0.034	0.086***	(3.95)	0.087	0.022	0.065***	[4.47]
<i>Household expenditures:</i>	0.884	0.951	-0.067**	(-3.03)	0.792	0.924	-0.131***	[-5.79]
Daily expenses	0.347	0.532	-0.185***	(-4.90)	0.202	0.419	-0.217***	[-6.72]
Debt repayment	0.042	0.083	-0.041*	(-2.29)	0.023	0.039	-0.016	[-1.4]
Health expenses	0.146	0.091	0.055*	(2.17)	0.079	0.061	0.017	[1.01]
Marriage, death	0.282	0.121	0.160***	(5.02)	0.207	0.093	0.114***	[4.84]
Housing	0.195	0.211	0.017	(-0.55)	0.126	0.154	-0.028	[-1.16]
Ceremonies	0.131	0.087	0.044*	(1.81)	0.058	0.058	0.00	[0.05]
Education	0.159	0.143	0.00	(0.28)	0.097	0.099	-0.002	[-0.12]
Number of observations	473	265			473	265		

Table 4B: Actual use of outstanding loans: means by sex

	Having actually spent at least some credit money for:			
	Men	Women	Diff	
<i>Business expenditures:</i>	0.279	0.171	0.108***	(3.89)
Agriculture	0.173	0.118	0.055*	(2.35)
Non farm business	0.117	0.060	0.057**	(2.99)
<i>Household expenditures:</i>	0.898	0.928	-0.030	(-1.63)
Daily expenses	0.440	0.566	-0.126***	(-3.81)
Health expenses	0.194	0.178	0.016	(0.62)
Marriage, death	0.335	0.206	0.130***	(4.39)
Debt repayment	0.092	0.222	-0.130***	(-5.44)
Housing	0.212	0.245	-0.032	(-1.16)
Ceremonies	0.198	0.192	0.006	(0.24)
Education	0.185	0.196	-0.011	(-0.42)
Number of observations	480	433		

[t-stat], (z-stat), \* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001

Source: NEEMSIS survey (2016-17). Authors' compilation.

can mechanically increase their probability to have a positive outcome in our non exclusive categories of actual use.

## 2.4 Intra-household cooperation over debt repayment

The fact that women are considerably more deeply indebted than men, and mostly to help make ends meet, obviously raises questions about how men assist financially, and more generally about intra-household cooperation. Further research is needed on this critical issue. While our data is limited, it suggests that fully pooling and sharing the household debt burden is not the norm. Whether borrowers had assistance with repayments is only recorded in our data for a subsample of the loans: 52% of the total in frequency. Those were the loans that respondents highlighted as the most critical to repay, with a maximum of three per household. This subsample of “main loans” is therefore not representative; yet since their settlement is seen as critical, it seems quite probable that the potential bias would be towards overstating intra-household cooperation. As it turned out, borrowers declared not to receive any help for the vast majority of the main loans (Table 5). While female main loans clearly more often benefit from help than male ones, female debtors still have to contend with two thirds (64%) of their main loans on their own.

Table 5: Receiving help for debt repayment: “main loans”-unit descriptive statistics, means by debtors’ sex

	ALL MAIN LOANS				MARRIED DEBTORS’ MAIN LOANS			
	Male	Female	Diff		Male	Female	Diff	
To settle the loan, the debtor receives:								
No help	0.715	0.635	0.079*	(2.46)	0.704	0.569	0.134***	(3.47)
Help from spouse	0.213	0.237	-0.024	(-0.82)	0.223	0.348	-0.125***	(-3.48)
Help from a child living at home	0.090	0.109	-0.020	(-0.97)	0.091	0.083	0.008	(0.33)
Help from a child not living at home	0.039	0.044	0.005	(-0.34)	0.042	0.044	-0.002	(-0.13)
Other help	0.011	0.022	-0.010	(-1.28)	0.011	0.022	-0.011	(-1.12)
Number of observations	792	274			739	181		
Share in total outstanding loans (in freq.)	0.656	0.329			0.662	0.272		

(z-stat), \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: NEEMSIS survey (2016-17). Authors’ compilation.

Overall, these descriptive statistics suggest that while women and men seem to have a similar propensity to borrow, women get into debt far more heavily in relation to their incomes. Furthermore, they predominantly and more frequently than men borrow for non productive purposes, to smooth consumption and to ensure household reproduction. They also more often put their loans towards repaying other loans. Microcredit users, who are

more deeply indebted than the other borrowers, follow this pattern. Last, women seem to have greater financial responsibilities in poorer and Dalit households, two categories that substantially overlap. To further investigate the roles of poverty and caste and how they interplay with gender, we will now turn to an econometric analysis of debt at the intensive and extensive margins. First we will seek to understand who gets into debt; second, how social lines of differentiation affect the intra-household distribution of borrowing responsibility, i.e. women’s and men’s individual of household debts.

### 3 Gendered borrowing responsibilities: do caste and poverty matter? Econometric framework

#### 3.1 Being indebted

In a first step (Table 8, Appendix 1), we investigate the determinants of indebtedness on a pooled sample of adult men and women. Pooling samples allows to maximize statistical power and to compare groups “all else being equal”, although splitting samples improves model specification (the effects of all explanatory variables being likely to differ between groups). We test whether the effects of some variables differ by sex by including interaction terms. We model the conditional probability of being indebted at the time of the survey with a logistic function, the parameters being estimated by maximum likelihood<sup>21</sup>:

$$P(y_i = 1|x_i) = \frac{\exp(\beta x_i)}{1 + \exp(\beta x_i)} \quad (1)$$

with  $y_i$  a dummy variable equal to 1 the individual  $i$  has some unsettled debt taken out in her own name,  $x_i$  a vector of observed characteristics. We compare several nested Logit models to explore the effect of mediating variables.

Alongside sex and caste, Model (1) encompasses individual-, household- and village-level variables. Individual-level variables include marital status (a dummy for having never been married), age and its squared value, categories of educational attainment

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<sup>21</sup>Using a Probit model does not alter the nature of the results. Results available from the authors.

(no school, primary education, secondary or more), and the number of children younger than 16<sup>22</sup>. Whether the individual was banked or not was not included, since the effect would have been uninterpretable. Having a bank account may reflect that the individual received a state benefit, or worked for pay through the NREGS. Household-level variables include its (logged) size, female headship (as reported by respondents), and occurrence of shocks, i.e. whether the household was interviewed after demonetisation, and whether a household member got married in the last three years. Last, village dummies are included to control for village-level unobserved determinants of financial practices. Some villages are for instance more isolated than others, in terms of distance to town or to main transport artery, which chiefly affects access to bank loans and individual loans from finance companies: the remaining types of lenders usually are either present locally or go to the village themselves (providers of group loans typically visit potential customers at home).

In order to explore the effect of poverty, Model (2) further includes the (logged) annual per capita household income, a dummy for household land ownership, and the (logged) value of household non land assets. The level of per capita household income is expected to reflect the ability of households to smooth consumption on a routine basis. Immovables are expected to influence creditworthiness, and movables or savings to act as buffers enabling to deal with major shocks without resorting to debt. These variables are included only in a second stage since economic inequality can be regarded as a critical dimension of caste inequality.

Whether previously estimated gaps stem from differences in occupational breakdown is tested by Model (3) which includes a dummy for being employed, and Model (4), where categories of main occupation are added. Defined as the highest income generating activity during the year, main occupation is recorded in four categories: agricultural or non agricultural self-employment, casual employment, regular employment, and no paid employment. The purpose of this specification remains descriptive: it does not allow to

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<sup>22</sup>In a neighbouring area, Agier et al. (2012) found that the debt amount of mothers (sampled among SHG members) was positively correlated to their number of daughters while those of fathers was correlated to their number of sons. We tested for it but found no significant effect of the gender of children.

disentangle between several channels. Different occupations come with different credit needs but also different creditworthiness. Earning any income is likely to be positively correlated with the propensity to borrow since it implies some repayment capacity. But the rigidity of normative restrictions to women’s mobility and social interactions (less stringent for the poorer and especially for Dalit), that affect their engagement in paid employment, is also likely to impact their ability to borrow by making contact with lenders more or less easy or socially tolerable. Last, debts can also put women to work to repay.

To test for intersectionality effects, we add a two-way interaction between sex and caste for each model (Models (1C), (2C), (3C), (4C)), and between sex and household per capita income (Models (2I), (3I), (4I))<sup>23</sup>. Following Abadie et al. (2017), we do not cluster standard errors at the household level, since external validity is not our ambition owing to the survey design.

## 3.2 Debt share

In a second step, we investigate the determinants of the size of household debt share held by individuals. The adults living in households without any outstanding debts are therefore excluded from the analysis, representing however an insignificant proportion of the population (10 individuals out of 1610). As our dependent variable is a proportion, we use a Generalized Linear Model with a binomial distribution and a logit link function, or “fractional logit” model, proposed by Papke and Wooldridge (1996). The bounded nature of the dependent variable makes indeed a linear regression inappropriate (Cox (1996); Papke and Wooldridge (2008)), and a Tobit model would be unsuitable as the data are not censored, but defined on the interval  $[0,1]$  (Maddala (1991); Cook et al. (2008)). Moreover, due to the mass point at 0 of the dependent variable, a logit transformation of the latter would result in a substantial loss of information, while the fractional logit model allows to handle both zeros and ones<sup>24</sup>. The conditional expectation of debt share

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<sup>23</sup>Interaction effects between sex and household non land assets were found not significant.

<sup>24</sup>Nonetheless, it does not allow the limit values to be generated by a distinctive process, and thus does not account for potential selection effects (Baum (2008); Cook et al. (2008)).



is therefore modeled with a logistic function:

$$E(y_i|x_i) = G(\beta x_i) = \frac{\exp(\beta x_i)}{1 + \exp(\beta x_i)} \quad (2)$$

with  $0 \leq y_i \leq 1$  the share of household debt held by the individual  $i$ ,  $x_i$  a vector of observed characteristics.

Parameters are estimated through a quasi maximum likelihood method maximizing the following Bernoulli log-likelihood function (Gourieroux et al. (1984), McCullagh and Nelder (1989)):

$$l_i(\beta) = y_i \log[G(x_i\beta)] + (1 - y_i) \log[1 - G(x_i\beta)] \quad (3)$$

As a robustness check, we also tested another estimation strategy, using a zero-and one-inflated beta model estimated by maximum likelihood (Smithson and Verkuilen (2006); Cook et al. (2008); Ferrari and Cribari-Neto (2004); Ospina and Ferrari (2012)). The beta distribution is highly flexible and adaptable to a large variety of shapes, but does not cover values of zero and one. The zero- and one-inflated beta model consists thereby of a mixture of three models: the probability that the proportion equals zero is modeled with a logistic regression, those that the proportion equals one with another logistic regression, and proportions between zero and one are dealt with a beta model. In particular, it allows to account for the possibility that holding zero debt, the totality of household debts or a mere share are underpinned by qualitatively different processes (for example if certain individuals are “never takers” of debt whatever the circumstances). The replication results are presented in Appendix (section III) and corroborate on the whole those of the fractional logit.

Models are specified according to the same procedure as in the first step. Starting out with four nested models, (1) to (4), that have the same explanatory variables as previously, we then include a two-way interaction between sex and caste (models (1C) to (4C)). Likewise, in Models (2I) to (4I), we add a two-way interaction between sex and household per capita income to the specifications (2) to (4). However, as we find more

robust and stronger intersectionality effects than in the first step, we further explore their interplay, that is whether the interaction effects between sex and caste were essentially reflections of the interactions effects between sex and poverty (or the other way around). A three-way interaction between sex, caste and household per capita income was tested, but found not significant (Tables 10 and 10bis in Appendix). We therefore present the results of specifications including two two-way interactions, between sex and caste, and between sex and household per capita income (Models (2CI) to (4CI)).

So far, the relationship between the intra-household distribution of borrowing responsibilities and the extent of relative contributions to household income has been left aside. In order to provide some broad descriptive insights,, econometric results for a specification including (in addition to main occupation variables) a three-way interaction between sex, income share and household per capita income, are presented and discussed in Appendix (Table 12, Figures 4 to 6). The ability to earn income is indeed undoubtedly pivotal, to understand the magnitude of financial involvement (a higher income plausibly implying higher creditworthiness), but also the associated financial pressure (through the disjunction between repayment capacity and debt). Comparing men and women at same levels of income shares makes little sense due to a substantial gender income gap; however, it would be of interest to know whether the fact that poorer women borrow more is a mere reflection of the fact that they tend to earn more, namely whether it is driven by a “creditworthiness effect” as opposed to gendered responsibilities implying to borrow when money is short. This hypothesis, still, cannot be tested with data at hand, due to omitted variables and reverse causality issues. In particular, the survey design does not allow to disentangle between this creditworthiness effect and the fact that in poor households, earning income and borrowing may be simply to sides of the same coin, namely bringing cash inflows. Likewise, it does not allow to deal with the fact that certain women may engage into paid employment or increase their labour supply precisely because they have strong borrowing responsibilities, in order to meet debt repayment which is more likely to be the case in poorest households, in which financial strain may limit the possibilities of support from other household members.

Table 6 sums up the different specifications. Summary statistics for the selected independent and dependent variables by sex can be found in Table 7 in Appendix.

Table 6: Summary of specifications

Specifications		Being indebted (LOGIT) All adults	Debt share (FRACTIONAL LOGIT) All adults in indebted households
(1)	basis controls	✓	✓
(2)	+ log (household p.c. income) + land dummy +log (assets)	✓	✓
(3)	+ dummy for not working for pay	✓	✓
(4)	+ main occupation dummies	✓	✓
(1C - 4C)	(1)-(4) + two-way interaction: sex*caste	✓	✓
(2I - 4I)	(2)-(4) + two-way interaction: sex*household p.c. income	✓	✓
(1CI - 4CI)	(1)-(4) + 2 two-way interactions: sex*caste, sex*household p.c. income		✓
Number of observations		1610	1600

### 3.3 Interpretation

Our method of interpretation is based on predictions (Long and Freese (2014); Long and Mustillo (2018)): we compare groups in the metric of outcome probability in the first step and of its predicted value in the second, presenting the results in terms of marginal effects of regressors or of predictions for ideal-types. This metric is well suited to our descriptive approach since it is easy to interpret and intuitive<sup>25</sup>; it also allows to avoid issues of identification or rescaling stemming from differences in residual variability when comparing regression coefficients of nested nonlinear models (Winship and Mare (1984); Allison (1999); Wooldridge (2002); Mood (2010)). Last, it enables the estimation of interaction effects, whose existence and magnitude cannot be inferred in nonlinear models from the size and significance of an interaction term (Ai and Norton, 2003).

The marginal effect, or partial effect, of a variable  $x$  is the estimate of the change in the outcome for a change in  $x$  holding all other (unlinked) independent variables constant. For instance, when measuring the effect of per capita household income, we compute the change in the predicted outcome triggered by a change from the cutoff point between the third and fourth quartile of household per capita income (hereafter Q75) to the cutoff point between the first and second quartile (hereafter Q25). Since the marginal effect

<sup>25</sup>Besides, in the case of our Logit models for being indebted, the observed debtor status is our genuine outcome of interest, not a potential underlying “propensity to borrow” (which is the scale on which regression coefficients express the relationships). See Kuha and Mills (2020).

of a variable depends on the specific values of all variables in the model, we use the average marginal effects (hereafter AME) as a summary measure<sup>26</sup>: the marginal effect is thereby computed for each observation and then averaged. It is therefore sensitive to the particular distribution of regressors in the population, which is not an issue since we do not seek external validity.

To test for interaction effects, we compute AME on subsamples (setting the value of the sex variable at 0 or 1, or the caste variable at 0 or 1) and test second differences (Long and Freese, 2014). For instance, in order to test for interaction effects between sex and caste, we would test whether the AME of caste (being Dalit as opposed to non Dalit) for men and the AME of caste for women (i.e. the first differences) are equals (second difference) or likewise, whether the AME of sex (being a woman as opposed to a man) for Dalits and for non Dalits - are equals. This is done with a Wald test, using variance and covariance estimates calculated by the delta method.

## 4 Results

### 4.1 Being indebted

Class, through per capita household income and household assets, is overall not significantly correlated with the propensity to be in debt, all else being equal (Table A in Appendix), which is consistent with the generalization of indebtedness at the household level. The greater the size of the household (and thus the potential number of income earners, or of debt takers), the lower the predicted probability to be in debt, while the reverse holds for the number of (own) children. In the same vein, unmarried individuals are predicted to have on average a lower probability to be in debt than married individuals. From the side of occupational breakdown, self-employed individuals (in agriculture or non agricultural business) have the highest predicted probability to borrow, plausibly

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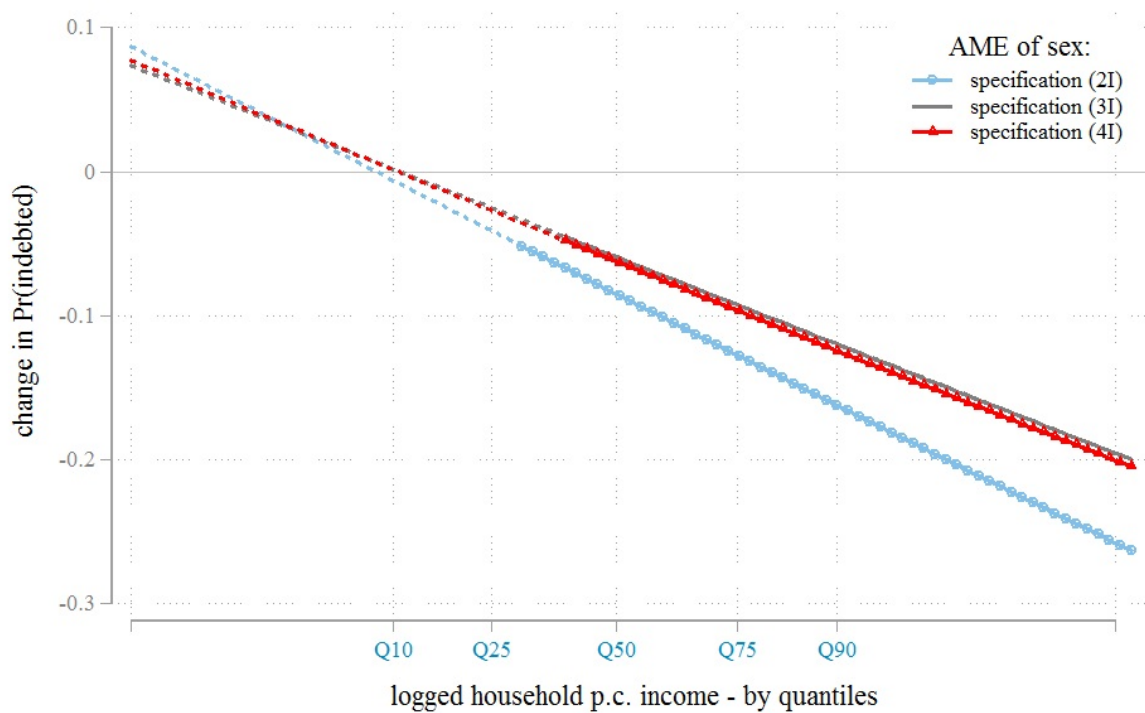
<sup>26</sup>Other choices include the computation of the marginal effect with all other variables held at “representative values” of interest (MER), usually their mean in this case (MEM). The “average person” for whom the MEM is computed is yet unlikely to be represented in the sample, especially in the presence of binary independent variables. Depending on the cases, the mean may be or not be a location of substantive interest to study the effect. See Long and Freese (2014), chap. 6.

reflecting their investment needs and higher creditworthiness. Unemployed or inactive individuals have the lowest predicted probability to take on debt alongside those benefiting from regular employment. Casually employed individuals are on average more likely to be indebted, all else being equal, than those in regular employment, as can be expected from their lower and more volatile incomes. Being a woman is consistently associated to a significantly lower probability to be indebted across all specifications, although the AME of sex decreases when controlling for occupational breakdown, especially mere engagement in paid employment (Table A in Appendix and Table 8, columns (3C) and (4C), (3I) and (4I)). However, while caste and household per capita income are overall not significant, the results suggest slight intersectionality effects.

First, the gender gap in predicted probability to be in debt differs on the basis of caste. Interaction effects between sex and caste, i.e. significant differences in the AME of caste by sex or in the AME of sex by caste, are found significant when controlling for our basic set of control variables and household prosperity (Table 8A, columns (1C) and (2C), second differences). It is no longer the case when the differentiated employment of Dalits and non Dalits is accounted for (columns (3C) and (4C), second differences). Across specifications, women are expected to have a 10 to 14% lower predicted probability to be indebted than men on average (AME of sex); but this difference is larger among non Dalits (between 15 and 20%), and not significant among Dalits. Yet, even when interaction effects are significant, they are not strong enough to lead to a significant difference in predicted probabilities to be indebted between Dalit and non Dalit women (AME of caste for women).

Secondly, the gender gap depends on poverty level. Interaction effects between sex and household per capita income are significant across all specifications (Table 8B, second differences). Figure 1 shows that the gender gap in average predicted probability to be in debt is negatively correlated to household per capita income, and turns statistically significant only between the Q25 and the median. As an illustration, at the Q25, men and women have a similar average predicted probability to be in debt; by contrast, at the Q75, women have a 15 to 20% lower average predicted probability to be in debt than men

across the specifications (Table 8, columns (2I) to (4I), AME of sex at the Q25 and Q75). Inequalities within each sex are less marked. With basic and assets controls, men living at the Q25 are expected to be 7% less likely on average to be in debt than otherwise similar men living at the Q75 (AME of household p.c. income for men, column (2I)). The discrepancy is no longer significant when taking into account employment-related characteristics (columns (3I) and (4I)). No significant difference is found within women.



*NOTE: AME of sex is significantly different from 0 at the 0.05 level when lines are solid*

Figure 1: Average marginal effect of sex (being a woman vs a man) on the predicted probability to be indebted at the time of the survey, across the range of logged per capita household income. Logistic regressions analysis, specifications (2I) to (4I). N=1610

Table 8: Caste and poverty as moderators of gender differences in probability to be indebted. Logistic regressions analysis, results in ppoints. N=1610

Table 8A: Results for an interaction between sex and caste

	CHANGE IN PROBABILITY			
	(1C)	(2C)	(3C)	(4C)
<i>Main effects:</i>				
AME sex (being a woman vs a man)	-0.084*** (0.022)	-0.084*** (0.022)	-0.058* (0.023)	-0.060* (0.024)
AME caste (being a Dalit vs a non Dalit)	0.008 (0.022)	0.005 (0.024)	0.002 (0.024)	0.006 (0.024)
<i>Two-way interaction between sex and caste:</i>				
AME sex for non Dalits	-0.126*** (0.030)	-0.126*** (0.030)	-0.091** (0.031)	-0.090** (0.031)
AME sex for Dalits	-0.039 (0.030)	-0.039 (0.030)	-0.022 (0.030)	-0.029 (0.031)
AME caste for men	-0.035 (0.029)	-0.038 (0.030)	-0.032 (0.030)	-0.025 (0.030)
AME caste for women	0.054 (0.032)	0.051 (0.033)	0.038 (0.033)	0.039 (0.032)
Second difference test	-0.089* (0.041)	-0.089* (0.041)	-0.070 (0.041)	-0.064 (0.040)

Table 8B: Results for an interaction between sex and household p.c. income

	CHANGE IN PROBABILITY		
	(2I)	(3I)	(4I)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.085*** (0.022)	-0.060** (0.023)	-0.063** (0.024)
AME household p.c. income (being at the Q25 vs the Q75)	0.000 (0.017)	0.003 (0.017)	-0.006 (0.017)
<i>Two-way interaction between sex and household p.c. income:</i>			
AME sex at the Q75	-0.128*** (0.026)	-0.092** (0.027)	-0.097** (0.028)
AME sex at the Q25	-0.041 (0.026)	-0.025 (0.026)	-0.027 (0.027)
AME household p.c. income for men	-0.042* (0.021)	-0.030 (0.021)	-0.040 (0.021)
AME household p.c. income for women	0.046 (0.024)	0.038 (0.024)	0.030 (0.024)
Second difference test	-0.088** (0.029)	-0.068* (0.029)	-0.070* (0.029)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* (1): basis controls. (2): (1) + logged household p.c.income + logged household non land assets + land ownership dummy. (3): (2) + paid employment dummy. (4): (2)+ main occupation categories.

(1C)-(4C): (1)-(4) + two-way interaction between sex and caste. (2I)-(4I): (2)-(4) + two-way interaction between sex and logged household p.c. income.

## 4.2 Debt share

This section turns to the analysis of the share of household debts contracted by male and female adults, excluding thereby individuals living in households with no debts at the time of the survey (10 adults out of 1610). Discrepancies on the basis of caste and poverty level appear markedly stronger when the intra-household allocation of the burden of debt is examined, rather than focusing on the sole debtor status (the full set of average marginal effects can be found in Appendix, Tables C, D, E).

As before, the gender gap in predicted debt shares depends on social categories: in terms of both caste and per capita household income, interaction effects with sex are significant across all specifications (Tables 9A and 9B, second differences; the same pattern holds with zero- and one- inflated beta models, see Table 9Abis and 9Bbis in Appendix). They are also strong enough to lead to significant inequalities within groups.

Inequalities between men and women are negatively correlated to the level of per capita household income (Figure 2). At the Q25, across specifications, women are predicted to have on average between 30 to 35% lower shares of debt than otherwise similar men (Table 9B, AME of sex at the Q25), while the discrepancy rises to 50-55% at the Q75. Likewise, the gender gap is lower among Dalits. Dalit women are expected to hold on average 31 to 34% lower shares of debt than Dalit men (Table 9A, AME of sex for Dalits), while the gender gap ranges from 48 to 54% among non Dalits.

The poorest women of the sample are predicted to have significantly higher shares of debt than richest women on average, across all specifications. Women living at the Q25 are expected to have 25 to 31% higher shares of household debts than those at the Q75 (Table 9B, AME household p.c. income for women). Conversely, men living at the Q25 are predicted to have on average 9 to 11% lower shares of household debts than their counterparts at the Q75. As for Dalit women, they are expected to have on average 29 to 39% higher debt shares than non Dalit women (Table 9A, AME caste for women), while no significant difference is found among men.



Table 9: Caste and poverty as moderators of gender differences in the magnitude of borrowing responsibilities. Analysis of fractional Logit regressions of the share of household debts contracted, results in ppoints. N=1600

Table 9A: Results for an interaction between sex and caste

	CHANGE IN DEBT SHARE			
	(1C)	(2C)	(3C)	(4C)
<i>Main effects:</i>				
AME sex (being a woman vs a man)	-0.176*** (0.016)	-0.174*** (0.016)	-0.158*** (0.016)	-0.150*** (0.017)
AME caste (being a Dalit vs a non Dalit)	0.023 (0.016)	0.014 (0.017)	0.012 (0.017)	0.019 (0.017)
<i>Two-way interaction between sex and caste:</i>				
AME sex for non Dalits	-0.225*** (0.021)	-0.224*** (0.021)	-0.201*** (0.021)	-0.188*** (0.022)
AME sex for Dalits	-0.124*** (0.022)	-0.123*** (0.022)	-0.114*** (0.022)	-0.110*** (0.023)
AME caste for men	-0.023 (0.022)	-0.032 (0.023)	-0.028 (0.023)	-0.017 (0.023)
AME caste for women	0.071** (0.021)	0.064** (0.022)	0.055* (0.022)	0.057** (0.022)
Second difference	-0.094** (0.030)	-0.095** (0.030)	-0.082** (0.029)	-0.074* (0.029)

Table 9B: Results for an interaction between sex and household p.c. income

	CHANGE IN DEBT SHARE		
	(2I)	(3I)	(4I)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.175*** (0.016)	-0.161*** (0.016)	-0.152*** (0.017)
AME household p.c. income (being at the Q25 vs the Q75)	0.007 (0.012)	0.008 (0.012)	0.005 (0.012)
<i>Two-way interaction between sex and household p.c. income:</i>			
AME sex at the Q75	-0.228*** (0.019)	-0.206*** (0.019)	-0.198*** (0.021)
AME sex at the Q25	-0.127*** (0.019)	-0.119*** (0.018)	-0.111*** (0.019)
AME household p.c. income for men	-0.042* (0.017)	-0.034* (0.017)	-0.037* (0.017)
AME household p.c. income for women	0.060*** (0.014)	0.053*** (0.014)	0.050*** (0.014)
Second difference	-0.101*** (0.020)	-0.087*** (0.020)	-0.087*** (0.020)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* (1): basis controls. (2): (1) + logged household p.c.income + logged household non land assets + land ownership dummy. (3): (2) + paid employment dummy. (4): (2)+ main occupation variables. (1C)-(4C): (1)-(4) + two way interaction between sex and caste. (2I)-(4I): (2)-(4) + two-way interaction between sex and logged household p.c. income.

These interaction effects between sex and caste may yet be driven by the interaction effects between sex and per capita household income (or the other way around), since Dalits tend to be poorer. Furthermore, the effect of being Dalit for women may vary depending on the level of household poverty. We therefore tested for the existence of a three-way interaction between sex, caste and household per capita income (Table 10 and 10bis in Appendix). With these specifications, the AME of being Dalit as opposed to non Dalit for women was found significantly different according to the level of household per capita income (decreasing with household per capita income and turning not significant near the median, Figure 4 in Appendix). As for men, the AME of caste was not significant across the whole range of household per capita income. However, this discrepancy itself between men and women, in the AME of caste across the range of per capita income, was not found statistically significant (Table 10, third difference).

A three-way interaction between sex, caste and household per capita income having thereby proved not significant, we present the results provided by models including two two-way interactions, between sex and caste, and sex and household per capita income (see Table E in Appendix for the full set of average marginal effects). The two-way interaction between sex and household per capita income remains significant across all specifications; the same result is obtained with zero and one inflated beta regressions (Tables 11, 11bis). After controlling for the intersectionality effects between gender and poverty, the two-way interaction between sex and caste persists (Table 11, column (2CI), which implies that it was not solely driven by the overrepresentation of Dalits among the poorest. It remains significant when accounting for the differentiated engagement into paid employment between Dalits and non Dalits. With a fractional logit model, the interaction turns however no significant when controlling for differences in occupational breakdown, while it persists with a zero and one inflated beta model (Tables 11, 11bis, columns (4CI)).

Table 11: Accumulation of inequalities in the magnitude of borrowing responsibilities. Analysis of fractional Logit regressions of the share of household debts contracted. Results for two two-way interactions: sex and caste, and sex and logged per capita household income (in ppoints). N=1600

	CHANGE IN DEBT SHARE		
	(2CI)	(3CI)	(4CI)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.175*** (0.016)	-0.161*** (0.016)	-0.153*** (0.017)
AME caste (being Dalit vs non Dalit)	0.014 (0.017)	0.012 (0.017)	0.019 (0.017)
AME household p.c. income (being at the Q25 vs Q75)	0.007 (0.012)	0.008 (0.012)	0.005 (0.012)
<i>Two-way interaction between sex and caste:</i>			
AME caste for men	-0.019 (0.023)	-0.017 (0.023)	-0.007 (0.023)
AME caste for women	0.049* (0.021)	0.044* (0.021)	0.047* (0.021)
Second difference	-0.068* (0.030)	-0.061* (0.029)	-0.053 (0.029)
<i>Two-way interaction between sex and household p.c. income:</i>			
AME household p.c. income for men	-0.037* (0.017)	-0.030 (0.017)	-0.034* (0.017)
AME household p.c. income for women	0.054*** (0.014)	0.049** (0.014)	0.046** (0.014)
Second difference	-0.091*** (0.020)	-0.078*** (0.020)	-0.080*** (0.020)
<i>Illustration: differences between ideal-types:</i>			
being a Dalit woman at the Q25 vs a non Dalit woman at the Q75	0.103*** (0.025)	0.093*** (0.025)	0.092*** (0.025)
being a Dalit man at the Q25 vs a non Dalit man at the Q75	-0.056* (0.027)	-0.047 (0.027)	-0.040 (0.027)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* (2): basis controls + logged household p.c.income + logged household non land assets + land ownership dummy. (3): (2) + paid employment dummy. (4): (2)+ main occupation categories. (2CI)-(4CI): (2)-(4) + two-way interaction between sex caste + two-way interaction between sex and logged household p.c. income.

That the intersection effects between sex and caste are found robust to some respects to a control for the intersectionality effects between gender and poverty suggests that Dalit women may bear an accumulation of inequalities. This is clear when Dalit and non Dalit women are compared at “representative values” through ideal-types (Table 11). For example, a Dalit woman at the Q25 is expected to bear on average a household debt share 22-23% higher than those of an otherwise similar non Dalit woman at the Q25, but 51-59% higher than those of a non Dalit woman living at the Q75.

## Discussion and Conclusion

As argued in the introduction, the quantification of the gender of debt remains a blind spot of current debates about financial inclusion and financialization. This paper has taken the case of rural south India and drawn on a detailed household survey with disaggregated data by sex about all types of debts - something which is still unusual and explains partly the aforementioned gap -, to seek to quantify debt and identify some of its determinants. In a context characterized by a highly dynamic financial landscape and the rapid expansion of new credit market tools, we asked whether men and women borrow differently, at different levels, from distinct sources, under specific conditions and for varying purposes.

Debt is gendered, on various grounds. Men earn much more, but borrow much less in relative terms. Female debt is first and foremost driven by the characteristics of their household, caste and poverty level. Women in the poorest households, despite meager incomes, have the highest borrowing responsibilities, shouldering the highest shares of household debt. They as such tend to get into debt when other cash-strapped household members can only offer limited support, while their debt-to-income ratios indicate great financial vulnerability. For their part, Dalit women tend to face higher debt burdens than their female counterparts, and this even after controlling for caste discrepancies in per capita income. Their larger role in household debt management may be linked to their greater mobility and lower restrictions on social interactions, notably with men, which would underpin both their greater income shares and their access to credit relations. Alongside such caste-based variations in valuations and injunctions, Dalit’s greater debt

burden could also be explained by differences in the structure of social honor (Velaskar, 2016) between castes, underpinning the greater social acceptability for Dalit women of working for pay but perhaps also of contracting degrading debts.

Indeed, the use of debt is also gendered: female debt is predominantly and much more often than male used to make ends meet (explaining why per capita income, more than assets, is found to be determinant), while economic investment remains in great part a male practice. These differences in borrowing motives can plausibly trigger gendered economic consequences, typically in terms of financial hardship (as suggested by women's higher propensity to use their loans to repay other debts), but they also have an unequal impact in terms of status. As highlighted elsewhere (Garikipati, Agier, Gurin and Szafar, 2017), while borrowing large sums, especially by banks, is honourable and a sign of social prestige, "begging" for small amounts to ensure livelihood is seen as degrading (and particularly for men).

Beyond the particularity of our case study, our results have two major theoretical implications. The first concerns the gendered earmarking of debt flows. The parallel with the earmarking of income flows is illuminating here. It had long been believed that the use of a monetary medium would neutralize social distinctions, including gender distinctions. But in the end, money does not have the dissolving power that the social sciences, economics and sociology, have long attributed to it (Simmel, 2004). Cash flows are interpreted and used in the light of pre-existing social norms and therefore do not have the same meaning, value or use depending on the social belonging of those who use them. Regarding gender, Viviana Zelizer's pioneering work has shown how the process of monetary homogenization of the late 19th century in the United States led to multiple practices of monetary differentiation, aimed at preserving social relationships, especially those of gender (Zelizer, 1994). Other contemporary analyses in a number of western countries then confirmed this earmarking process and the consequences in terms of the persistence of gender inequalities. Following a long historical process (Scott and Tilly, 1975), female wages are devalued, often qualified as "pin" wages, and more often used for social reproduction purposes (Hochschild and Machung (2012); Hood (1981); Pahl (1989)).

This earmarking of incomes makes it possible to maintain the sexual (and hierarchical) division of the roles to which men (and women) are attached. It seems that this earmarking process is equally valid for the dyad debt/credit. While women have increasing access to credit, it remains confined to specific uses and meanings. Women's debt remains a debt, i.e. a sum of money dedicated to managing daily life, and not to planning or projecting oneself into the future, which is what credit allows (Peebles, 2010).

Our results also raise a central question about the gender dimension of behaviour and agency. The fact that female debt is dependent on family poverty, which is much less the case for male debt, confirms the extent to which agency is a gendered process, which is more relational for women than for men. Further analysis would be needed to examine the consequences of this female debt on their well-being and status. In our case, are women in debt under pressure from men, who force them to assume these responsibilities? Have they internalized it as part of their obligations as mothers or wives? Do they want to take on it to gain decision-making and respect within the family space? It could prove an impossible task to try to separate out this intermingling of motivations and constraints. Feminist research has strongly criticized the "separate self" of economic theory, showing that the hypotheses of self-interest and exogenous preferences were in fact implausible (Ferber and Nelson, 2009). As argued by Amartya Sen, the *homo economicus* of neoclassical theory is a "rational fool": individual behaviour, both male and female, combines self-interest, altruism, commitment, but also obligations and coercion (Sen, 1977). However, due to patriarchal norms, the burden of obligations and coercion is often greater for women, given that it is not always easy to separate obligations and altruism since preferences have a strong capacity to adapt to constraints, and these then resemble free and assumed choices (Kabeer, 1999). In our case, and as observed elsewhere, responsibility for survival debt can undoubtedly be a source of considerable pressure for women; simultaneously however, it is precisely those survival debts which provide women with increased decision-making power (Garikipati, Agier, Gurin and Szafar, 2017), which notably contributes to explain that they are in demand for microcredit.

As mentioned in introduction, the impact of financial inclusion policies is not the focus

of this study. Microcredit represents here only one part of women’s debt. A concern raised by our intersectional results however relates to the almost exclusive targeting of women by microcredit providers in the region. Women appear to have the strongest financial responsibilities when they are poor, and when credit provision to the poor is designed to be essentially channeled through women, the reinforcement of this inequality is much likely. In addition, in our sample, female microcredit users face higher debt to income ratios and hold higher shares of household debts, while not significantly putting their loans towards investment overall.

Whether microcredit stimulates processes of reconfiguration of gender norms, exacerbating women’s responsibilities for managing scarcity, requires further analysis. This issue is crucial, in particular since the rigid repayment modalities of microcredit<sup>27</sup>, that are hardly compatible with low and irregular incomes, represent considerable challenges for the management of budgets. In our case, women regularly say that debt is now “branded on our foreheads”, and testimonies from older women indicate that this hyper-specialization of women in survival debt is recent. Microcredit is labeled, by women and men alike, as “lady loans”, and various male group lending initiatives have failed because men refuse to comply with the constraint of the group guarantee, which is experienced as a female practice and therefore emasculating. Experimental or quasi-experimental methods may be able to isolate and quantify the effects of microcredit on gendered norms related to financial responsibility. But they necessarily need to be combined with a broader analysis of the context. In particular, women’s demand for microcredit is inseparable from broader changes in gender norms within Dalit communities in Tamil Nadu over the past 30 years. For various reasons beyond the scope of this paper, there is a process of “housewifisation” (Mies, 1986), in which Dalit women have been gradually constructed as mothers and wives, increasingly dependent on male breadwinners, agents of consumption and called upon to demonstrate scientific home management in order to best manage household resources (Guérin and Kumar, 2020). It is reasonable to think that the demand for microcredit and its uses are both related to and reflect this broader process.

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<sup>27</sup>Despite persistent criticism of the damaging effects of this rigidity (Collins et al., 2009), rigid repayment modalities remain the norm, for cost reasons.

Turning to the broader issue of financialization and its gendered aspects, a quick look at history is instructive, highlighting both continuities and changes. We know from the work of Zelizer (1994) that the monetization of industrialized societies ran alongside the emergence, or strengthening, of gender monies. While money invaded daily life, men and above all women were involved in intensive work to keep a differentiation of gender financial practices and circuits. At that time, one also observed the emergence of a strong social norm assigning women a new role: that of a “good manager”. Household welfare became closely linked to housewives’ financial management capacities: “*from their virtue, universally celebrated [...] depends, it is said, the balance the family budget*” (Perrot (1991), p.101-102, our translation). Being able to manage budgets became a sign of “social competence”, and knowing how to spend became essential to “domestic expertise”, or even a “sacred duty” (Zelizer (1994), p. 41). These responsibilities, sometimes seen as privilege, at others as duty or obligation, had varied meanings and implications according to social classes. For the working classes, this heavy responsibility mostly meant the obligation to cope with uncertainty and scarcity, forcing women “*to privation in times of shortages*” (Perrot (1991), p. 101, our translation). Women’s crucial role in managing scarcity was often underestimated and made invisible, yet was a pillar of working-class daily life throughout the industrialization period. Financial management was at the core of the education they received from social workers and charities (May, 1984). The present phase of capitalism in the global South is strangely reminiscent of this period. In the case studied here, financialization permeates “the margins” (i.e. the most deprived sections of the population) through women, both because they are most often budget managers, and because financial providers target them as a priority. Given that these two aspects have been observed in many parts of the globe, we have good reasons to think that our case study is no exception. Compared with the industrialization of the global North however, there is one specificity. While at that time most efforts focused on financial education and saving, considered as a liberal virtue par excellence (Ewald (1986), p. 71; Zelizer (1994), chap. 4), debt is now another key dimension. Women already faced a permanent paradox, that has been observed across time and space: managing family budgets with



parsimony and poor income, and without having control over that income (Dwyer and Bruce (1988); Lemire et al. (2001)). Now they face a new one: managing family budgets with parsimony and poor income, and with increasing debts.

## 5 Appendix

### 5.1 Descriptive statistics

Table 3: Descriptive statistics for female debtors, with and without outstanding microcredits (respectively termed microcredit users and non users)

	MEANS FOR ALL:			
	Non users	Users	Diff	
<i>Socio-economic characteristics:</i>				
Daily household per capita income (Rs.)	99.14	76.84	22.31*	[2.90]
Household owning land	0.324	0.320	0.004	(-0.09)
Household non land assets (Rs.)	546,575	436,529	110,047	[1.90]
Education:				
No school	0.334	0.344	$\chi^2(2) = 0.05$	
Primary education	0.416	0.406		
Secondary or more	0.249	0.250		
Main occupation:				
Agricultural self-employment	0.039	0.023	$\chi^2(5) = 27.22^{***}$	
Non agricultural self-employment	0.075	0.125		
Casual labour	0.367	0.430		
NREGS	0.246	0.359		
Regular labour	0.101	0.016		
No paid employment	0.170	0.047		
No individual income	0.213	0.078	0.135***	(3.39)
Individual annual income	21,991	14,919	7071*	[2.29]
Share of household income	0.174	0.190	-0.017	[-0.65]
<i>Financial practices:</i>				
Outstanding debt (Rs.)	59,888	70,501	-10613	[-1.16]
Number of outstanding loans	1.590	2.711	-1.121***	[-8.27]
Share of household debt	0.361	0.497	-0.136***	[-3.98]
Microcredit share in total outstanding		0.439		
Debt uses: At least some of the outstanding loan(s) used for:				
Business expenditures:	0.157	0.203	-0.046	(-1.15)
Agriculture	0.115	0.125	-0.010	(-0.30)
Non farm business	0.046	0.094	-0.048	(-1.91)
Household expenditures:	0.915	0.961	-0.046	(-1.70)
Daily expenses	0.502	0.719	-0.217***	(-4.16)
Debt repayment	0.187	0.305	-0.118**	(-2.69)
Health expenses	0.164	0.211	-0.047	(-1.17)
Marriage, death expenses	0.197	0.227	-0.030	(-0.70)
Housing	0.216	0.313	-0.096*	(-2.12)
Ceremonies	0.167	0.250	-0.083*	(-2.00)
Education	0.174	0.250	-0.076	(-1.82)
Unbanked	0.187	0.015	0.171***	(4.74)
Number of observations	305	128		
	INCOME-EARNERS			
	Non users	Users	Diff	
Mean debt-to-income ratio	7.698	12.551	-4.85	[-1.39]
Median debt-to-income ratio	2.416	4.219	1.99**	[2.77]
Mean microcredit debt-to-income ratio		2.82		
Number of observations	240	118		

[t-stat], (z-stat), \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Source: NEEMIS survey (2016-17), authors' compilation.

Table 7: Sample summary statistics, means by sex

	Men	Women	Diff	
Indebted	0.576	0.557	0.019	(0.77)
Share of household debt	0.370	0.225	0.145***	[8.18]
<i>Individual-level variables:</i>				
Dalit	0.489	0.488	0.001	(0.033)
Age	41.01	39.83	1.22	[1.63]
Unmarried	0.279	0.135	0.14***	(7.24)
Number of children	0.598	0.650	-0.052	[-1.05]
Education:			$\chi^2(2) = 85.1^{***}$	
No school	0.168	0.358		
Primary school	0.344	0.326		
Secondary or more	0.487	0.317		
Main occupation:			$\chi^2(3) = 245.0^{***}$	
Self-employment	0.286	0.094		
Casual employment	0.287	0.551		
Regular employment	0.283	0.095		
No paid employment	0.144	0.260		
Share of household income	0.444	0.142	0.302***	[21.80]
<i>Household-level variables:</i>				
Household annual per capita income (Rs.)	39,913	35,260	4,653**	[2.76]
Household non land assets (Rs.)	591,780	566,973	24,807	[0.54]
Household owning land	0.329	0.333	-0.004	(-0.19)
Female-headed household	0.066	0.086	-0.020	(-1.53)
Household size	5.23	5.35	-0.124	[-1.10]
Marriage in the household within the 3 years	0.451	0.422	0.029	(1.18)
Household surveyed after demonetisation	0.414	0.396	0.018	(0.73)
<i>Localisation:</i>			$\chi^2(14) = 6.1$	
Elanthampattu village	0.078	0.086		
Govulapuram village	0.089	0.072		
Karumbur village	0.080	0.094		
Korattur village	0.091	0.093		
Koovagam village	0.072	0.073		
Manapakkam village	0.091	0.082		
Manamthavizhinthaputhur village	0.106	0.099		
Natham village	0.088	0.104		
Oraiyyure village	0.103	0.096		
Poonamallee village	0.005	0.006		
Semakottai village	0.114	0.116		
Sembarambakkam village	0.018	0.014		
Tiruppur region	0.011	0.015		
Villimbakkam region	0.050	0.044		
Walajabad village	0.004	0.004		
Number of observations	833	777		

[t-stat], (z-stat), \* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001

Source: NEEMSIS survey (2016-17). Authors' compilation.

**5.2 Average marginal effects of all variables for discrete changes,  
specifications (1)-(4), (1C)-(4C), (2I)-(4I), (2CI)-(4CI)**

Table A: Average marginal effect of variables on the predicted probability to be indebted (in ppoints), for discrete changes. Logistic regressions analysis, specifications (1) to (4). Sample: all adults

AME of:	CHANGE IN PROBABILITY			
	(1)	(2)	(3)	(4)
sex				
<i>female vs male</i>	-0.083*** (0.022)	-0.083*** (0.022)	-0.056* (0.023)	-0.058* (0.024)
caste				
<i>dalit vs non dalit</i>	0.009 (0.022)	0.006 (0.024)	0.002 (0.024)	0.007 (0.024)
age				
<i>+1 year</i>	0.004** (0.001)	0.004** (0.001)	0.003* (0.001)	0.002 (0.001)
marital status				
<i>unmarried vs married</i>	-0.321*** (0.050)	-0.323*** (0.050)	-0.329*** (0.050)	-0.310*** (0.050)
education:				
<i>primary vs no school</i>	0.116*** (0.028)	0.117*** (0.028)	0.116*** (0.028)	0.115*** (0.028)
<i>secondary or more vs no school</i>	0.046 (0.035)	0.049 (0.036)	0.066 (0.035)	0.072* (0.036)
<i>secondary of more vs primary</i>	-0.070* (0.029)	-0.068* (0.029)	-0.049 (0.029)	-0.043 (0.029)
log(household size)				
<i>+1 SD</i>	-0.072*** (0.012)	-0.070*** (0.013)	-0.068*** (0.013)	-0.065*** (0.013)
number of children				
<i>+1</i>	0.058*** (0.013)	0.057*** (0.013)	0.050*** (0.013)	0.047*** (0.013)
female-headed household				
<i>yes vs no</i>	0.059 (0.037)	0.059 (0.037)	0.054 (0.037)	0.059 (0.036)
marriage in the household				
<i>yes vs no</i>	-0.024 (0.022)	-0.023 (0.022)	-0.027 (0.022)	-0.027 (0.022)
surveyed after demonetisation				
<i>yes vs no</i>	-0.055* (0.027)	-0.055* (0.028)	-0.048 (0.027)	-0.047 (0.027)
log(household p.c. income)				
<i>+1 SD</i>		0.000 (0.012)	-0.002 (0.012)	0.005 (0.012)
household land ownership				
<i>yes vs no</i>		0.004 (0.025)	0.006 (0.025)	-0.011 (0.026)
log(household non land assets)				
<i>+1 SD</i>		-0.008 (0.013)	-0.005 (0.013)	-0.010 (0.013)
employment				
<i>no paid work vs paid work</i>			-0.164*** (0.036)	
main occupation				
<i>casual vs self employment</i>				-0.071* (0.033)
<i>regular vs self employment</i>				-0.175*** (0.040)
<i>no paid vs self employment</i>				-0.245*** (0.043)
<i>regular vs casual employment</i>				-0.104** (0.038)
<i>no paid vs casual employment</i>				-0.174*** (0.039)
<i>no paid vs regular employment</i>				-0.070 (0.044)
localisation dummies	✓	✓	✓	✓
Observations	1610	1610	1610	1610

Computed with Long & Freeze (2014)'s Spost 13 package. Standard errors in parentheses.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table B: Average marginal effect of variables on the predicted probability to be indebted (in ppoints), for discrete changes. Logistic regressions analysis, specifications (1C) to (4C), (2I) to (4I). Sample: all adults

AME of:	CHANGE IN PROBABILITY						
	(1C)	(2C)	(3C)	(4C)	(2I)	(3I)	(4I)
sex							
<i>female vs male</i>	-0.084*** (0.022)	-0.084*** (0.022)	-0.058* (0.023)	-0.060* (0.024)	-0.085*** (0.022)	-0.060** (0.023)	-0.063** (0.024)
caste							
<i>dalit vs non dalit</i>	0.008 (0.022)	0.005 (0.024)	0.002 (0.024)	0.006 (0.024)	0.006 (0.024)	0.003 (0.024)	0.008 (0.024)
age							
<i>+1 year</i>	0.004** (0.001)	0.004** (0.001)	0.003* (0.001)	0.002 (0.001)	0.004** (0.001)	0.003* (0.001)	0.002 (0.001)
marital status							
<i>unmarried vs married</i>	-0.319*** (0.050)	-0.321*** (0.050)	-0.328*** (0.050)	-0.309*** (0.050)	-0.334*** (0.050)	-0.337*** (0.049)	-0.319*** (0.050)
education:							
<i>primary vs no school</i>	0.116*** (0.028)	0.116*** (0.028)	0.115*** (0.028)	0.115*** (0.028)	0.119*** (0.028)	0.117*** (0.028)	0.117*** (0.028)
<i>secondary or more vs no school</i>	0.044 (0.035)	0.047 (0.036)	0.064 (0.035)	0.071* (0.036)	0.045 (0.036)	0.062 (0.035)	0.069 (0.036)
<i>secondary of more vs primary</i>	-0.071* (0.029)	-0.069* (0.029)	-0.051 (0.029)	-0.043 (0.029)	-0.074* (0.029)	-0.055 (0.029)	-0.048 (0.029)
log(household size)							
<i>+1 SD</i>	-0.071*** (0.012)	-0.069*** (0.013)	-0.067*** (0.013)	-0.064*** (0.013)	-0.070*** (0.013)	-0.068*** (0.013)	-0.065*** (0.013)
number of children							
<i>+1</i>	0.057*** (0.013)	0.057*** (0.013)	0.050*** (0.013)	0.047*** (0.013)	0.056*** (0.013)	0.050*** (0.013)	0.047*** (0.013)
female-headed household							
<i>yes vs no</i>	0.058 (0.037)	0.058 (0.037)	0.053 (0.037)	0.059 (0.036)	0.059 (0.037)	0.054 (0.036)	0.059 (0.036)
marriage in the household							
<i>yes vs no</i>	-0.023 (0.022)	-0.023 (0.022)	-0.027 (0.022)	-0.027 (0.022)	-0.023 (0.022)	-0.027 (0.022)	-0.026 (0.022)
surveyed after demonetisation							
<i>yes vs no</i>	-0.054 (0.027)	-0.054 (0.028)	-0.047 (0.027)	-0.046 (0.027)	-0.055* (0.028)	-0.048 (0.027)	-0.048 (0.027)
log(household p.c. income)							
<i>+1 SD</i>		0.001 (0.012)	-0.001 (0.012)	0.005 (0.012)	-0.001 (0.012)	-0.002 (0.012)	0.004 (0.012)
household land ownership							
<i>yes vs no</i>		0.004 (0.025)	0.006 (0.025)	-0.010 (0.026)	0.003 (0.025)	0.006 (0.025)	-0.011 (0.026)
log(household non land assets)							
<i>+1 SD</i>		-0.008 (0.013)	-0.005 (0.013)	-0.010 (0.013)	-0.007 (0.013)	-0.005 (0.013)	-0.010 (0.013)
employment							
<i>no paid work vs paid work</i>			-0.158*** (0.036)			-0.151*** (0.036)	
main occupation							
<i>casual vs self employment</i>				-0.067* (0.033)			-0.069* (0.032)
<i>regular vs self employment</i>				-0.173*** (0.040)			-0.177*** (0.040)
<i>no paid vs self employment</i>				-0.237*** (0.043)			-0.230*** (0.043)
<i>regular vs casual employment</i>				-0.106** (0.038)			-0.108** (0.038)
<i>no paid vs casual employment</i>				-0.169*** (0.039)			-0.161*** (0.039)
<i>no paid vs regular employment</i>				-0.064 (0.044)			-0.053 (0.045)
localisation dummies	✓	✓	✓	✓	✓	✓	✓
2-way interaction sex*caste	✓	✓	✓	✓			
2-way interaction sex*log(household p.c. income)					✓	✓	✓
Observations	1610	1610	1610	1610	1610	1610	1610

Computed with Long & Freeze (2014)'s Spost 13 package. Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table C: Average marginal effect of variables on the predicted debt share (in ppoints), for discrete changes. Fractional Logit regressions analysis, specifications (1) to (4). Sample: adults living in indebted households

AME of	CHANGE IN DEBT SHARE			
	(1)	(2)	(3)	(4)
sex				
<i>female vs male</i>	-0.176*** (0.016)	-0.174*** (0.016)	-0.157*** (0.016)	-0.148*** (0.017)
caste				
<i>dalit vs non dalit</i>	0.023 (0.016)	0.015 (0.017)	0.013 (0.017)	0.020 (0.017)
age				
<i>+1 year</i>	0.004*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.003** (0.001)
marital status				
<i>unmarried vs married</i>	-0.199*** (0.028)	-0.200*** (0.028)	-0.197*** (0.027)	-0.191*** (0.028)
education:				
<i>primary vs no school</i>	0.051** (0.019)	0.054** (0.019)	0.055** (0.019)	0.051** (0.019)
<i>secondary or more vs no school</i>	0.044 (0.024)	0.053* (0.025)	0.063* (0.025)	0.058* (0.025)
<i>secondary of more vs primary</i>	-0.007 (0.020)	-0.002 (0.021)	0.008 (0.021)	0.007 (0.021)
log(household size)				
<i>+1 SD</i>	-0.083*** (0.007)	-0.081*** (0.008)	-0.080*** (0.008)	-0.078*** (0.008)
number of children				
<i>+1</i>	0.048*** (0.009)	0.046*** (0.010)	0.041*** (0.009)	0.040*** (0.009)
female-headed household				
<i>yes vs no</i>	0.113*** (0.031)	0.111*** (0.031)	0.110*** (0.030)	0.106*** (0.030)
marriage in the household				
<i>yes vs no</i>	-0.016 (0.016)	-0.014 (0.016)	-0.016 (0.016)	-0.013 (0.016)
surveyed after demonetisation				
<i>yes vs no</i>	0.005 (0.019)	0.006 (0.019)	0.012 (0.019)	0.013 (0.019)
log(household p.c. income)				
<i>+1 SD</i>		-0.006 (0.009)	-0.006 (0.009)	-0.004 (0.009)
household land ownership				
<i>yes vs no</i>		-0.007 (0.019)	-0.007 (0.018)	-0.023 (0.019)
log(household non land assets)				
<i>+1 SD</i>		-0.009 (0.009)	-0.009 (0.009)	-0.013 (0.009)
employment				
<i>no paid work vs paid work</i>			-0.132*** (0.026)	
main occupation				
<i>casual vs self employment</i>				-0.083** (0.024)
<i>regular vs self employment</i>				-0.117*** (0.027)
<i>no paid vs self employment</i>				-0.203*** (0.032)
<i>regular vs casual employment</i>				-0.035 (0.024)
<i>no paid vs casual employment</i>				-0.120*** (0.028)
<i>no paid vs regular employment</i>				-0.086** (0.031)
localisation dummies	✓	✓	✓	✓
Observations	1600	1600	1600	1600

Computed with Long & Freeze (2014)'s Spost 13 package. Standard errors in parentheses.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



Table D: Average marginal effect of variables on the predicted debt share (in pppts), for discrete changes. Fractional Logit regressions analysis, specifications (1C) to (4C), (2I) to (4I). Sample: adults living in indebted households

AME of	CHANGE IN DEBT SHARE						
	(1C)	(2C)	(3C)	(4C)	(2I)	(3I)	(4I)
sex							
<i>female vs male</i>	-0.176*** (0.016)	-0.174*** (0.016)	-0.158*** (0.016)	-0.150*** (0.017)	-0.175*** (0.016)	-0.161*** (0.016)	-0.152*** (0.017)
caste							
<i>dalit vs non dalit</i>	0.023 (0.016)	0.014 (0.017)	0.012 (0.017)	0.019 (0.017)	0.015 (0.017)	0.013 (0.017)	0.020 (0.017)
age							
<i>+1 year</i>	0.004*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
marital status							
<i>unmarried vs married</i>	-0.197*** (0.028)	-0.197*** (0.028)	-0.196*** (0.027)	-0.190*** (0.028)	-0.206*** (0.027)	-0.204*** (0.027)	-0.198*** (0.027)
education:							
<i>primary vs no school</i>	0.050** (0.019)	0.054** (0.019)	0.054** (0.019)	0.050** (0.019)	0.056** (0.019)	0.056** (0.019)	0.052** (0.019)
<i>secondary or more vs no school</i>	0.042 (0.024)	0.051* (0.025)	0.061* (0.025)	0.056** (0.025)	0.047 (0.025)	0.056* (0.025)	0.051* (0.025)
<i>secondary of more vs primary</i>	-0.009 (0.020)	-0.003 (0.021)	0.007 (0.021)	0.006 (0.021)	-0.009 (0.021)	-0.000 (0.021)	-0.001 (0.021)
log(household size)							
<i>+1 SD</i>	-0.083*** (0.007)	-0.081*** (0.008)	-0.080*** (0.008)	-0.078*** (0.008)	-0.081*** (0.008)	-0.080*** (0.008)	-0.078*** (0.008)
number of children							
<i>+1</i>	0.048*** (0.009)	0.046*** (0.010)	0.042*** (0.009)	0.040*** (0.009)	0.046*** (0.009)	0.042*** (0.009)	0.040*** (0.009)
female-headed household							
<i>yes vs no</i>	0.111*** (0.031)	0.108*** (0.031)	0.108*** (0.030)	0.105*** (0.030)	0.112*** (0.030)	0.111*** (0.029)	0.107*** (0.029)
marriage in the household							
<i>yes vs no</i>	-0.015 (0.016)	-0.013 (0.016)	-0.015 (0.016)	-0.013 (0.016)	-0.013 (0.016)	-0.015 (0.016)	-0.012 (0.016)
surveyed after demonetisation							
<i>yes vs no</i>	0.005 (0.019)	0.006 (0.019)	0.012 (0.019)	0.014 (0.019)	0.007 (0.019)	0.012 (0.019)	0.014 (0.019)
log(household p.c. income)							
<i>+1 SD</i>		-0.005 (0.009)	-0.006 (0.009)	-0.004 (0.009)	-0.004 (0.008)	-0.005 (0.008)	-0.003 (0.008)
household land ownership							
<i>yes vs no</i>		-0.008 (0.019)	-0.007 (0.018)	-0.023 (0.019)	-0.007 (0.018)	-0.007 (0.018)	-0.023 (0.018)
log(household non land assets)							
<i>+1 SD</i>		-0.009 (0.009)	-0.009 (0.009)	-0.013 (0.009)	-0.009 (0.009)	-0.009 (0.009)	-0.013 (0.009)
employment							
<i>no paid work vs paid work</i>			-0.126*** (0.027)			-0.116*** (0.027)	
main occupation							
<i>casual vs self employment</i>				-0.078** (0.024)			-0.080** (0.024)
<i>regular vs self employment</i>				-0.115*** (0.027)			-0.117*** (0.026)
<i>no paid vs self employment</i>				-0.195*** (0.033)			-0.186*** (0.033)
<i>regular vs casual employment</i>				-0.037 (0.024)			-0.037 (0.023)
<i>no paid vs casual employment</i>				-0.117*** (0.028)			-0.106*** (0.029)
<i>no paid vs regular employment</i>				-0.080* (0.031)			-0.069* (0.031)
localisation dummies	✓	✓	✓	✓	✓	✓	✓
2-way interaction sex*caste	✓	✓	✓	✓			
2-way interaction sex*log(household p.c. hh income)					✓	✓	✓
Observations	1600	1600	1600	1600	1600	1600	1600

Computed with Long & Freeze (2014)'s Spost 13 package. Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

### 5.3 Test of a three-way interaction between sex, caste, and logged household per capita income

Table E: Average marginal effect of variables on predicted debt share (in ppoints), for discrete changes. Fractional Logit regressions analysis, specifications (2CI) to (4CI) and (4IxS). Sample: adults living in indebted households

AME of:	CHANGE IN DEBT SHARE			
	(2CI)	(3CI)	(4CI)	(4IxS)
sex				
<i>female vs male</i>	-0.175*** (0.016)	-0.161*** (0.016)	-0.153*** (0.017)	-0.085*** (0.022)
caste				
<i>dalit vs non dalit</i>	0.014 (0.017)	0.012 (0.017)	0.019 (0.017)	0.016 (0.017)
age				
<i>+1 year</i>	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
marital status				
<i>unmarried vs married</i>	-0.204*** (0.027)	-0.202*** (0.027)	-0.196*** (0.027)	-0.180*** (0.027)
education:				
<i>primary vs no school</i>	0.056** (0.019)	0.055** (0.019)	0.051** (0.019)	0.050** (0.019)
<i>secondary or more vs no school</i>	0.046 (0.025)	0.055** (0.025)	0.051** (0.025)	0.051** (0.025)
<i>secondary of more vs primary</i>	-0.009 (0.021)	-0.000 (0.021)	-0.001 (0.021)	0.001 (0.020)
log(household size)				
<i>+1 SD</i>	-0.081*** (0.008)	-0.080*** (0.008)	-0.078*** (0.008)	-0.051*** (0.009)
number of children				
<i>+1</i>	0.046*** (0.009)	0.042*** (0.009)	0.041*** (0.009)	0.028** (0.009)
female headed household				
<i>yes vs no</i>	0.110*** (0.030)	0.110*** (0.029)	0.106*** (0.029)	0.096** (0.030)
marriage in the household				
<i>yes vs no</i>	-0.012 (0.016)	-0.014 (0.016)	-0.012 (0.016)	-0.003 (0.016)
surveyed after demonetisation				
<i>yes vs no</i>	0.007 (0.019)	0.013 (0.019)	0.014 (0.019)	0.012 (0.019)
log(household p.c. income)				
<i>+1 SD</i>	-0.004 (0.008)	-0.005 (0.008)	-0.003 (0.008)	0.009 (0.008)
household land ownership				
<i>yes vs no</i>	-0.008 (0.018)	-0.007 (0.018)	-0.024 (0.018)	-0.024 (0.018)
log(household non land assets)				
<i>+1 SD</i>	-0.009 (0.009)	-0.009 (0.009)	-0.013 (0.009)	-0.016 (0.009)
employment				
<i>no paid work vs paid work</i>		-0.113*** (0.027)		
main occupation				
<i>casual vs self employment</i>			-0.077** (0.024)	-0.043 (0.024)
<i>regular vs self employment</i>			-0.115*** (0.027)	-0.114*** (0.025)
<i>no paid vs self employment</i>			-0.181*** (0.033)	-0.113** (0.035)
<i>regular vs casual employment</i>			-0.038 (0.023)	-0.071** (0.022)
<i>no paid vs casual employment</i>			-0.104*** (0.029)	-0.069* (0.031)
<i>no paid vs regular employment</i>			-0.066* (0.032)	0.002 (0.033)
income share				
<i>+ 1 SD</i>				0.069*** (0.013)
localisation dummies	✓	✓	✓	✓
2-way interaction sex*caste	✓	✓	✓	
2-way interaction sex*log(household p.c. income)	✓	✓	✓	
3-way interaction sex*income share*log(household p.c. income)				✓
Observations	1600	1600	1600	1600

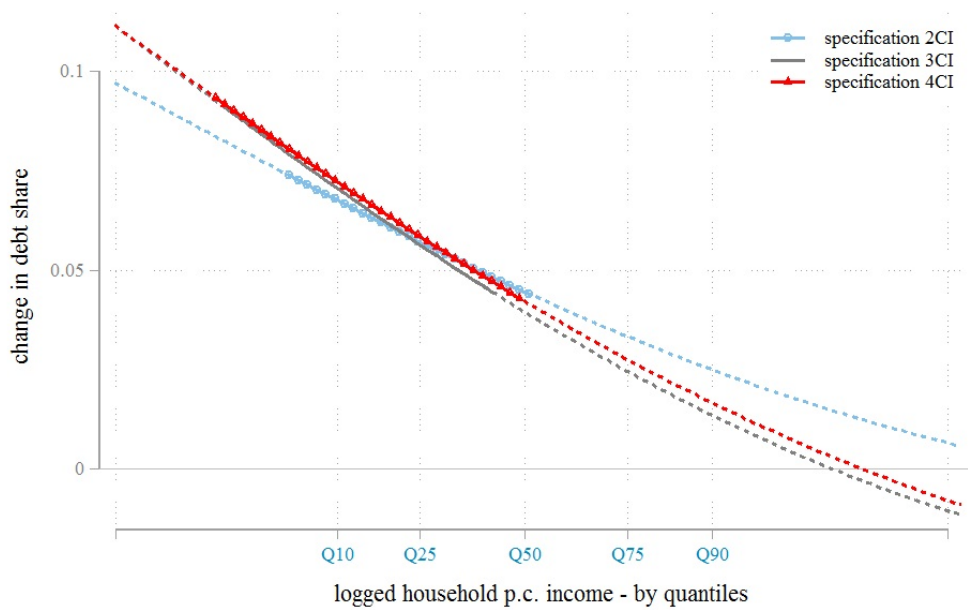
Computed with Long & Freeze (2014)'s Spost 13 package. Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 11: Accumulation of inequalities in the magnitude of borrowing responsibilities. Analysis of fractional Logit regressions of the share of household debts contracted. Results for two two-way interactions: sex and caste, and sex and logged per capita household income (in ppoints). N=1600

	CHANGE IN DEBT SHARE		
	(2CI)	(3CI)	(4CI)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.175*** (0.016)	-0.161*** (0.016)	-0.153*** (0.017)
AME caste (being Dalit vs non Dalit)	0.014 (0.017)	0.012 (0.017)	0.019 (0.017)
AME household p.c. income (being at the Q25 vs Q75)	0.007 (0.012)	0.008 (0.012)	0.005 (0.012)
<i>Two-way interaction between sex and caste:</i>			
AME caste for men	-0.019 (0.023)	-0.017 (0.023)	-0.007 (0.023)
AME caste for women	0.049* (0.021)	0.044* (0.021)	0.047* (0.021)
Second difference	-0.068* (0.030)	-0.061* (0.029)	-0.053 (0.029)
<i>Two-way interaction between sex and household p.c. income:</i>			
AME household p.c. income for men	-0.037* (0.017)	-0.030 (0.017)	-0.034* (0.017)
AME household p.c. income for women	0.054*** (0.014)	0.049** (0.014)	0.046** (0.014)
Second difference	-0.091*** (0.020)	-0.078*** (0.020)	-0.080*** (0.020)
<i>Illustration: differences between ideal-types:</i>			
being a Dalit woman at the Q25 vs a non Dalit woman at the Q75	0.103*** (0.025)	0.093*** (0.025)	0.092*** (0.025)
being a Dalit man at the Q25 vs a non Dalit man at the Q75	-0.056* (0.027)	-0.047 (0.027)	-0.040 (0.027)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* (2): basis controls + logged household p.c.income + logged household non land assets + land ownership dummy. (3): (2) + paid employment dummy. (4): (2)+ main occupation categories. (2CI)-(4CI): (2)-(4) + two-way interaction between sex caste + two-way interaction between sex and logged household p.c. income.



NOTE: AME of caste is significantly different from 0 at the 0.05 level when lines are solid

Figure 3: AME of caste for women on debt share, across the range of household per capita income. Fractional Logit regressions, specifications (2CxI) to (4CxI)

## 5.4 Borrowing responsibilities and contributions to household income: results for a three-way interaction between sex, income share, and logged household per capita income

This section discusses the correlation between borrowing responsibilities and the contribution to household income, and its interplay with household deprivation. It draws on descriptive econometric results for a fractional logit regression including, in addition to main occupation variables, a three-way interaction between sex, income share, and household per capita income (Table 12, Figures 4 to 6 below). First, the level of income share is, as expected, positively correlated to the level of debt share. The average marginal effect of income does not significantly differ between men and women; however, we find a significant interaction effect between sex, income and household per capita income (Table 12, third difference). For men, a marginal increase in income share has on average roughly the same effect on the predicted debt share whatever the level of household per capita income (Figure 5). By contrast, for women, the effect of income share is negatively correlated to the level of household per capita income. The poorer the household, the stronger the effect of income share; it fades as financial strain lightens, and eventually turns not significant above the median of household per capita income. This negative correlation can be related to several mechanisms which are not mutually exclusive. First, unobserved variables determining both female income share and debt share may be correlated to household deprivation (for example male discouragement, resulting in low cooperation). Secondly, a higher income-earning capacity may multiply women's financial responsibilities when money is short, while this would be much less the case in richer households. Last, it could reflect the fact that the poorer the household, the higher the propensity of women to adapt their labour supply to cope with debt repayment.

What are the implications of controlling for individuals' contribution to household income on the association between poverty and financial activity discussed above ? The interaction effects between sex and household per capita income still hold; on average, a higher household per capita income is associated to higher debt shares for men and to

lower debt shares for women (Table 12).

However, behind this average, data suggest that the effect of household per capita income differs according to the level of income share, and especially for women (Figure 5). For women, the marginal effect of household per capita is negatively correlated the level of income share. In particular, it is not statistically significant for women who earn roughly less than 17% of household income (namely two thirds of them). Is this absence of elasticity due to the fact that these women earn too low income to borrow anyway? Figure 6 suggests that it is not the case. As mentioned in the section devoted to descriptive statistics, women tend to earn rather low shares of household income. This pattern can be obscured when solely presenting results across the whole range of income share levels. Figure 6 thereby displays the predicted level of debt share for “ideal-types”, namely a man and a woman with the median income share of male and female income-earners (respectively 52% and 13%). As it turns out, a woman “median-earner” is expected to hold on average a sizable share of household debts, between roughly 15 and 25%. In other words, on average, a woman “median-earner” is predicted to borrow more than she earns in relative terms (13%), across nearly the whole range of household per capita income while this is precisely the opposite for a male “median earner”.

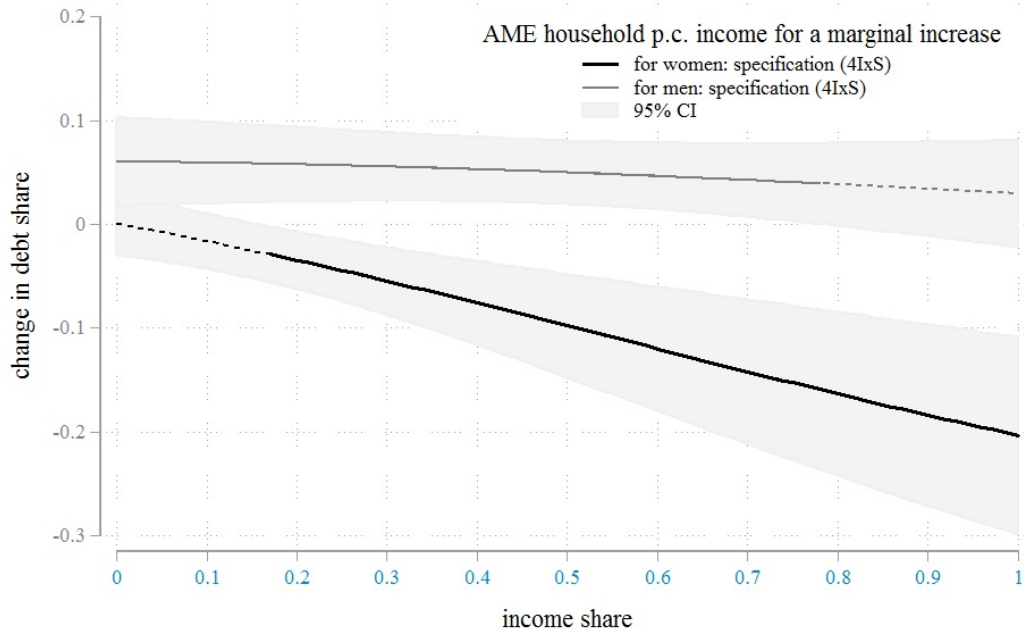
Table 12: Results for a three-way interaction between sex, logged household per capita income and income share, in ppoints. Fractional Logit regression analysis, specification (4IxS). N=1600

	CHANGE IN DEBT SHARE
	(4IxS)
<i>Main effects:</i>	
AME sex (being a woman vs a man)	-0.144*** (0.014)
AME household p.c. income (being at the Q25 vs the Q75)	-0.010 (0.012)
AME income share (+1 ppoint)	0.002*** (0.000)
<i>Two-way interactions:</i>	
AME household p.c. income for men	-0.050** (0.016)
AME household p.c. income for women	0.033* (0.015)
Second difference	-0.083*** (0.020)
AME income share for men	0.002*** (0.000)
AME income share for women	0.002** (0.001)
Second difference	-0.001 (0.001)
AME income share at the Q75	0.001** (0.000)
AME income share at the Q25	0.003*** (0.000)
Second difference	0.001** (0.000)
<i>Three-way interaction:</i>	
AME income share for men in Q75	0.002*** (0.000)
AME income share for women in Q75	0.001 (0.001)
Second difference	0.002 (0.001)
AME income share for men in Q25	0.002*** (0.000)
AME income share for women in Q25	0.003*** (0.001)
Second difference	-0.000 (0.001)
Third difference: (Second difference AME income share at the Q75 by sex) - (Second difference AME income share at the Q25 by sex)	0.002* (0.001)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

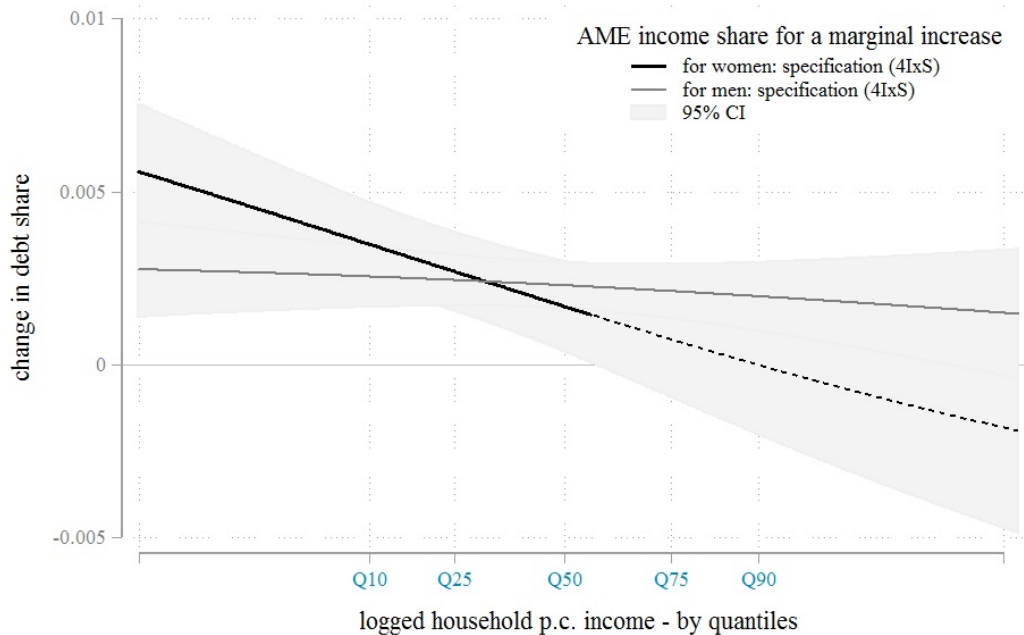
*Specification:* (4IxS): basis controls + logged household non land assets + household land ownership dummy + main occupation categories + income share + three-way interaction between sex, logged household per capita income and income share.





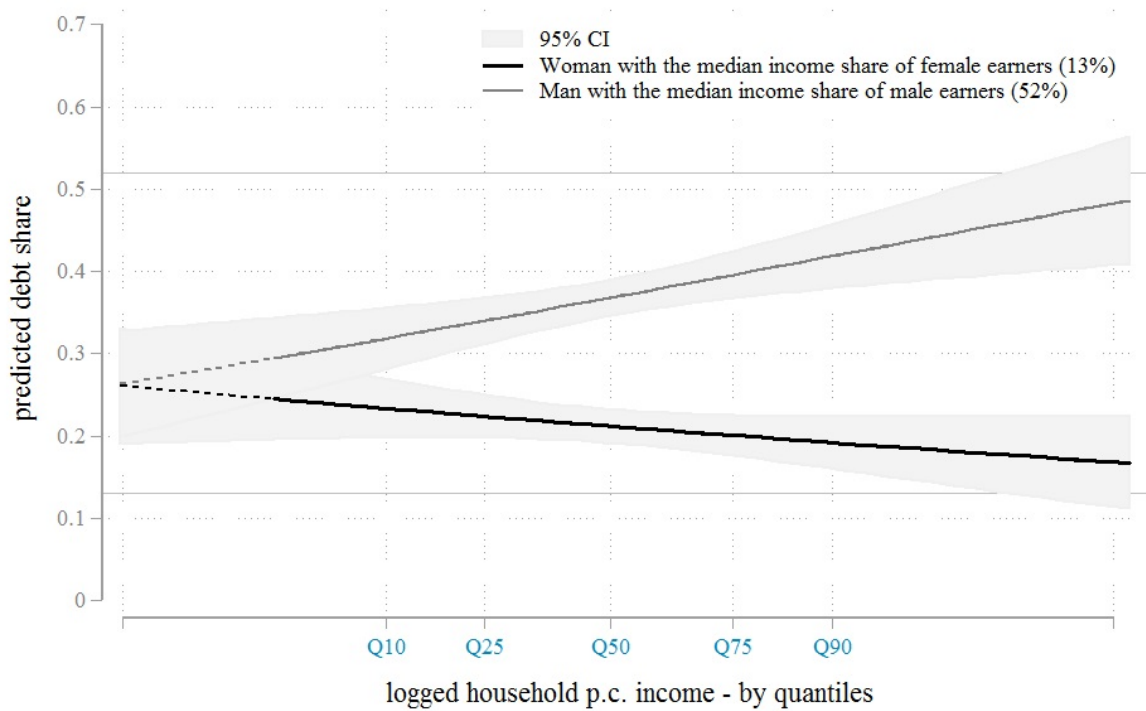
NOTE: AME of household p.c. income is significantly different from 0 at the 0.05 level when lines are solid

Figure 4: Average marginal effects of (logged) household per capita income for a marginal change. Fractional Logit regression analysis, specification (4IxS). N=1600.



NOTE: AME of income share is significantly different from 0 at the 0.05 level when lines are solid

Figure 5: Average marginal effects of income share, for a marginal change. Fractional Logit regression analysis, specification (4IxS). N=1600.



NOTE: Group difference is significant at the 0.05 level when lines are solid

Figure 6: Predicted debt shares for ideal types: men and women with the median income share of male and female earners respectively, across the range of household per capita income. Fractional Logit regression analysis, specification (4IxS). N=1600.

## 5.5 Robustness checks

Table 9bis: Results of interaction effects between sex and caste, and sex and logged household per capita income. Analysis of zero- and one-inflate beta regressions of the share of household debt contracted, results in ppoints. N=1600

Table 9Abis: Results for an interaction between sex and caste

	CHANGE IN DEBT SHARE			
	(1C)	(2C)	(3C)	(4C)
<i>Main effects:</i>				
AME sex (being a woman vs a man)	-0.160*** (0.019)	-0.159*** (0.019)	-0.145*** (0.020)	-0.133*** (0.021)
AME caste (being a Dalit vs a non Dalit)	0.027 (0.019)	0.015 (0.020)	0.014 (0.020)	0.023 (0.020)
<i>Two-way interaction between sex and caste:</i>				
Second difference test	-0.104** (0.035)	-0.106** (0.035)	-0.094** (0.035)	-0.087* (0.034)

Table 9Bbis: Results for an interaction between sex and household p.c. income

	CHANGE IN DEBT SHARE		
	(2I)	(3I)	(4I)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.161*** (0.019)	-0.148*** (0.019)	-0.137*** (0.020)
AME household p.c. income (being at the Q25 vs the Q75)	0.018 (0.015)	0.018 (0.015)	0.014 (0.015)
<i>Two-way interaction between sex and household p.c. income:</i>			
Second difference test	-0.085** (0.024)	-0.073** (0.024)	-0.071** (0.024)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* each regression (for the outcomes having 0% of household debt, 100%, or between the two) includes: (1C)-(4C): (1)-(4) + two-way interaction between sex and caste. (2I)-(4I): (1)-(4) + two-way interaction between sex and logged household per capita income.

(1): basis expanatory variables. (2): (1) + logged par capita income + logged household non land assets + land owner ship dummy. (3): (2) + paid employment dummy. (4): (2) + main occupation variables.

Table 10bis: Unsignificance of a three-way interaction between sex, caste, and logged per capita household income. Analysis of zero- and one-inflated beta regressions of the share of household debts contracted, specifications (2) to (4) supplemented with a three-way interaction. Results in ppoints. N=1600

	CHANGE IN DEBT SHARE		
	(2CxI)	(3CxI)	(4CxI)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.162*** (0.019)	-0.150*** (0.019)	-0.139*** (0.020)
AME caste (being a Dalit vs a non Dalit)	0.014 (0.020)	0.012 (0.020)	0.021 (0.020)
AME household p.c. income (being at the Q25 vs the Q75)	0.017 (0.015)	0.018 (0.015)	0.014 (0.014)
<i>Two-way interactions: second difference tests:</i>			
AME caste by sex (for men - for women)	-0.081* (0.035)	-0.073* (0.035)	-0.067 (0.034)
AME household p.c. income by sex (for men - for women)	-0.069** (0.025)	-0.059* (0.025)	-0.059* (0.024)
AME household p.c. income by caste (for non Dalits - for Dalits)	-0.015 (0.026)	-0.017 (0.025)	-0.024 (0.025)
<i>Three-way interaction: third difference test:</i>			
(Second difference AME caste at the Q75 by sex) - (Second difference AME caste at the Q5 by sex)	0.021 (0.049)	0.028 (0.049)	0.021 (0.048)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* each regression (for the outcomes having 0% of household debt, 100%, or between the two) includes: (2CI)-(4CI): (2)-(4) + three-way interaction between sex, caste and logged household per capita income.

(2): basis expanatory variables + logged par capita income + logged household non land assets + land owner ship dummy. (3): (2) + paid employment dummy. (4): (2) + main occupation variables.

Table 11bis: Results for 2 two-way interactions: between sex and caste, and sex and logged household per capita income. Analysis of zero- and one-inflate beta regressions of the share of household debt contracted, results in ppoints. N=1600

	CHANGE IN DEBT SHARE		
	(2CI)	(3CI)	(4CI)
<i>Main effects:</i>			
AME sex (being a woman vs a man)	-0.161*** (0.019)	-0.149*** (0.019)	-0.138*** (0.020)
AME caste (being Dalit vs non Dalit)	0.014 (0.020)	0.013 (0.020)	0.022 (0.020)
AME household p.c. income (Q25 vs Q75)	0.018 (0.015)	0.018 (0.015)	0.014 (0.015)
<i>Two-way interactions: second difference tests:</i>			
AME caste by sex (for men - for women)	-0.082* (0.036)	-0.076* (0.035)	-0.070* (0.035)
AME household p.c. income by sex (for men - for women)	-0.072** (0.025)	-0.062** (0.025)	-0.061* (0.024)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specifications:* each regression (for the outcomes having 0% of household debt, 100%, or between the two) includes: (2CI)-(4CI): (2)-(4) + two-way interaction between sex and caste + two-way interaction between sex and logged household per capita income.

(2): basis expanatory variables + logged par capita income + logged household non land assets + land owner ship dummy. (3): (2) + paid employment dummy. (4): (2) + main occupation variables.

Figure 7: Comparison between the average marginal effects of sex and caste on predicted debt share, as estimated by fractional Logit regression and by zero- and one-inflated beta regression (for brevity, only four comparisons out of seven are reported). N=1600.

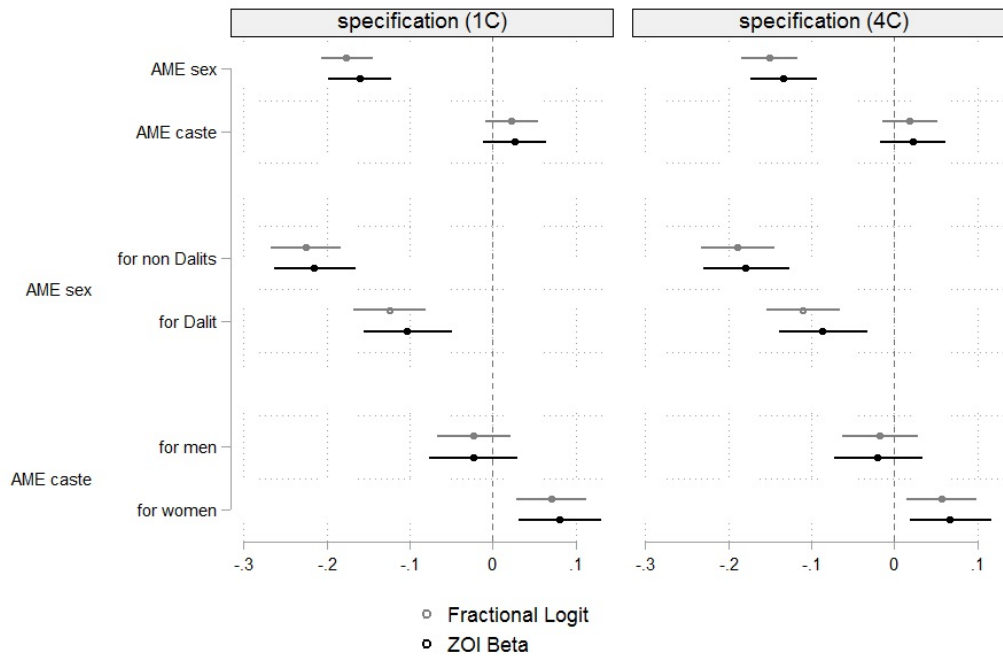


Figure 7A: Results with an interaction between sex and caste

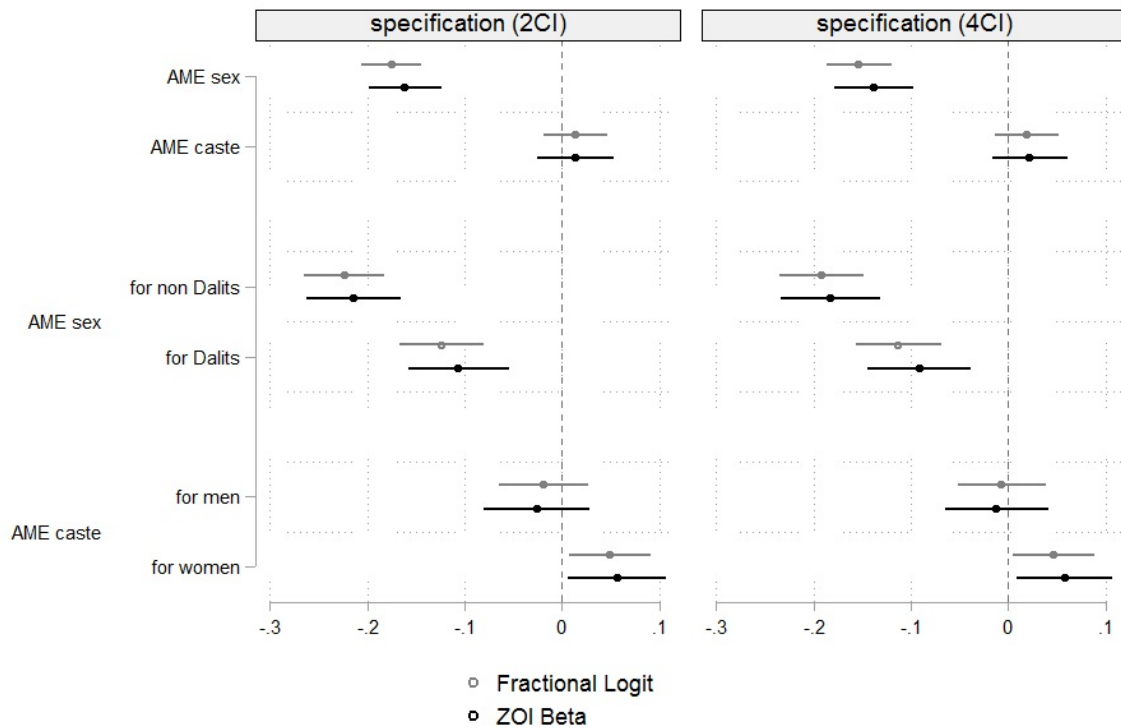
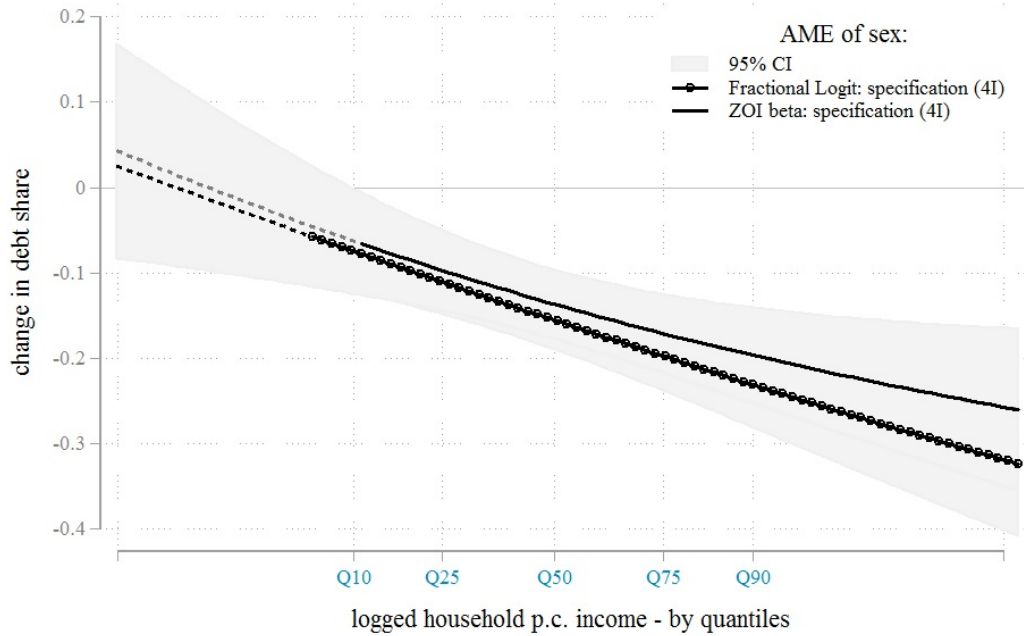


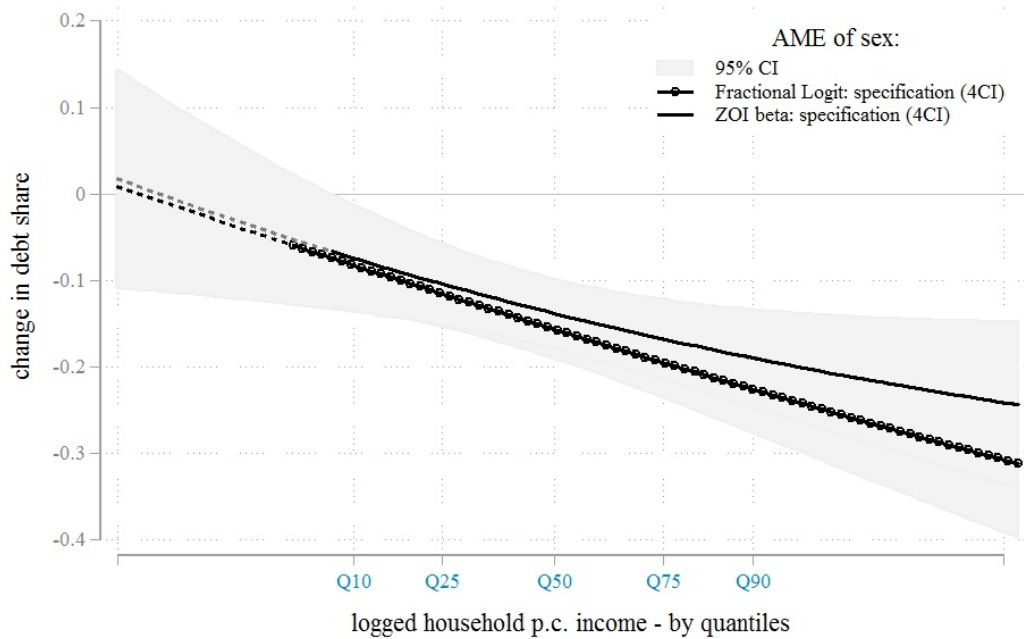
Figure 7B: Results with two interactions: sex and caste, sex and logged household p.c. income

Figure 8: Comparison between the average marginal effects of sex on the predicted debt share across the range of household per capita income, as estimated by fractional Logit regression and by zero- and one-inflated beta regression (for brevity, only two comparisons are reported out of six). N=1600.



NOTE: AME of sex is significantly different from 0 at the 0.05 level when lines are solid

Figure 8A: Results with an interaction between sex and logged household p.c. income (specification (4I))



NOTE: AME of sex is significantly different from 0 at the 0.05 level when lines are solid

Figure 8B: Results with an interaction between sex and logged household p.c. income, and an interaction between sex and caste (specification (4CI))

Table 12bis: Results for a three-way interaction between sex, logged household per capita income and income share, in ppoints. Zero- and one-inflated beta regression analysis, specification (4IxS). N=1600

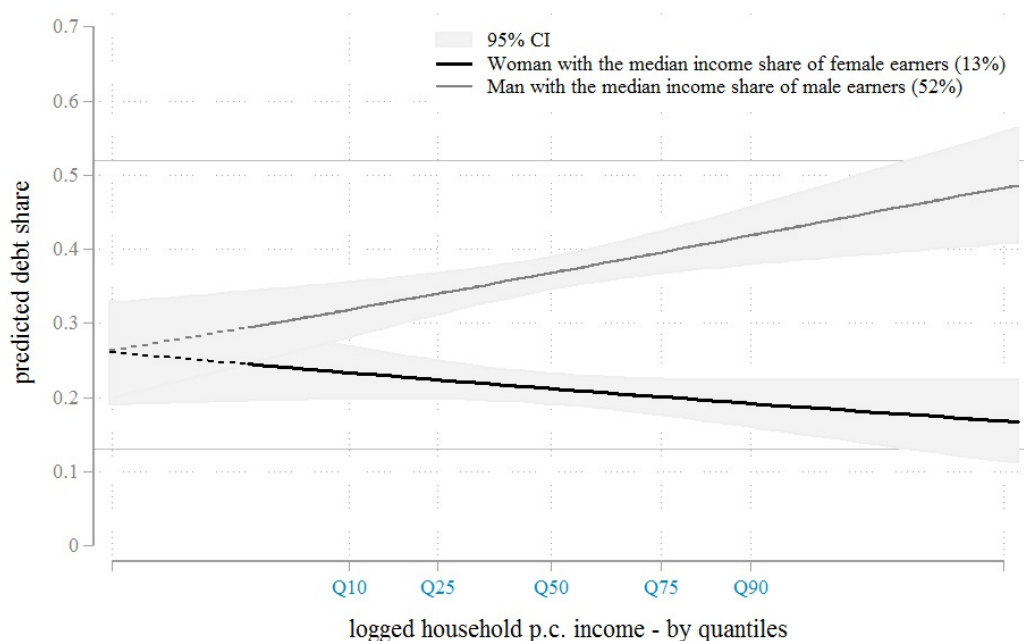
	CHANGE IN DEBT SHARE (4IxS)
<i>Main effects:</i>	
AME sex (being a woman vs a man)	-0.130*** (0.018)
AME household p.c. inc (being at the Q25 vs the Q75)	-0.004 (0.015)
AME income share (+1 ppoint)	0.002*** (0.000)
<i>Two-way interactions: second difference tests:</i>	
AME household p.c. income by sex (for men - for women)	-0.054* (0.025)
AME income share by sex (for men - for women)	-0.000 (0.001)
AME income share by household p.c. income level (at the Q75 - the Q25)	0.001** (0.000)
<i>Three-way interaction: third difference test:</i>	
(Second difference AME income share at the Q75 by sex) - (Second difference AME income share at the Q25 by sex)	0.002* (0.001)

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , two-tailed tests.

*Specification:* each regression (for the outcomes having 0% of household debt, 100%, or between the two) includes: (4IxS): basis expanatory variables + logged household non land assets + land ownership dummy + main occupation variables + three-way interaction between sex, income share and logged household per capita income.

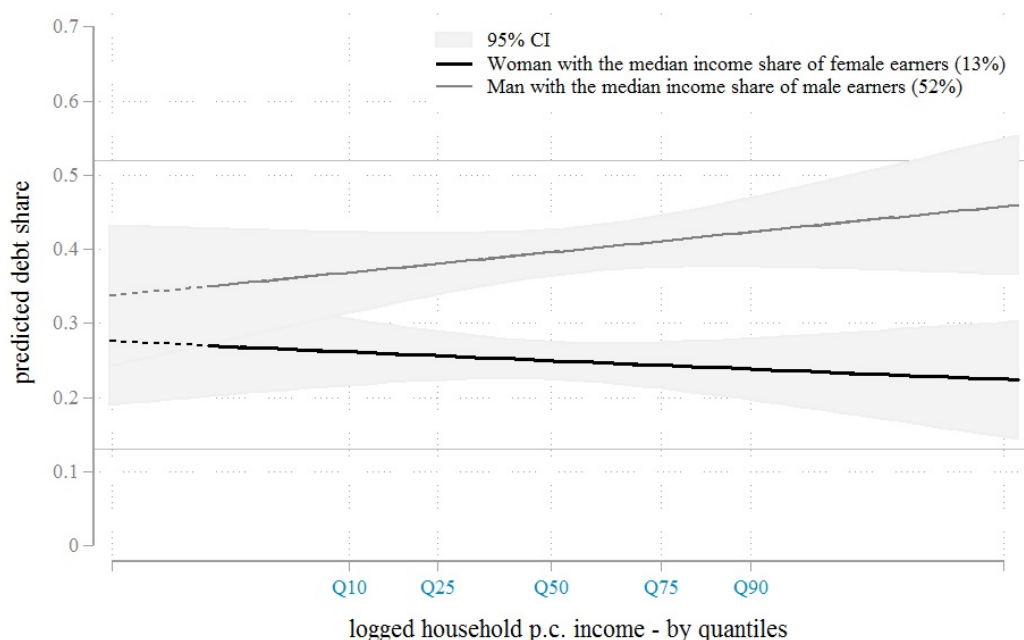


Figure 9: Comparison of predicted debt shares for ideal types: men and women with the median income share of male and female earners respectively, across the range of household per capita income. N=1600.



NOTE: Group difference is significant at the 0.05 level when lines are solid

Figure 9A: Results with Fractional Logit regression (specification (4IxS))



NOTE: Group difference is significant at the 0.05 level when lines are solid

Figure 9B: Results with zero- and one-inflated beta regression (specification (4IxS))

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