

Indebtedness in Rural India: The Contribution of Cognitive Skills and Personality Traits

Arnaud Natal^{*} & Christophe J. Nordman[†]

Very preliminary draft

August 6, 2021

Abstract

Keywords : Gender, caste, debt burden

1 Introduction

Since more than a decade, there has been increasing interest in psychology in economics literature, especially through personality traits and cognitive skills (PT&CS). The relevance of such analysis in economics is well documented in the literature. Hanushek and Woessmann (2008) shows that cognitive skills are correlated with individual earnings, distribution of income and economic growth and other factors such as well-functioning economic institutions –although enter into growth and may well have stronger effects, may also amplify the effects of cognitive skills. Regarding personality traits, Borghans, Duckworth, Heckman, and ter Weel (2008) examines, for instance, the relevance of personality traits in economics. They show that psychological variables are a good predictor of socioeconomic success and especially on labour market¹. Institutions such as World Bank collecting more and more data² on PT&CS because it enable a better understanding of skill requirements in the labor market, backward linkages between skills acquisition and educational achievement, personality, and social background, and forward linkages between skills acquisition and living standards, reductions in inequality and poverty, social inclusion, and economic growth (Valerio, Sanchez Puerta, Pierre, Rajadel, & Monroy Taborda, 2014).

^{*}Univ. Bordeaux, CNRS, GREThA, UMR 5113, F-33600 PESSAC, FRANCE - arnaud.natal@u-bordeaux.fr

[†]IRD, UMR LEDa-DIAL, IFP - nordman@dial.prd

¹For further details see Almlund, Duckworth, Heckman, and Kautz (2011).

²As stated by Laajaj and Macours (2019), the World Bank alone spent 1 billion USD a year.

Cognitive skills represent the mental processes involved in the acquisition of knowledge, manipulation of information, and reasoning that include the domains of perception, memory, learning, attention, decision making, and language abilities (Kiely, 2014) while personality is the dynamic organization within the individual of those psychophysical systems that determine his characteristics behavior and thought (Allport, 1961). The Big-5 model constitute the main personality trait taxonomy³. It identify five dimensions of personality: neuroticism –or emotional stability– (the capacity to experience negative emotions); extraversion (the capacity to experience positive emotions, the tendency to seek stimulation and company from others); openness to experience (capacity to be creative and unstructured); agreeableness (perceptions of others that are caring, compassionate, and altruistic); conscientiousness (capacity to display self-discipline, act dutifully, and strive for achievement against measures or outside expectations).

Studies in economics focuses on the role of skills on labour market and especially on income gap, performance at work and type of work or education through educational attainment, course grades or standardised achievement test scores but few researcher have been interested in the relationship with household finances while it is a growing area of interest. First, household are more implicated in financial decision such as privatization of retirement pension, liberalization of loan market, increase in credit purchase, which are more complicated because of financial innovation (Guiso & Sodini, 2013). Second, financial inclusion policies focus on credit as a potential tool for business creation, improved access to education and health, enhanced decision-making and women's empowerment. It constitute the main focus of the World Bank Group's Universal Financial Access 2020 initiative and featured as a target in eight of the 17 goals of sustainable development goals. Nevertheless, it is a known fact that debt and credit are two sides of the same coin: If the investment goes well, debt is protective and productive (which it is called credit) but if it goes wrong –if the return on investment is less than the cost of the loan, or is obtained too late, if the debt is only used to make ends meet (Guérin, Michiels, Natal, Nordman, & Venkatasubramanian, 2021)– the debt can be source of impoverishment and destruction. The choice of terms reflects ambivalence of terms (Peebles, 2010).

Research build a bridge between household finance and individual skills through the notion of financial literacy which measure how well an individual can understand and use personal finance-related information (Gaurav & Singh, 2012; Hastings, Madrian, & Skimmyhorn, 2013; Horn, Jamison, Karlan, & Zinman, 2021; Huston, 2010; Klapper, Lusardi, & Panos, 2012) but the few studies that have focused on household finance mainly investigate the risk aversion, financial distress, savings and debt. Nga and Yien (2013) show that conscientiousness, openness

³Among the theories of personality, the traits can be defined as thought, emotion and habitual patterns of behavior (Kassin, 2003).

to experience and agreeableness are correlated with risk aversion, cognitive biases and socially responsible investing for undergraduate students of Malaysia. For 4,000 individuals from Netherland, [Pinjisakikool \(2017\)](#) shows that all the Big-5 personality traits are good predictor of financial risk tolerance as [Bucciol and Zarri \(2017\)](#) that shows that agreeableness, cynical hostility and anxiety are good predictor of financial risk taking for 11,000 individuals from USA (negative correlation). In terms of financial distress, [Agarwal and Mazumder \(2013\)](#) shows that individuals with high math scores are less likely to make financial distress in USA. [Parise and Peijnenburg \(2019\)](#) are one of the only who deal with causality. Using instrumental variable⁴ on Dutch dataset, they shows that people in the bottom quintile of personality traits are 10 times more likely to experience financial distress than those in the top quintile. Regarding saving behaviour, [Gerhard, Gladstone, and Hoffmann \(2018\)](#) decompose 3,000 individuals from UK in two groups (striving and established) and find that agreeableness is negatively correlated with total household savings for both groups and the effect is stronger for the striving than for the established. [Nyhus and Webley \(2001\)](#) shows that extraversion is negatively correlated with savings for 1,300 individuals from Netherland and they shows that emotional stability is positively correlated with debt. [Brown and Taylor \(2014\)](#) finds that extraversion and agreeableness are positively associated with the level of debt held while conscientiousness is negatively correlated with the level of unsecured debt for 10,000 individuals of UK and [Forlicz and Rólczyński \(2019\)](#) shows differences between debtors and debt-free individuals in terms of conscientiousness, honesty, attitude towards money and shopping for 3,700 individuals from Poland, Spain, Romania and Italy.

To our knowledge, no articles has looked at personality trait⁵ and cognitive skills on debt in India (nor even in developing countries) while understand the relationship is essential in the Indian context because of the uniqueness of indebtedness. Debt represent more than money, it is a social link where individual defining them and thinking of them according to their indebtedness and indebtedness relationship are closely nested in social relationship ([Guérin, 2014](#)). Recent crisis such as microfinance crisis ([Nair, 2011; Sriram, 2010](#)), demonetisation ([Guérin, Lanos, Michiels, Nordman, & Venkatasubramanian, 2017](#)) or lockdown ([Guérin, Michiels, et al., 2021; Guérin, Mouchel, & Nordman, 2021](#)) has highlighted the importance of furthering our understanding of indebtedness at individual and household level in India.

Since the 80's, the incidence of indebtedness increase for rural and urban households (respectively from 19 to 32% and from 17 to 22%) with an increasing in the share of household

⁴They instruments conscientiousness and emotional stability with childhood trauma.

⁵[Michiels, Nordman, and Seetahul \(2021\)](#) interesting in the link between PT&CS and labour mobility. [Dasgupta, Mani, Sharma, and Singhal \(2020\)](#) interesting in the disparities in terms of PT&CS between castes.

indebted to formal (or institutional) sources (11 to 17%) and informal sources⁶ (10 to 19%) (Rajakumar, Mani, Shetty, & Karmarkar, 2019). As we discuss in section 2.1, this number is largely under-estimate (Jones, 1994) and micro-level studies indicates incidence of debt around 80-90% (Drèze, Lanjouw, & Sharma, 1997; Guérin, D'Espallier, & Venkatasubramanian, 2013; Jones, 1994; Reboul, Guérin, & Nordman, 2021). The average amount of debt per household strongly increased between 1951 and 2012 (from 83 INR to 32,522 INR) with an increasing in the share of formal debt (from 7 to 56% for rural households) and, thus, a decreasing in the share of traditional informal debt (from 93 to 43% for rural households) (Rajakumar et al., 2019).

The situation is not homogenous among individuals, many disparities coexist between caste and gender. Guérin et al. (2013) show that the caste affect borrowing strategies as amount, type and source of debt in rural Tamil Nadu, India. Dalits, have higher incidence of indebtedness but borrow smaller amounts and more frequently from ambulant lenders (Guérin et al., 2013). They borrow less for economic reason than non-dalits but more for household expenditures (Guérin et al., 2013; Guérin, Roesch, Venkatasubramanian, & Kumar, 2014). Finally, they have the lower access⁷ to bank loans while it offer “the best conditions financially speaking” (low interest rate, higher amounts, long duration) (Chavan, 2007; Guérin et al., 2013). Over gender, Reboul et al. (2021) show that the relative amount of debt is higher for female than for male while male earn much more. Moreover, female in the poorest households have the highest borrowing responsibilities and dalit female tend to face higher debt burdens than non-dalit one. In terms of use, male borrow more for economic investment while female more for daily survival and debt repayment (Reboul et al., 2021). Recents crises previously listed have exacerbate disparities between caste and sex to the detriment of dalits and female (Guérin, Michiels, et al., 2021; Guérin, Mouchel, & Nordman, 2021).

Disparities in terms of debt is one aspect of inequalities between caste and gender. Another important concerns is find in aspirations. Mukherjee (2017) show that gender and caste primes can significantly affect long run aspirations and beliefs. Alvi, Ward, Makhija, and Spielman (2019) use priming⁸ to study the effect of identity salience on aspirations. They find that when female are primed on gender, they exhibit higher aspirations for their daughters and low-case female primed on caste are more aspirational for their daughters. Last, Sarkar, Chakravorty, and

⁶In part due to the economic and financial sector reforms of 1991: <http://indiabefore91.in/1991-economic-reforms>.

⁷In part, because of they does not have necessary guarantee (i) such as good land (irrigated one and good location), specific know-how (ii), or because they self-excluded themselves because dalits are persuaded to fail (Guérin et al., 2013).

⁸Priming, in cognitive psychology, is “the effect in which recent experience of a stimulus facilitates or inhibits later processing of the same or a similar stimulus.” – <https://dictionary.apa.org/priming>. Accessed June 21, 2021.

Lyonette (2020) show that caste and gender work as double jeopardy instead of intersectionality for aspirations. Indeed, the most socially disadvantaged groups have significantly lower income aspiration when compared to Other Backward Class and Other Caste participants and female participants also have significantly lower aspiration than their male counterparts. Moreover, most socially disadvantaged female participants have lower income aspiration levels compared to other groups.

Beyond being a source of inequality, caste and gender seems to deeply impact individuals by conditioning them. In this context it appears important to investigate the role of PT&CS on indebtedness in take into account the deepness of this social identity.

Thus, in a context marked by numerous crises, where indebtedness –and all that it represents on the social level– is predominant with growing inequalities, study the relationship with PT&CS appears full of meaning. In this article we investigate how PT&CS shape indebtedness situation? (i) and more finely, how the PT&CS varies across the indebtedness distribution? (ii). Then, we analyse how PT&CS influences the debt trajectory (iii)? and how does debt change over time as PT&CS changes? (iv). At the same time, we try to capture the weight of social identity by investigating the contribution of PT&CS for each social groups: do individuals manage to differentiate themselves through their skills?

By providing descriptive and econometric empirical insights, this paper contributes to furthering our understanding of the determinants of individual indebtedness –which is rare and valuable in developing countries, as well as, contributing more generally to the expanding literature exploring the implications of PT&CS for economic outcomes.

The rest of the article is organised as follow: section 2 is devoted to data and methodology, then, in section 3 we discuss some descriptive statistics to highlight the weight of social identity before exploring and discussing the relationship between PT&CS and indebtedness in section 4.

2 Data and methodology

2.1 Data

Our empirical analysis is based on the NEEMESIS-1 & NEEMESIS-2 (Networks, Employment, dEbt, Mobilities and Skills in India Survey) surveys carried out respectively in 2016-17, and 2020-21 (Nordman, Guérin, Michiels, Natal, & Venkatasubramanian, 2019; Nordman et al., 2017). This survey was the second and third waves of a longitudinal data collection project start in 2010 with RUME (RURAL Microfinance and Employment survey) project in ten villages of Tamil Nadu. Located in the Cuddalore and Villupuram districts, a mostly agricultural area,

economies benefits from the proximity of two large industrial towns (Neyveli and Cuddalore) and a regional business center (Panruti).

RUME randomly selected 405 households using stratified sample framework based on three dimensions: proximity to small towns (Panruti, Villupuram and Cuddalore), an agro-ecological criterion, and caste affiliation. Thus, half of villages are irrigated (the other half have dry lands) and within villages, half of the sample was selected from the mostly upper and middle caste part of the village (Ur) while the other half from the Colony part, where dalits (the ex-untouchables) mainly live. NEEMSIS-1 recovered 388 households (4.19% attrition rate) and randomly selected 104 news households (for a total of 492 households) from these 10 villages, based on the same method. NEEMSIS-2 recovered 485 households (1.42% attrition rate) from 2016-17 and recovered 10 households from 2010 that were not recovered in 2016-17. Moreover, 100 news households were randomly selected (for a total of 595 households).

In NEEMSIS-1 & NEEMSIS-2, two household members, called “ego 1” (mostly household questionnaire respondent) and “ego 2” (one younger household member randomly selected on a criterion of age), are directly addressed individual questionnaires that provide for instance a range of information on PT&CS.

NEEMSIS’s surveys stands out from other Indian data sources such as the All India Debt and Investment Survey (AIDIS), 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).

Regarding the reliability, the great expertise of the team⁹, helped to formulate questions appropriately. This for instance involved using particular terms that are less degrading than the generic term “debt” lists of the main local lenders, and asking indirect questions. As stated by [Reboul et al. \(2021\)](#) (who used the same data sets) “data accuracy is [...] reflected by an incidence of indebtedness found higher than in the estimates of the nation-wide AIDIS: 99% of households are in debt in our case study, as opposed to 30% in rural Tamil Nadu in 2012 according to the AIDIS ([NSSO, 2014](#)).”

Moreover, the moderate magnitude of the survey, compared to nationally representative datasets, ensures the high quality of the data and the tablet-based mode of data collection improved data quality in including constraints on answers to prevent inconsistencies.

⁹Some members of the research team are present since more than 20 year on the region for numerous quantitative and qualitative surveys.

2.2 Construction of personality traits & cognitive skills variables

As stated earlier, our survey allow us to construct measures of cognitive skills. It include three score variables: literacy test, numeracy test and Raven progressive-matrices test¹⁰. These scores are construct in adding up the correct answers of a set of four questions for literacy and numeracy (six for 2020-21) test and 36 for Raven. Then, we standardize the score to ensure comparability of results between personality traits and cognitive skills.

Regarding Big-5, on the basis of 35 questions, we averaged answers –based on a Likert scale from 1–“Almost Never” to 5–“Almost always”, that belong to a determined trait after correcting for acquiescence bias¹¹ (see Appendix B). The resulting mean represent the score on each traits.

McDonald's Ω ¹², a measure of internal consistency, are mostly satisfactory for 2016-17 data corrected from acquiescence bias: 0.81 for openness; 0.86 for conscientiousness; 0.59 for extraversion; 0.60 for agreeableness and 0.80 for emotional stability (see Figure 1). For 2020-21, the internal validity after correcting for acquiescence bias is not ideal compared to non-corrected items. It implies that results could suffer from measurement error, which would bias our results towards zero.

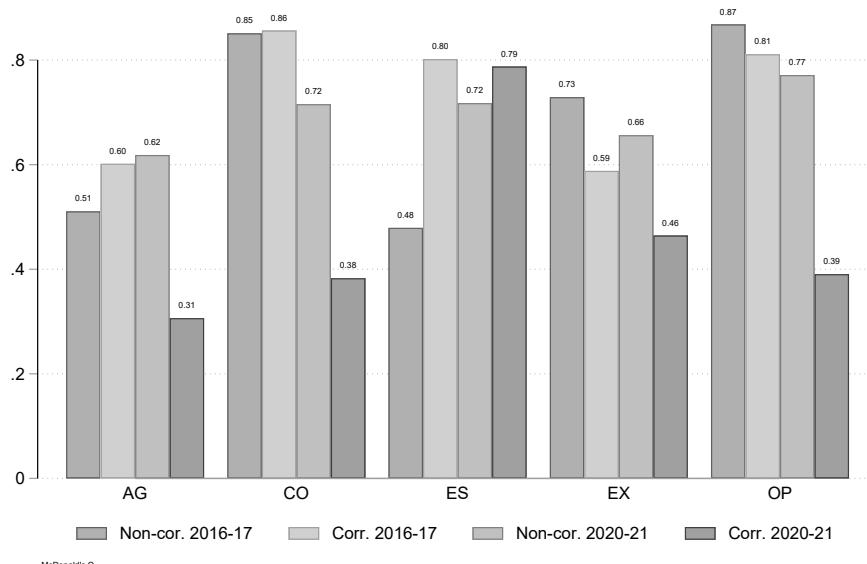


Figure 1: Internal consistency of Big-5 personality traits – Distribution of McDonald's Ω through time and correction for 953 individuals in 2016-17 and 1,316 in 2020-21 from rural Tamil Nadu, India.
Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21); author's calculations.

¹⁰Raven test is “a nonverbal test of mental ability consisting of abstract designs, each of which is missing one part. The participant chooses the missing component from several alternatives to complete each design.” – <https://dictionary.apa.org/ravens-progressive-matrices>. Accessed January 27, 2021.

¹¹Acquiescence bias represent the tendency to answer more in one direction (agree or disagree) over the other.

¹²Literature on internal consistency estimators increasingly agrees that Cronbach's α –the most wide used estimator, is maybe not very efficient (Bourque, Doucet, LeBlanc, Dupuis, & Nadeau, 2019; Trizano-Hermosilla & Alvarado, 2016).

As warned by Laajaj et al. (2019), the Big-Five taxonomy is limited in developing countries for several reasons: the enumerator-respondent interactions in face-to-face survey can induce a bias; the low education levels can make questions more difficult to understand and can induce a systematic response patterns, especially the acquiescence bias. The very good knownledge of the field (see section 2.1) allow us to collect data of high quality and avoid a bias due to misunderstanding of questions. Moreover, we implement our own factor analysis of the 35 questions by principal component with promax rotation. To avoid a bias in factor analysis, we do not recoded reverse questions because it might force likeness with Big-5 taxonomyIn our dataset, acquiescence bias is measure with a set of reverse questions that are supposed perfectly opposed to another set of questions. However, the assumption of opposition is supportable only in the Big-5 taxonomy, in another layout pairs of questions can measure different aspects of personality. The resulting factors for 2016-17 data are relatively similar to the Big-5 personality traits with satisfactory McDonald's Ω : Factor 1 as Openness-Extraversion ($\Omega = 0.91$); Factor 2 as Conscientiousness ($\Omega = 0.88$); Factor 3 as *Porupillatavan* –tamil terms for talkative, easily distracted individual– ($\Omega = 0.69$); Factor 4 as Emotional stability ($\Omega = 0.78$) and Factor 5 as Agreeableness ($\Omega = 0.62$) (see Appendix B) while resulting factors for 2020-21 data are very different to the Big-5 taxonomy and to the 2016-17 factors¹³.

To mitigate against the potential problem of life-cycle events –that might induce endogeneity through measurement error– [or to remove the effect of age on the PT&CS measures], we run univariate OLS regression with cognitive skills and personality traits as endogenous variables and age as exogenous variable. We standardised the resulting residuals and use it at as age-effect-free PT&CS or net of life cycle influences (Brown & Taylor, 2014; Groves, 2005; Nyhus & Pons, 2005).

The exogeneity of PT&CS is well assume because of stability over time while there is no consensus in psychology (Ardelt, 2000; Deary, 2014). Our data allow us to examine stability over time of PT&CS for 835 individuals of rural India.

For personality traits, according to Costa and McCrae (1997); McCrae et al. (2000) it remains stable, in part, because it is a genetic predisposition that, by definition, cannot be changed over life. Many economist¹⁴ follow this path and the majority of them assume stability over time after the age of 25 and other verify this stability (Cobb-Clark & Tan, 2011). The stability refutes sociological and psychological literature which interesting in the influence of childhood and

¹³We do not present results here because we do not use it as personality traits measure, however it is available on request. See section 2.4.

¹⁴But not all, see Almlund et al. (2011); Borghans et al. (2008); Heckman (2011). As stated by Heckman (2011), “Personality traits are not set in stone. They change over the life cycle. They are a possible avenue for intervention and policy.”

adulthood socialization on personality (Moen, Elder Jr., & Lüscher, 1995; Mortimer & Simmons, 1978). Following this path, Ardelt (2000) state that “personality can change over the course of a person’s life, particularly if age at first measurement is low or over 50, if the retest interval is large, if individual personality aspects rather than the overall personality are considered, and if personality aspects other than the big five [...] traits are assessed.” Our results show a stability for minor part of the population (see Appendix A). Non-corrected traits, in addition to having globally (2016-17 and 2020-21) higher internal consistency (see Table 1) are less unstable over time without being able to relate stability.

Concerning cognitive skills, majority of individuals have higher –or equal– score in 2020-21 than in 2016-17 (see Appendix A) which corroborate with the lifelong learning theory. It is the continuing development of knowledge and skills that people experience after formal education and throughout their lives (London, 2011).

2.3 Indebtedness measures

There is no consensus in the literature to measure indebtedness but three approaches are often retained. Objective measures focus on the ability (or inability) to service or repay debts. Typically, it is the debt to income ratio, debt to asset ratio, debt service ratio. Although this is the most widely used measure, it under-estimate the burden of debt in ousting personal feeling and sacrifice associated with debt and over-indebtedness (Betti, Dourmashkin, Rossi, & Yin, 2007).

Subjectives measure assume that “individual households are the best judges of their own net debt/wealth position” (Betti et al., 2007). The robustness of the results are based on the degree of honesty and literacy of individuals that can make it, sometimes, less reliable (D’Alessio & Iezzi, 2013). As stated by Rinaldi and Sanchis-Arellano (2006) and Keese (2012), in general, objective measures align quite well with subjective measures at the household classification level.

Last, administrative measures treat indebtedness as “all cases where non-payment of debts have been registered officially or declared before a court” (Betti et al., 2007). In rural Indian context, this type of measures have little meaning since most of the debt is informal.

It is recommended to analyse indebtedness at household level because generally income is grouped between household members (Fondeville, Ozdemir, & Ward, 2010). However, in order to explore the role of individual characteristics such as PT&CS on indebtedness, we focus on two types of individual objective measures allowing us to understand the debt from three angles. First, we investigate the size of the individual debt with the total amount of individual

debt taken out in her own name. Second, we investigate the burden of debt repayment with the individual debt service ratio (DSR). It represent the share of income required to cover the repayment of interest and principal on a debt for one year. We also complete the analysis with the probability for an individual to being in debt to capture the role of PT&CS on the incidence of debt.

2.4 Econometric framework

In order to better understand the relationship, our analysis take place in three step.

How PT&CS shape individual debt? In a first step, we use the five factor of 2016-17 factor analysis as personality traits (X'_i) on individual debt of 2020-21 to understand how personality shapes individual debt. Our analysis faces non-random sample selection issues because of the nature of our dependent variables: the sample is restricted to those who declared a non-zero and non-missing debt. We therefore do not account for entry and exit in debt by only considering total loan amount and debt service ratio. To overcome this sample selection issue, it is rigorous to use the Heckman procedure, which involves estimating a model of debt participation, where this is conditioned on factors additional to those that determine the amount of debt borrowed (exclusion restriction variables). Strong theoretical background is needed to determine exclusion restriction variables that affect the participation decision but not the amount of debt. [Lennox, Francis, and Wang \(2011\)](#) point out that an absence of exclusion restriction in the first stage can lead to severe multicollinearity in the second stage. [Cox and Jappelli \(1993\)](#) used years of education, occupation, area income, employment status and rural-urban status and [Bertaut and Starr \(2002\)](#) used the proportion of household heads employed in the financial services in the region and the proportion of household heads employed in a workplace of 500 or more. [Duca and Rosenthal \(1993\)](#) and [Crook \(2001\)](#) assumed that the same variables determined the probability of having debt and the amount borrowed. [del Río and Young \(2006\)](#) used localisation, race and employment status. However, their results from Heckman procedure are no different from those from OLS regressions, suggested that “any corner-solution biases are small”. Therefore, they focus separately on the participation equation and on debt equations (excluding non-participants). We follow [del Río and Young \(2006\)](#) in focusing separately on the participation equation and on debt equations in excluding non-participants. We also estimate a Heckman selection model as robustness check with the household debt dependency ratios –defined as the number of indebtedness individuals divided by the total number of household members, in 2016-17– as exclusion restriction variables. We also check for multicollinearity and find that the highest VIF score is 4.33, which is less than the cutoff point of 10 ([Lennox et al.,](#)

2011). Results [available on request] are no different from those from OLS regression, suggested that the non-random sample selection issues is small, which corroborate with literature (Brown & Taylor, 2014; del Río & Young, 2006). Another way to estimate our model is to use tobit model which allow for the truncation of the dependent variables as Brown and Taylor (2014); Cox and Jappelli (1993). However, it would be unsuitable as the data are not censored or truncated, but defined on \mathbb{R}^+ (Maddala, 1991).

Therefore, we use, first, probit model with maximum likelihood estimation to estimate the probability for an individual of being in debt ($Indebt_i$) (eq. 1).

$$Indebt_i = \beta_0 + X'_i * \beta_1 + C'_{it} * \beta_2 + Z'_i * \beta_3 + \mu_i \quad (1)$$

Our control variables (C'_{it}) take the existing classic controls:

- Individual level variables as age; age square; sex; dummy variable which take 1 if individual is the household head, 0 otherwise; main occupation¹⁵; number of occupation (dummy variable which take 1 if individual declare more than one occupation, 0 otherwise); dummy variable which take 1 if individual received formal education through school, 0 otherwise (no formal education) and a dummy variable for marital status (1 if married, 0 otherwise).
- Household level variables as caste; monetary value of assets¹⁶; sex ratio; total annual income; household size; shock exposure (dummy variable which take 1 if the household experienced a shock¹⁷ between 2010 and 2016-17, 0 if not).

The amount of debt is estimated in $t+1$ and our independent variables in t , we therefore control for the indebtedness situation in t in adding dummy variable which take 1 if individual is indebted in 2016-17, 0 otherwise.

In order to investigate the amount of debt and the burden of repayment (Y_i), we use OLS (eq. 2). Despite the fact that DSR is a share, we do not use GLM because of the upper bound of the variable (> 1) (Cook, Kieschnick, & McCullough, 2008).

$$Y_i = \beta_0 + X'_i * \beta_1 + C'_{it} * \beta_2 + Z'_i * \beta_3 + \epsilon_i \quad (2)$$

To take into account the strength of social identity we investigate relationship on a pooled sample of egos with interactions variables to maximize statistical power, although splitting

¹⁵Define as the most time-consuming activity.

¹⁶The monetary value of assets includes gold; land; house; livestock; agricultural equipment and consumption good (car, computer, cookgas, phone, etc.).

¹⁷Marriage of at least one of the household members or/and household surveyed after the demonetisation.

samples improves model specification¹⁸. First we do not use interaction to see the global effect (1), then we add interaction variable with sex (2), caste (3) and both (4) to test whether the effect of PT&CS differ by sex and caste:

$$\begin{array}{ll} (1) & Z'_i = 0 \\ (2) & Z'_i = \text{Sex} * X'_i \end{array} \quad \begin{array}{ll} (3) & Z'_i = \text{Caste} * X'_i \\ (4) & Z'_i = \text{Sex} * \text{Caste} * X'_i \end{array}$$

We choose to cluster the error at households level to take into account the fact that observations within each household are not i.i.d. Indeed, we have data for two individuals from the same household and these latter sharing resources and pooling others. In terms of debt, as stated by Reboul et al. (2021), “our data is limited, [but] it suggests that fully pooling and sharing the household debt burden is not the norm.”

To interpret our results, we compute marginal effect (ME) at representative values on the predicted values of PT&CS. We use sex (male/female) and caste (non-dalits/dalits) as representative values, all other variables are at mean. Thanks to our interactions variables, we obtain nine groups of ME for each PT&CS variable: average individual; average male; average female; average non-dalits; average dalits; average non-dalits male; average dalits male; average non-dalits female and average dalits female.

We use Big-5 taxonomy as robustness check.

How the PT&CS varies across the indebtedness distribution? As OLS regression is mean reasoning, we supplement this analysis with quantile reasoning to understand the variation of PT&CS across the indebtedness distribution. Quantile debt regressions consider specific parts of the conditional distribution of the debt and indicate the influence of the PT&CS variables on conditional debt. Therefore, we estimate eq. 2 with quantile regression respectively at P10, P25, P50, P75 and P90 of the distribution. Controls variables remain the same and we also cluster the error at households level. To fully understand the results we do not use interaction variables ($Z'_i = 0$) and we compute ME at means to investigate the relationship between debt and PT&CS for the average individual at specific percentile of the distribution.

How PT&CS influences the debt trajectory? In a third step, we try to understand the debt trajectory through time. With a multinomial probit, we investigate the contribution of PT&CS on the debt trajectory: Never indebted in 2016-17 and 2020-21 (i); Out of debt between 2016-17 and 2020-21 (ii); Became indebted between 2016-17 and 2020-21 (iii); Always indebted in 2016-17 and 2020-21 (iv).

¹⁸The statistical power is not maximize if we use split samples.

$$Trajectory_i = \beta_0 + X'_i \beta_1 + C'_i \beta_2 + Z'_i * \beta_3 + \alpha_i \quad (3)$$

We use the same vector of control variables than for the two previous approach, we also cluster the error at households level and we compute ME at representative values (sex and caste at representative values). We also use Big-5 taxonomy as robustness check.

How does debt change over time as PT&CS changes? In a last step, we fully accept the non-stability of personality traits by using one-way¹⁹ individual fixed effect regressions (eq. 4) in order to compare within individual over time. In other words, as PT&CS increases for an individual over time, how does the debt change over time? Unlike the previous approach, we do not use personality traits from factor analysis insofar as factor for 2016-17 are different from those for 2020-21. The resulting factor from factor analysis of 2016-17 and 2020-21 are not interpreted in the same way, therefore, we cannot analyse the evolution of a given factor. While the way we compute Big-5 personality traits allow us to analyse evolution because we use the same method in 2016-17 and 2020-21. We use the same debt measures as before –the total amount of debt and the individual DSR– as endogenous variables (Y_i).

$$Y_{it} = X'_{it} \beta_1 + C'_{it} \beta_2 + Z'_{it} * \beta_3 + \alpha_i + u_{it} \quad (4)$$

We use the same vector of control variables than before. However, as we estimate FE model, time-invariant variables are omitted from the analysis: sex; education; caste. Cluster remains the same and ME at representative values (sex and caste) are computed.

An important caveat lies in the study of causality. We do not pretend to show a causal relationship between PT&CS and indebtedness but to relate correlations because we cannot rule out the possibility of reverse causality between PT&CS variation and indebtedness variation.

3 Descriptive statistics

3.1 Household unit in Table 1

Our final sample consists of 835 individuals from 473 households and almost half are dalits. Three quarters of households have 2 egos, the last quarters have only one egos –justifying the

¹⁹We choose to not compute two-way fixed effect for the many problems with maintaining assumptions and interpreting the coefficients (Imai & Kim, 2020; Kropko & Kubinec, 2020).

fact that we cluster the error at household level. The sex ratio is different through caste: in 24% of dalits households the sex ratio is equal to 1 which mean that they are as many men as women while in middle-upper caste, it is 34% of households in 2016-17. In terms of assets, middle-upper caste households are three times richer than dalits on average –respectively 1,493k INR and 487k INR in 2016-17. 50% of middle-upper caste have less than 666k INR of assets while 50% of dalits households have less than 266k INR in 2016-17. For 50% of dalits, the monetary value of assets increased by at least 47% between 2016-17 and 2020-21 while for 50% of non-dalits households, it decreased by at least 22%. However, middle and upper caste still have higher amount of assets in 2020-21. This economic advantage of non-dalit households is also found with income: the median income of middle-upper caste is 34% higher than dalits one in 2016-17 and 15% higher in 2020-21. Last, whatever the caste, we observe a reduction of total income: for 50% dalits households the total income decreased by at least 4% and for 50% of non-dalits households, it decreased by at least 5%.

3.2 Individual unit in Table 2

At egos level, 55% of our sample are male and among them, 46% are dalit (among female 50% are dalit). Male are, on average, older than female and three quarters of them are the head of household while female are only 9% in 2016-17 and 27% in 2020-21. This increase is partly due to the life cycle: when the household head died, is the wife who takes over as household head. In terms of education, male are more formal educated than female.

Disparities in terms of gender are also found in the occupation. Despite the increasing of the number of female in agriculture and the decreasing of the number of male in self-employment, this activities are mostly reserved for male. The reverse assessment is true for salaried job in agriculture: between 2016-17 and 2020-21 the share of male increase by 47% (from 16% to 24%) but female remain relatively more numerous (27.42% in 2016-17 and 29.58% in 2020-21). Whatever the gender, non-agricultural salaried job remain stable over time and the share of male implicated is similar to the share of female (around 37%). Non-income generating work as the main occupation is over-represented for female while even though the share fell considerably between 2016-17 and 2020-21 (from 24% to 15%). Moreover, female are more likely to have multiple occupations and this probability increase between 2016-17 and 2020-21 (from 50% to 60%). In terms of income, disparities persist between male and female. On average, male have 102,000 INR per year as labour income while female have 19,000 INR. Between 2016-17 and 2020-21, the average variation rate is higher for female than for male (respectively 173% and 163%).

Table 1: Household-unit descriptive statistics in 2016-17

	Dalits			Middle-upper		
	2016-17	2020-21	Δ	2016-17	2020-21	Δ
Number of households	n=228	n=228	n=228	n=245	n=245	n=245
Socio-demographic characteristics						
Household size (mean)	4.93	4.94		4.46	4.41	
Number of ego (%)						
1	24.12	24.12		22.86	22.86	
2	75.88	75.88		77.14	77.14	
Sex ratio (%)						
<i>More female</i>	32.02	32.46		26.12	27.76	
<i>Equal</i>	23.68	26.32		34.29	31.84	
<i>More male</i>	44.30	41.23		39.59	40.41	
Location (%)						
<i>Near Panruti</i>	74.56	74.56		57.55	57.55	
<i>Near Villupuram</i>	16.23	16.23		31.84	31.84	
<i>Near Tiruppur</i>	0.00	0.00		2.45	2.45	
<i>Near Chengalpattu</i>	6.14	6.14		6.53	6.53	
<i>Near Kanchipuram</i>	3.07	3.07		0.82	0.82	
<i>Near Chennai</i>	0.00	0.00		0.82	0.82	
Wealth & finance characteristics						
Assets* (1,000 INR)						
<i>Mean</i>	487.42	458.69	192.19	1,493.35	768.25	79.93
<i>SD</i>	846.30	353.32	522.68	2,373.47	1,263.68	317.01
<i>Median</i>	266.40	360.59	47.12	666.50	447.00	-22.45
Income [†] (1,000 INR)						
<i>Mean</i>	179.56	146.21	59.80	193.13	191.20	85.87
<i>SD</i>	332.51	160.91	182.79	206.40	244.79	303.90
<i>Median</i>	106.35	104.71	-3.55	142.20	120.04	-5.40
Shock (=1)	57.02	26.75		56.33	17.96	
Indebted household (=1)	99.12	99.12	-	98.78	97.96	-
Household debt path (%)						
<i>Never in debt</i>			0.00			0.00
<i>Out of debt</i>			0.75			1.61
<i>Becomes in debt</i>			1.00			0.92
<i>Always in debt</i>			98.25			97.47

Note: * desc of assets [†] desc of income

Source: NEEMESIS-1 (2016-17) & NEEMESIS-2 (2020-21); author's calculations.

Figure 2 shows the distribution of each PT&CS net of life-cycle standardised. Traits from Big-5 taxonomy (row 2) are not corrected from acquiescence bias. The distribution of personality traits from Big-5 taxonomy and factor analysis seems to corroborate. Indeed, in 2016-17, it appears that males tend to have higher scores for each traits: they are more open to experience, conscientious, extraverted, agreeable and emotionally stable. When we compare 2016-17 distribution with 2020-21 one, we observe that, males –taken as a whole– have slightly lower scores for openness to experience and extraversion while females have slightly higher ones. Distribution of conscientiousness is more platikurtic and shifted to the right in 2016-17 than in 2020-21 for males: taken as a whole, males are less conscientious in 2020-21 than in 2016-17. The assessment is reverse for females. Distributions of agreeableness of 2020-21 are more platikurtic for males and females: taken as a whole, a more important share of males/females is very/less agreeable in 2020-21 than in 2016-17. Conversely, distributions of 2020-21 for emotional stability are more leptokurtic for males and females. Concerning cognitive skills, distributions of RPM are more shifted to the left in 2016-17 than in 2020-21: taken as a whole, a more important share of males/females have a low score at RPM in 2020-21 than in 2016-17. For numeracy and literacy tests, distributions are more shifted to the right in 2016-17 than in 2020-21: taken as a whole, a more important share of males/females have a high score in 2020-21 than in 2016-17.

There are many disparities in terms of debt. While the share of individuals is relatively stable through time and gender (around 75%), the path is different. Females are more vulnerable than males in the sense that the share of individuals never in debt is lower for females than for males (respectively 10% and 14%) and the share of individuals becoming in debt between 2016-17 and 2020-21 is higher for females than for males (respectively 14% and 8%). To finish with the path, we observe that more than six out of ten individuals remain indebted. Our sample of indebted individuals consists of 643 individuals in 2016-17 and 606 individuals in 2020-21 whose 516 are indebted in 2016-17 and in 2020-21. Males have a higher absolute amount of debt than females (two times more in 2016-17: 190,000 INR for males while 80,000 INR for females) despite a reduction in the amount between 2016-17 and 2020-21 (for 50% of males, debt has decreased by more than 57%). On the other hand, 50% of females saw their debt increased by more than 24% (on average, in 2016-17 a female has a debt of 80,000 INR, while it is at 90,000 INR in 2020-21). Males spend less of their annual income on debt repayment than females: in 2016-17 50% of males spend 27% of their annual income on debt repayment and 12% in 2020-21 while females spend 32% in 2016-17 and 77% in 2020-21. Furthermore, 50% of males have seen their DSR decrease by at least 0.27% while 50% of females have seen their DSR increase by at least 0.09%.

Table 2: Individual-unit descriptive statistics in 2016-17

	Male			Female		
	2016-17	2020-21	Δ	2016-17	2020-21	Δ
Number of individuals	n=463	n=463	n=463	n=372	n=372	n=372
Socio-economic characteristics						
Caste (%)	46.22	46.22		50.27	50.27	
<i>Dalits</i>	53.78	53.78		49.73	49.73	
<i>Middle-upper caste</i>						
Age (mean)	44.46	48.46		40.33	44.33	
Head of family (=1)	75.38	74.08		9.14	27.15	
Married* (=1)	80.99	86.39		84.41	81.72	
School education (=1)	68.68	68.68		52.69	52.69	
Main occupation (%)						
<i>Agriculture</i>	17.06	16.20		3.49	11.74	
<i>Self-employed</i>	16.63	12.53		5.38	8.98	
<i>Salaried job (agri.)</i>	15.98	23.54		27.42	29.58	
<i>Salaried job (non-agri.)</i>	38.66	36.72		39.78	34.85	
<i>Unpaid working or not working</i>	11.66	11.02		23.92	14.85	
Multiple occupation (=1)	38.01	47.27		50.27	60.00	
Labour income (1,000 INR)						
<i>Mean</i>	102.42	74.63	162.78	19.29	21.71	173.02
<i>SD</i>	243.22	89.33	2,405.69	41.33	45.83	538.41
<i>Median</i>	56.00	51.67	-0.02	7.20	9.30	0.11
Debt characteristics						
In debt (=1)						
<i>Mean</i>	0.78	0.71	-	0.76	0.74	-
Individual debt path (%)						
<i>Never in debt</i>			14.04			9.95
<i>Out of debt</i>			14.69			15.86
<i>Became in debt</i>			8.42			13.71
<i>Always in debt</i>			62.85			60.48
Number of indebted individuals	n=359	n=330		n=284	n=276	
Loan amount (1,000 INR)						
<i>Mean</i>	189.74	136.87	2,067.62	79.52	90.38	126.21
<i>SD</i>	250.40	238.64	41,296.09	97.08	94.29	934.12
<i>Median</i>	105.00	64.58	-56.94	44.50	69.10	23.55
DSR (%)						
<i>Mean</i>	93.13	134.10	251.85	173.84	253.05	91.23
<i>SD</i>	417.16	558.99	1,580.94	411.71	554.54	575.37
<i>Median</i>	27.26	11.72	-0.27	31.59	77.30	0.09

Note: *Or not (unmarried, widowed, etc.).

Source: NEEMESIS-1 (2016-17) & NEEMESIS-2 (2020-21); author's calculations.

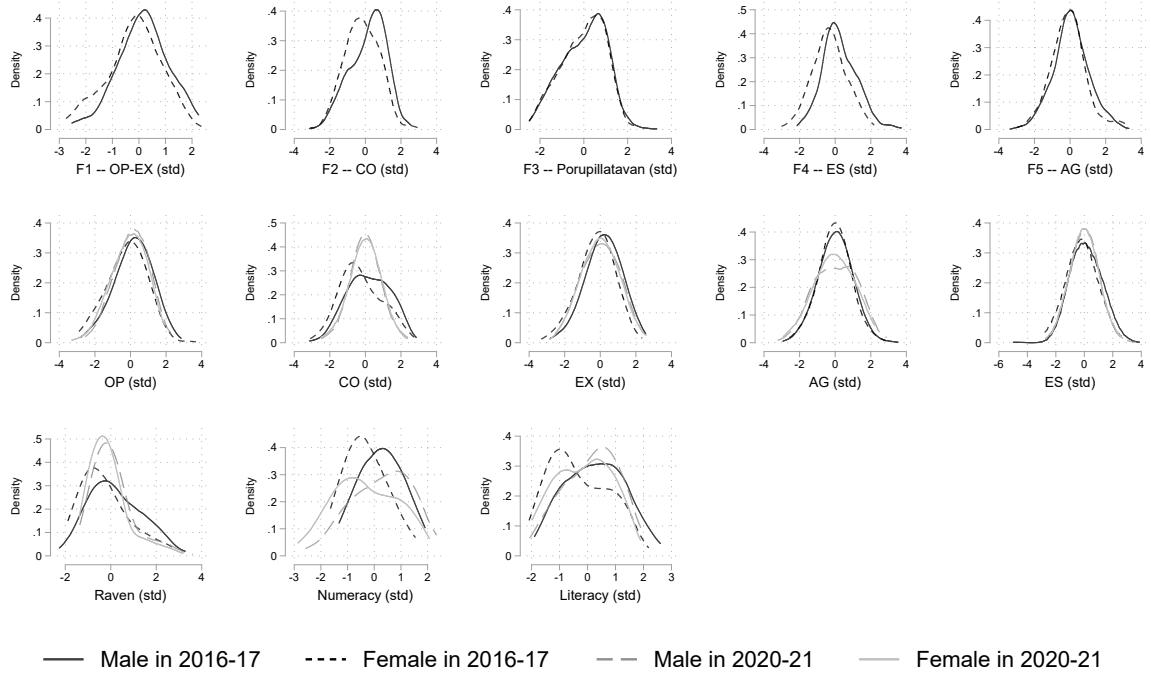


Figure 2: Distribution of PT&CS – The resulting PT&CS are based on the standardised residual from univariate OLS regression with age as exogenous variable. This is PT&CS purged from life-cycle effects.
Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21); author's calculations.

4 Results

To interpret the results, marginal effects (ME) at representative values on the predicted value of the PT&CS are reported for the four specifications as described previously. According to specifications, the representatives values are: (1) the average individual ("All"); (2) the average male ("Male") and the average female ("Female"); (3) the average non-dalits ("MUC") and the average dalits ("Dalits"); (4) the average non-dalits male ("MUC male"), the average dalits male ("Dalits male"), the average non-dalits female ("MUC female") and the average dalits female ("Dalits female"). All of PT&CS are standardised to ensure comparability between them. We will therefore speak in terms of "one standard deviation" more of PT&CS.

An important caveat to acknowledge prior to exposing the findings of our empirical analysis is the magnitude of the effects. They may seem high. However, this come from the low range of definitions of PT&CS variables. For personality traits, ranging around from -4 to 4, one more standard deviation represent a gap of 1/8. Put another way, for a variable ranging from -4 to 4, take an additional unit come back to take 12.5% in more.

4.1 How PT&CS shape individual debt?

Probability of being indebted Table 3 presents the results from the multivariate probit analysis of the probability for an individual to be indebtedness. McFadden's pseudo R^2 indicate a very good goodness-of-fit for all the specification –they are all above 0.2 threshold (McFadden, 1979). Moreover, we observe that all p-values associated with the simultaneous coefficient nullity test ($LR \chi^2$) are low enough to conclude that at least one of the regression coefficients in the model is not equal to zero.

The results show that 2016-17 cognitive skill –whatever the specification– are not correlated with the probability of being indebted in 2020-21 at 95% confidence level (neither at 90%), except for literacy which is positively correlated for the average female. However, three of the personality traits are correlated at the 90-95% confidence level. Without interaction variables, Factor 1 as OP-EX is negatively correlated with the probability for the average individual of being in debt. With gender interaction, the relationship becomes clearer for the average female and with caste interaction for the average non-dalits. With three way interaction variable, we observe that for the average non-dalits female, other things equal, when Factor 1 increase by one standard deviation, the probability of being in debt decrease by 11.1 pp. Factor 2 as CO and Factor 3 as Loquacious, are also negatively correlated for non-dalits female but less than Factor 1 (respectively 8.3 pp at 90% confidence level and 8.8 pp). literature. For Factor 2, the relationship is reverse for male and more precisely for non-dalits one: all else being equal, when Factor 2 increase by one standard deviation, the probability of being in debt increase by 9.3 pp.

Total amount of debt Table 8 presents the results from the multivariate OLS analysis of the first outcome of the burden of debt, the total loan amount. All p-values associated with the simultaneous coefficient nullity test (F-stat) are low enough to conclude that at least one of the regression coefficients in the model is not equal to zero. The goodness-of-fit is less good than the previous one: we are able to explain around 23% of the total variance of the total amount of debt.

Numeracy and Raven are correlated with the total amount of debt at 95% confidence level for dalits female, but the relationship is reverse (negative relationship for Numeracy while positive relationship for Raven). In addition, Raven is negatively correlated for non-dalits female at 95% confidence level, and the relationship is more stronger than for dalits female (respectively +23,315 ₹ and -44,021 ₹). Regarding personality traits, Factor 2 and Factor 3 are negatively correlated with the total amount of debt when there is not interactions variables. The relationship becomes clearer at 90% confidence level for male, non-dalits and *in fine* for

Table 3: ME on the probability of being in debt in 2020-21 estimated with probit model.

	(1)	(2)		(3)		(4)			
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
F1 - OP-EX (std)	-0.033 (-1.852)	-0.011 (-0.401)	-0.046 (-1.793)	-0.083 (-3.050)	0.001 (0.061)	-0.058 (-1.509)	0.013 (0.318)	-0.110 (-2.366)	-0.000 (-0.017)
F2 - CO (std)	0.003 (0.176)	0.039 (1.467)	-0.042 (-1.516)	0.021 (0.827)	-0.009 (-0.396)	0.085 (2.144)	-0.002 (-0.057)	-0.077 (-1.713)	-0.014 (-0.416)
F3 - Porupillatavan (std)	-0.017 (-0.970)	-0.007 (-0.265)	-0.031 (-1.213)	-0.041 (-1.609)	-0.003 (-0.108)	-0.026 (-0.704)	-0.010 (-0.255)	-0.084 (-2.023)	0.010 (0.306)
F4 - ES (std)	0.001 (0.054)	0.016 (0.613)	-0.016 (-0.609)	-0.028 (-1.092)	0.015 (0.681)	-0.044 (-1.135)	0.062 (1.649)	-0.047 (-1.019)	-0.023 (-0.774)
F5 - AG (std)	-0.027 (-1.514)	-0.038 (-1.449)	-0.029 (-1.091)	-0.048 (-1.719)	-0.017 (-0.720)	-0.067 (-1.703)	-0.026 (-0.714)	-0.056 (-1.238)	-0.025 (-0.800)
Literacy (std)	0.032 (1.134)	0.012 (0.302)	0.067 (1.768)	0.050 (1.391)	0.012 (0.340)	0.061 (1.181)	-0.029 (-0.503)	0.070 (1.277)	0.073 (1.573)
Numeracy (std)	-0.005 (-0.217)	0.004 (0.118)	-0.030 (-0.801)	-0.008 (-0.230)	-0.002 (-0.064)	-0.048 (-0.926)	0.047 (0.860)	-0.003 (-0.056)	-0.048 (-1.013)
Raven (std)	0.002 (0.081)	0.024 (0.801)	-0.027 (-0.880)	-0.017 (-0.612)	0.023 (0.734)	0.016 (0.384)	0.044 (0.958)	-0.053 (-1.206)	-0.003 (-0.091)
Individuals controls	X		X		X			X	
Households controls	X		X		X			X	
Villages FE	X		X		X			X	
Observations	831		831		831			831	
McFadden's pseudo R ²	0.201		0.213		0.210			0.231	
Log-likelihood	-390.009		-384.098		-385.896			-375.258	
LR χ ²	222.507		223.870		278.651			256.036	
p-value	0.000		0.000		0.000			0.000	

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

non-dalits male with a stronger relationship for Factor 2: all else being equal, when Factor 2 increase by one standard deviation, predicted total loan amount decrease by 49,000 ₹ (37,000 ₹ for Factor 3). Factor 2 and Factor 3 are also negatively correlated at 90% confidence level for respectively dalits female and non-dalits female. Among dalits female, those with higher Factor 5 as AG are also those with lower amount of debt, other things equal. Last, Factor 1 is positively correlated when there is not interactions variables and the relationship seems to be clarified for middle-upper caste individual and more for middle-upper caste male at 90% confidence level(40,167 ₹ of debt in more).

Individual debt service ratio Table 9 presents the results for the individual debt service ratio. All p-values associated with the simultaneous coefficient nullity test (F-stat) are low enough and the goodness-of-fit is quite low compared to previous analysis.

As for the previous analysis, Factor 1 is positively correlated with the share of the annual income dedicated to debt (capital and interest) repayment and especially for dalits female at 95% confidence level. Indeed, for the average individuals, when Factor 1 increase by one standard deviation , the predicted debt service ratio increase by 94 pp, all else being equal. Factor 2 is negatively correlated and mainly for female at 90% confidence level. Magnitude of the correlation is similar to that of Factor 1 for the average female (83 pp in more for Factor 1 and 84 pp in less for Factor 2, other things equal). Factor 4 as ES and Factor 3 are also correlated

Table 4: ME on the total loan amount in 2020-21 estimated with OLS model.

	(1)	(2)		(3)		(4)			
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
F1 - OP-EX (std)	15.318 (2.198)	17.837 (1.465)	10.711 (1.630)	32.476 (2.472)	1.624 (0.263)	49.398 (2.274)	-7.141 (-0.574)	12.129 (1.030)	12.614 (1.894)
F2 - CO (std)	-18.771 (-1.824)	-31.262 (-1.838)	-4.612 (-0.591)	-35.496 (-1.864)	-8.130 (-0.807)	-64.126 (-2.164)	-9.394 (-0.481)	-2.173 (-0.134)	-9.313 (-1.570)
F3 - Porupillatavan (std)	-19.248 (-1.959)	-23.766 (-1.721)	-11.718 (-1.327)	-29.307 (-1.925)	-6.200 (-0.804)	-32.836 (-1.654)	-6.211 (-0.452)	-18.434 (-1.167)	-6.812 (-1.080)
F4 - ES (std)	-0.611 (-0.050)	0.058 (0.002)	-4.542 (-0.567)	17.257 (0.634)	-13.286 (-1.498)	37.151 (0.764)	-17.161 (-1.074)	-15.761 (-1.059)	-5.079 (-0.723)
F5 - AG (std)	-3.615 (-0.474)	-1.052 (-0.087)	-11.334 (-1.771)	11.242 (0.670)	-13.009 (-2.234)	13.254 (0.532)	-9.115 (-1.058)	-13.699 (-1.073)	-14.799 (-2.436)
Literacy (std)	5.505 (0.378)	13.513 (0.707)	-5.019 (-0.388)	5.023 (0.246)	13.271 (0.947)	2.930 (0.110)	18.388 (0.873)	-1.028 (-0.051)	3.684 (0.335)
Numeracy (std)	7.721 (0.802)	11.771 (0.778)	2.100 (0.152)	28.575 (1.556)	-8.508 (-0.953)	26.918 (0.929)	3.459 (0.234)	23.660 (1.068)	-16.307 (-1.708)
Raven (std)	1.395 (0.158)	9.731 (0.702)	-6.226 (-0.559)	-4.646 (-0.338)	4.124 (0.431)	16.080 (0.829)	-7.236 (-0.405)	-33.094 (-1.722)	21.037 (2.228)
Individuals controls	X	X	X					X	
Households controls	X	X	X					X	
Villages FE	X	X	X					X	
Observations	603	603	603					603	
R ²	0.263	0.273	0.288					0.315	
Adjusted R ²	0.221	0.221	0.237					0.244	
F-stat	5.404	3.244	3.768					2.453	
p-value	0.000	0.000	0.000					0.000	

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

with the individual debt service ratio for non-dalits female at 90% confidence level and with the same strength (around 123 pp) but relationship is reversed (positively correlated for Factor 3 and negatively correlated for Factor 4).

Specifically, a one standard deviation increase in EX is associated with a decrease in the ... by 1.87 percentage points.

4.2 How PT&CS varies across the indebtedness distribution?

4.3 How PT&CS influences the debt trajectory?

4.4 How does debt change over time as PT&CS changes?

Table 5: ME on the individual DSR in 2020-21 estimated with OLS model.

	(1)	(2)		(3)		(4)			
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
F1 - OP-EX (std)	48.913 (2.159)	20.582 (0.618)	84.983 (3.173)	51.701 (1.455)	40.869 (1.345)	59.210 (0.995)	-18.275 (-0.380)	42.954 (1.170)	98.665 (2.394)
F2 - CO (std)	-47.523 (-1.962)	-5.563 (-0.255)	-84.256 (-1.748)	-41.911 (-1.375)	-46.934 (-1.262)	-17.303 (-0.538)	6.612 (0.235)	-38.967 (-0.759)	-105.180 (-1.473)
F3 - Porupillatavan (std)	4.462 (0.185)	-14.441 (-0.394)	29.597 (0.888)	4.156 (0.122)	-0.974 (-0.032)	-37.428 (-0.739)	16.242 (0.332)	92.975 (1.757)	-19.390 (-0.496)
F4 - ES (std)	-26.711 (-1.062)	-12.385 (-0.516)	-50.703 (-1.181)	-66.391 (-1.506)	1.149 (0.041)	2.064 (0.051)	-18.703 (-0.593)	-135.612 (-1.840)	22.110 (0.532)
F5 - AG (std)	11.609 (0.565)	18.585 (0.768)	2.674 (0.066)	-7.403 (-0.262)	25.841 (0.884)	19.159 (0.547)	20.267 (0.617)	-64.067 (-1.279)	46.577 (0.897)
Literacy (std)	2.955 (0.099)	-12.258 (-0.320)	18.860 (0.456)	-11.199 (-0.277)	12.808 (0.317)	-1.014 (-0.018)	-39.576 (-0.839)	-58.073 (-0.937)	51.699 (0.932)
Numeracy (std)	-11.547 (-0.428)	-30.770 (-0.992)	14.870 (0.283)	-1.534 (-0.038)	-21.369 (-0.615)	-33.476 (-0.819)	-22.285 (-0.496)	41.119 (0.488)	-5.524 (-0.104)
Raven (std)	20.849 (0.806)	-22.947 (-0.930)	65.259 (1.199)	24.449 (0.665)	13.456 (0.339)	-32.798 (-1.250)	-12.279 (-0.277)	109.081 (1.288)	36.037 (0.503)
Individuals controls	X		X		X			X	
Households controls	X		X		X			X	
Villages FE	X		X		X			X	
Observations	603		603		603			603	
R ²	0.069		0.088		0.072			0.105	
Adjusted R ²	0.016		0.023		0.006			0.011	
F-stat	2.488		1.677		1.902			1.602	
p-value	0.000		0.007		0.001			0.005	

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

Table 6: ME on the total loan amount and individual DSR in 2020-21 estimated with quantile regression.

	Total loan amount					DSR				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)	ME/(t-stat)
F1 - OP-EX (std)	P10 (0.478)	P25 (0.187)	P50 (1.230)	P75 (1.419)	P90 (0.861)	P10 (-0.017)	P25 (0.730)	P50 (0.264)	P75 (1.811)	P90 (2.834)
F2 - CO (std)	1.115 (0.390)	-0.738 (-0.209)	0.147 (0.030)	-2.144 (-0.328)	-7.742 (-0.590)	0.460 (0.393)	0.365 (0.262)	-1.753 (-0.572)	-14.367 (-0.910)	-43.609 (-1.273)
F3 - Porupillatavan (std)	0.704 (0.271)	1.601 (0.494)	2.165 (0.594)	2.393 (0.424)	-12.669 (-1.335)	0.095 (0.085)	-0.228 (-0.169)	3.661 (1.337)	-0.028 (-0.002)	33.253 (1.436)
F4 - ES (std)	1.388 (0.512)	0.234 (0.071)	-9.344 (-2.182)	-12.602 (-1.400)	-11.444 (-0.968)	0.275 (0.230)	1.452 (0.873)	-0.065 (-0.023)	0.113 (0.010)	-63.408 (-1.670)
F5 - AG (std)	-1.154 (-0.493)	-2.397 (-0.877)	-5.563 (-1.235)	-6.083 (-0.990)	-8.866 (-1.252)	0.508 (0.454)	0.460 (0.354)	1.411 (0.477)	0.632 (0.043)	-22.031 (-0.899)
Literacy (std)	-0.149 (-0.042)	9.368 (2.311)	10.291 (1.453)	-4.895 (-0.516)	-33.032 (-1.643)	0.654 (0.378)	2.027 (0.826)	1.414 (0.295)	-7.251 (-0.350)	-13.160 (-0.374)
Numeracy (std)	-3.222 (-0.894)	-7.085 (-1.763)	-4.376 (-0.652)	3.938 (0.457)	34.167 (1.820)	-0.627 (-0.402)	-2.785 (-1.370)	0.323 (0.088)	-3.586 (-0.301)	20.121 (0.694)
Raven (std)	0.454 (0.145)	-2.093 (-0.506)	-2.327 (-0.454)	2.341 (0.317)	5.441 (0.315)	-0.396 (-0.310)	-1.758 (-1.022)	-1.419 (-0.456)	3.984 (0.366)	44.256 (1.153)
Observations	603	603	603	603	603	603	603	603	603	603
$\sum Deviation $	6,496	14,775	24,052	25,056	17,953	11,377	27,855	52,392	68,286	62,768
$\sum Deviation$	6,738	15,623	26,007	29,240	24,383	11,406	28,315	54,656	73,900	71,046
R ²	0.103	0.109	0.188	0.227	0.227	0.008	0.017	0.023	0.028	0.036

Note: Marginal effects at the mean are reported and T-stat are in parentheses.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

Table 7: ME on the individual debt trajectory between 2016-17 and 2020-21 estimated with multinomial probit.

	(1)	(2)	(3)		(4)				
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
Never in debt									
F1 - OP-EX (std)	-0.006 (-0.978)	-0.025 (-1.238)	-0.002 (-0.469)	-0.004 (-0.434)	-0.007 (-0.897)	-0.019 (-0.882)	-0.024 (-1.031)	-0.001 (-0.167)	-0.002 (-0.841)
F2 - CO (std)	-0.000 (-0.046)	-0.022 (-1.358)	0.007 (1.351)	-0.003 (-0.342)	0.002 (0.313)	-0.003 (-0.208)	-0.029 (-1.331)	0.002 (0.263)	0.007 (1.451)
F3 - Porupillatavan (std)	0.012 (1.773)	0.001 (0.076)	0.013 (2.061)	0.027 (2.468)	0.002 (0.271)	0.015 (1.035)	-0.004 (-0.231)	0.027 (1.891)	0.002 (1.109)
F4 - ES (std)	-0.002 (-0.355)	-0.012 (-0.737)	-0.001 (-0.140)	0.015 (1.520)	-0.011 (-1.421)	0.018 (1.421)	-0.031 (-1.327)	0.007 (0.740)	-0.003 (-1.267)
F5 - AG (std)	0.003 (0.447)	0.014 (1.061)	-0.000 (-0.034)	0.007 (0.799)	0.002 (0.352)	0.024 (1.445)	0.007 (0.478)	-0.002 (-0.294)	-0.001 (-0.275)
Literacy (std)	-0.020 (-1.636)	-0.023 (-0.807)	-0.012 (-1.550)	-0.033 (-1.884)	-0.010 (-0.843)	-0.004 (-0.209)	-0.022 (-0.675)	-0.025 (-1.547)	0.001 (0.175)
Numeracy (std)	0.007 (0.860)	-0.001 (-0.048)	0.009 (1.171)	0.007 (0.527)	0.007 (0.761)	-0.003 (-0.177)	-0.002 (-0.077)	0.013 (0.968)	0.001 (0.362)
Raven (std)	-0.001 (-0.160)	0.007 (0.491)	-0.004 (-0.882)	0.011 (1.185)	-0.011 (-1.288)	0.006 (0.547)	0.005 (0.216)	0.006 (0.629)	-0.008 (-1.665)
Out of debt									
F1 - OP-EX (std)	0.035 (2.128)	0.019 (0.807)	0.054 (1.994)	0.078 (3.176)	0.001 (0.024)	0.061 (1.844)	-0.003 (-0.079)	0.114 (2.394)	-0.001 (-0.019)
F2 - CO (std)	-0.004 (-0.225)	-0.023 (-1.076)	0.030 (1.069)	-0.020 (-0.866)	0.007 (0.347)	-0.078 (-2.352)	0.025 (0.834)	0.070 (1.600)	-0.013 (-0.361)
F3 - Porupillatavan (std)	0.008 (0.552)	0.004 (0.186)	0.022 (0.843)	0.010 (0.444)	0.009 (0.400)	0.003 (0.095)	0.019 (0.599)	0.035 (0.961)	-0.013 (-0.378)
F4 - ES (std)	0.002 (0.154)	-0.008 (-0.393)	0.021 (0.766)	0.004 (0.177)	0.005 (0.265)	0.019 (0.581)	-0.026 (-0.926)	0.020 (0.433)	0.046 (1.354)
F5 - AG (std)	0.023 (1.459)	0.020 (0.970)	0.040 (1.432)	0.031 (1.346)	0.020 (0.941)	0.030 (0.996)	0.025 (0.816)	0.059 (1.306)	0.040 (1.186)
Literacy (std)	-0.004 (-0.181)	0.011 (0.375)	-0.039 (-0.970)	-0.015 (-0.511)	0.007 (0.223)	-0.046 (-1.187)	0.063 (1.334)	-0.012 (-0.220)	-0.077 (-1.444)
Numeracy (std)	-0.004 (-0.184)	-0.007 (-0.246)	0.022 (0.587)	0.003 (0.107)	-0.011 (-0.340)	0.047 (1.145)	-0.053 (-1.142)	-0.003 (-0.060)	0.040 (0.752)
Raven (std)	0.002 (0.135)	-0.019 (-0.788)	0.028 (0.881)	0.007 (0.294)	-0.006 (-0.224)	-0.010 (-0.291)	-0.047 (-1.236)	0.016 (0.372)	0.039 (0.943)
Becomes in debt									
F1 - OP-EX (std)	0.001 (0.110)	0.018 (0.924)	-0.010 (-0.637)	0.019 (1.089)	-0.017 (-0.865)	0.029 (1.313)	0.014 (0.440)	0.021 (0.865)	-0.049 (-2.375)
F2 - CO (std)	0.001 (0.094)	-0.000 (-0.006)	0.004 (0.216)	-0.015 (-0.842)	0.017 (0.819)	0.002 (0.138)	0.007 (0.231)	-0.023 (-0.847)	0.024 (1.047)
F3 - Porupillatavan (std)	0.031 (2.280)	0.004 (0.204)	0.052 (2.486)	0.012 (0.707)	0.053 (2.315)	0.022 (1.419)	-0.006 (-0.159)	0.014 (0.511)	0.091 (2.975)
F4 - ES (std)	0.019 (1.490)	0.027 (1.567)	0.010 (0.576)	0.005 (0.321)	0.030 (1.619)	0.025 (1.422)	0.030 (1.071)	-0.006 (-0.224)	0.020 (0.924)
F5 - AG (std)	-0.012 (-0.911)	-0.034 (-1.864)	-0.001 (-0.057)	-0.008 (-0.464)	-0.015 (-0.812)	0.002 (0.081)	-0.067 (-2.282)	-0.016 (-0.565)	0.018 (0.917)
Literacy (std)	-0.005 (-0.276)	0.002 (0.064)	-0.008 (-0.358)	-0.017 (-0.723)	0.010 (0.313)	-0.005 (-0.180)	0.014 (0.293)	-0.007 (-0.216)	0.003 (0.102)
Numeracy (std)	0.008 (0.399)	-0.008 (-0.261)	0.026 (1.067)	0.005 (0.219)	0.013 (0.423)	-0.035 (-1.470)	0.018 (0.401)	0.039 (1.109)	0.023 (0.686)
Raven (std)	-0.007 (-0.427)	0.030 (1.408)	-0.044 (-2.145)	-0.018 (-0.967)	-0.001 (-0.045)	0.017 (0.861)	0.044 (1.153)	-0.056 (-1.884)	-0.045 (-1.738)
Always in debt									
F1 - OP-EX (std)	-0.030 (-1.621)	-0.012 (-0.409)	-0.042 (-1.490)	-0.093 (-3.357)	0.023 (0.915)	-0.071 (-1.796)	0.013 (0.308)	-0.134 (-2.835)	0.052 (1.533)
F2 - CO (std)	0.003 (0.130)	0.045 (1.532)	-0.041 (-1.276)	0.038 (1.338)	-0.027 (-1.004)	0.079 (2.040)	-0.003 (-0.075)	-0.049 (-0.971)	-0.018 (-0.451)
F3 - Porupillatavan (std)	-0.052 (-2.681)	-0.009 (-0.318)	-0.087 (-2.865)	-0.048 (-1.723)	-0.063 (-2.317)	-0.040 (-1.088)	-0.009 (-0.212)	-0.076 (-1.723)	-0.080 (-1.857)
F4 - ES (std)	-0.019 (-0.994)	-0.007 (-0.245)	-0.030 (-1.001)	-0.025 (-0.870)	-0.023 (-0.923)	-0.063 (-1.651)	0.028 (0.694)	-0.022 (-0.468)	-0.062 (-1.561)
F5 - AG (std)	-0.014 (-0.725)	0.000 (0.007)	-0.039 (-1.284)	-0.029 (-1.053)	-0.007 (-0.275)	-0.056 (-1.468)	0.035 (0.945)	-0.041 (-0.894)	-0.057 (-1.467)
Literacy (std)	0.030 (0.963)	0.009 (0.215)	0.059 (1.385)	0.065 (1.674)	-0.007 (-0.170)	0.056 (1.095)	-0.055 (-0.873)	0.044 (0.759)	0.074 (1.260)
Numeracy (std)	-0.011 (-0.404)	0.016 (0.395)	-0.057 (-1.362)	-0.016 (-0.407)	-0.010 (-0.244)	-0.009 (-0.189)	0.036 (0.611)	-0.048 (-0.854)	-0.064 (-1.109)
Raven (std)	0.005 (0.229)	-0.018 (-0.559)	0.020 (0.589)	0.000 (0.001)	0.019 (0.506)	-0.014 (-0.345)	-0.001 (-0.027)	0.035 (0.760)	0.014 (0.278)
Individuals controls	X	X	X	X	X	X	X	X	X
Households controls	X	X	X	X	X	X	X	X	X
Villages FE	X	X	X	X	X	X	X	X	X
Observations	831	831	831	831	831	831	831	831	831
Log-likelihood	-686.423	-671.020	-673.434	-673.434	-673.434	-673.434	-673.434	-673.434	-673.434
LR χ^2	362.307	399.753	435.654	435.654	435.654	435.654	435.654	435.654	435.654
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMSIS-1 (2016-17) and NEEMSIS-2 (2020-21); author's calculations.

Table 8: ME of the total loan amount estimated with FE model.

	(1)	(2)		(3)		(4)			
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
OP (std)	7.531 (0.788)	-0.103 (-0.006)	12.626 (1.587)	4.922 (0.281)	10.066 (1.444)	-15.776 (-0.544)	14.943 (1.387)	29.130 (1.942)	2.010 (0.260)
CO (std)	4.080 (0.474)	-1.486 (-0.096)	7.937 (1.330)	9.710 (0.618)	-3.704 (-0.438)	13.881 (0.521)	-24.405 (-1.409)	1.194 (0.109)	11.898 (1.738)
EX (std)	-13.986 (-1.415)	-19.612 (-1.290)	-10.560 (-1.242)	-3.911 (-0.239)	-23.865 (-2.251)	-3.665 (-0.148)	-41.023 (-2.287)	-14.921 (-1.079)	-7.762 (-0.844)
AG (std)	10.544 (1.077)	26.184 (1.548)	-2.859 (-0.370)	0.014 (0.001)	23.136 (1.439)	13.463 (0.711)	47.577 (1.688)	-3.564 (-0.318)	0.424 (0.044)
ES (std)	-14.046 (-1.112)	-22.884 (-1.180)	-3.961 (-0.479)	-32.965 (-1.413)	4.679 (0.418)	-54.071 (-1.606)	9.896 (0.589)	-3.413 (-0.224)	-2.784 (-0.352)
Literacy (std)	29.904 (2.687)	49.702 (2.612)	7.042 (0.992)	46.941 (2.520)	6.881 (0.836)	80.508 (2.733)	6.525 (0.494)	2.538 (0.231)	11.060 (1.170)
Numeracy (std)	-4.461 (-0.714)	-6.009 (-0.549)	-3.319 (-0.564)	-14.355 (-1.274)	6.818 (1.150)	-16.784 (-0.910)	10.610 (1.011)	-10.572 (-0.923)	1.424 (0.238)
Raven (std)	-12.439 (-1.267)	-30.186 (-1.965)	11.798 (1.735)	-15.840 (-0.906)	-5.620 (-0.718)	-37.165 (-1.510)	-17.233 (-1.227)	18.742 (1.538)	7.819 (1.189)
Individuals controls	X		X		X			X	
Households controls	X		X		X			X	
Individuals FE	X		X		X			X	
Observations	1,244		1,244		1,244			1,244	
Nb of groups	733		733		733			733	
ρ	0.551		0.561		0.555			0.562	
Within R^2	0.080		0.103		0.099			0.139	
Between R^2	0.000		0.000		0.000			0.000	
Overall R^2	0.003		0.005		0.005			0.010	
F-stat	1.965		2.114		1.713			1.749	
p-value	0.006		0.001		0.012			0.002	

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

Table 9: ME on the individual DSR estimated with FE model.

	(1)	(2)		(3)		(4)			
	ME/(t-stat) All	ME/(t-stat) Male	ME/(t-stat) Female	ME/(t-stat) MUC	ME/(t-stat) Dalits	ME/(t-stat) MUC male	ME/(t-stat) Dalits male	ME/(t-stat) MUC female	ME/(t-stat) Dalits female
OP (std)	-11.000 (-0.627)	-12.594 (-0.481)	3.928 (0.131)	-6.345 (-0.258)	-14.730 (-0.574)	3.174 (0.075)	-36.523 (-1.586)	-8.210 (-0.209)	9.023 (0.206)
CO (std)	-7.007 (-0.377)	13.359 (0.908)	-25.455 (-0.694)	7.997 (0.313)	-25.820 (-1.022)	19.640 (1.098)	-8.446 (-0.441)	-8.159 (-0.146)	-24.159 (-0.555)
EX (std)	-2.559 (-0.137)	33.368 (1.701)	-48.177 (-1.269)	27.708 (1.170)	-39.865 (-1.374)	48.059 (1.378)	13.917 (0.838)	4.890 (0.116)	-108.832 (-1.831)
AG (std)	5.606 (0.235)	-17.138 (-0.627)	28.034 (0.674)	-22.069 (-0.733)	43.159 (1.365)	-37.660 (-0.948)	22.375 (1.225)	-6.366 (-0.125)	70.979 (1.007)
ES (std)	0.393 (0.020)	-25.307 (-1.357)	33.281 (0.819)	-17.244 (-0.744)	22.966 (0.774)	-39.750 (-1.183)	-3.771 (-0.308)	12.427 (0.345)	54.775 (0.841)
Literacy (std)	15.382 (0.808)	28.326 (1.211)	3.531 (0.088)	14.664 (0.673)	19.974 (0.588)	40.489 (1.174)	8.028 (0.396)	-20.395 (-0.395)	37.244 (0.627)
Numeracy (std)	24.822 (1.538)	7.956 (0.794)	53.359 (1.513)	24.829 (1.422)	26.477 (0.966)	19.403 (1.036)	-12.149 (-0.997)	38.496 (1.137)	60.912 (1.192)
Raven (std)	20.502 (1.040)	-5.422 (-0.615)	56.412 (1.183)	-4.740 (-0.225)	45.227 (1.307)	-12.446 (-0.886)	-0.930 (-0.074)	6.877 (0.130)	93.605 (1.302)
Individuals controls	X		X		X			X	
Households controls	X		X		X			X	
Individuals FE	X		X		X			X	
Observations	1,244		1,244		1,244			1,244	
Nb of groups	733		733		733			733	
ρ	0.561		0.570		0.557			0.564	
Within R^2	0.062		0.084		0.077			0.106	
Between R^2	0.007		0.009		0.007			0.09	
Overall R^2	0.009		0.012		0.013			0.018	
F-stat	1.077		0.967		0.968			0.904	
p-value	0.369		0.519		0.518			0.654	

Note: Marginal effects at representative values are reported and T-stat are in parentheses. Column 1 correspond at the average individual, column 2 at the average male, column 3 at the average female, column 4 at the average non-dalit, column 5 at the average dalit, column 6 at the average non-dalit male, column 7 at the average dalit male, column 8 at the average non-dalit female and column 9 at the average dalit female.

Source: NEEMESIS-1 (2016-17) and NEEMESIS-2 (2020-21); author's calculations.

5 Discussion and conclusion

As argued in the introduction, the quantification of the role of PT&CS remains a blind spot of current debates about indebtedness.

This paper reveal a number of important insights. Personality traits and cognitive skills are correlated with the probability of being in debt, the amount of debt and the burden of debt in rural India at different magnitude according to caste and sex.

PT&CS and debt in the literature Studies in northern countries reveal that emotional stability is a positive predictor of debt ([Nyhus & Webley, 2001](#)). Our results seems to highlight reverse relationship with individual debt service ratio in rural India for non-dalits female ([Brown & Taylor, 2014](#) find also relationship between neuroticism and debt for female). For others groups, whatever the approach, we do not find significant relationship suggesting that this personality trait is not important in influencing level of debt, all else being equal. For non-dalits female given that emotional stability is related to pessimism, the finding that it has a negative association with individual debt is interesting in the context of the positive association found in the existing literature relating to financial optimism and debt. Indeed, **lit.**

Concerning openness and extraversion, [Brown and Taylor \(2014\)](#) find positive relationship with the probability of holding debt while our results suggest negative relationship for non-dalits female. In terms of level of debt, we find that openness and extraversion are positively correlated with future debt which corroborate with [Brown and Taylor \(2014\)](#). When we interesting in the PT&CS variation on indebtedness variation, it appear that openness is positively correlated with the loan amount while extraversion is negatively correlated. **Why?**

Our findings on level of debt and burden of debt corroborate with [Brown and Taylor \(2014\)](#); [Donnelly, Iyer, and Howell \(2012\)](#) who find that conscientiousness is inversely associated with the level of unsecured debt: individuals who are more conscientious are more able to “manage their money through greater levels of financial self-control.” Nevertheless, our results for non-dalits male are reverse to [Brown and Taylor \(2014\)](#); [Nyhus and Webley \(2001\)](#), who find that conscientious individuals are less likely to have ever been in debt. **Why?**

[Brown and Taylor \(2014\)](#)

- Small magnitude
- For the probability of holding debt, CO inversely associated, les 4 autres positively
- For relationship between finance and PT&CS accross debt distribution: in general there

was no differential impact from personality traits on finances across the income distribution, the only exceptions being in the case of extraversion and neuroticism.

- for gender : All other gender interactions with each personality trait are statistically insignificant.

[Donnelly et al. \(2012\)](#)

- For the probability of holding debt, CO inversely associated

[Forlicz and Rólczyński \(2019\)](#)

-

[Bertaut and Starr \(2002\)](#)

-

Literature on individual debt practices

PT&CS and other outcomes in rural India

Conclusion As [Brown and Taylor \(2014\)](#) on montre l'importance des PT&CS dans l'analyse des finances

Numerous study reveal the gravity of the burden of debt for female and dalits, with double-jeopardy phenomenon. Here we highlight the fact that in this social identity, there is considerable differences.

6 Conclusion

Malgré un double jeopardy avéré pour les dalits female, some tend to differentiate themselves with PT&CS . Les programmes de MC qui essayent de cibler les plus pauvres ne sont pas super efficient car même chez eux, il y a beaucoup de situation différentes en termes de dette. Pose la question de l'inclusion financière

References

- Agarwal, S., & Mazumder, B. (2013, jan). Cognitive abilities and household financial decision making. *American Economic Journal: Applied Economics*, 5(1), 193–207. Retrieved from <https://www.aeaweb.org/articles?id=10.1257/app.5.1.193> doi: 10.1257/app.5.1.193
- Allport, G. W. (1961). *Pattern and growth in personality*. Holt, Reinhart and Winston.
- Almlund, M., Duckworth, A. L., Heckman, J. J., & Kautz, T. D. (2011). Personality Psychology and Economics. In E. Hanushek, S. Machin, & L. Woessman (Eds.), *Handbook of the Economics of Education* (Vol. 4, pp. 1–181). Amsterdam: Elsevier. Retrieved from <https://doi.org/10.1016/B978-0-444-53444-6.00001-8> doi: 10.1016/B978-0-444-53444-6.00001-8
- Alvi, M. F., Ward, P., Makija, S., & Spielman, D. J. (2019, August). *Does identity affect aspirations in rural India? An examination from the Lens of Caste and Gender* (Discussion Paper No. 01857). Washington DC, USA: IFRPI.
- Ardelt, M. (2000, dec). Still Stable after All These Years? Personality Stability Theory Revisited. *Social Psychology Quarterly*, 63(4), 392. Retrieved from <https://doi.org/10.2307/2695848> doi: 10.2307/2695848
- Bertaut, C. C., & Starr, M. (2002). Household portfolios in the united states. In L. Guiso, M. Haliassos, & T. Jappelli (Eds.), *Household portfolios* (chap. 5). The MIT Press. Retrieved from <https://doi.org/10.7551/mitpress/3568.003.0010> doi: 10.7551/mitpress/3568.003.0010
- Betti, G., Dourmashkin, N., Rossi, M., & Yin, Y. P. (2007, may). Consumer over-indebtedness in the EU: measurement and characteristics. *Journal of Economic Studies*, 34(2), 136–156. Retrieved from <https://doi.org/10.1108/01443580710745371> doi: 10.1108/01443580710745371
- Borghans, L., Duckworth, A. L., Heckman, J. J., & ter Weel, B. (2008). The economics and psychology of personality traits. *Journal of Human Resources*, 43(4), 972–1059. doi: 10.3368/jhr.43.4.972
- Bourque, J., Doucet, D., LeBlanc, J., Dupuis, J., & Nadeau, J. (2019). Cronbach's alpha is one of the worst internal consistency estimators: a simulation study. *Revue des sciences de l'éducation*, 45(2), 78. Retrieved from <https://doi.org/10.7202/1067534ar> doi: 10.7202/1067534ar
- Brown, S., & Taylor, K. (2014, dec). Household finances and the ‘big five’ personality traits.

- Journal of Economic Psychology*, 45, 197–212. Retrieved from <https://doi.org/10.1016/j.joep.2014.10.006> doi: 10.1016/j.joep.2014.10.006
- Buccioli, A., & Zarri, L. (2017, jun). Do personality traits influence investors' portfolios? *Journal of Behavioral and Experimental Economics*, 68, 1–12. Retrieved from <http://dx.doi.org/10.1016/j.socec.2017.03.001> doi: 10.1016/j.socec.2017.03.001
- Chavan, P. (2007, August). Access to Bank Credit: Implications for Dalit Rural Households. *Economic & Political Weekly*, 42(31), 3219–3224. Retrieved from <http://www.jstor.org/stable/4419871>
- Cobb-Clark, D. A., & Tan, M. (2011, January). Noncognitive skills, occupational attainment, and relative wages. *Labour Economics*, 18(1), 1–13. Retrieved from <https://doi.org/10.1016/j.labeco.2010.07.003> doi: 10.1016/j.labeco.2010.07.003
- Cook, D. O., Kieschnick, R., & McCullough, B. (2008, dec). Regression analysis of proportions in finance with self selection. *Journal of Empirical Finance*, 15(5), 860–867. Retrieved from <https://doi.org/10.1016/j.jempfin.2008.02.001> doi: 10.1016/j.jempfin.2008.02.001
- Costa, P. T., & McCrae, R. R. (1997). Longitudinal Stability of Adult Personality. In R. Hogan, J. A. Johnsson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 269–290). San Diego: Academic Press.
- Cox, D., & Jappelli, T. (1993, may). The effect of borrowing constraints on consumer liabilities. *Journal of Money, Credit and Banking*, 25(2), 197. Retrieved from <https://doi.org/10.2307/2077836> doi: 10.2307/2077836
- Cronbach, L. J. (1951, sep). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. Retrieved from <https://doi.org/10.1007/BF02310555> doi: 10.1007/bf02310555
- Crook, J. (2001, feb). The demand for household debt in the USA: evidence from the 1995 survey of consumer finance. *Applied Financial Economics*, 11(1), 83–91. Retrieved from <http://dx.doi.org/10.1080/09603100150210291> doi: 10.1080/09603100150210291
- D'Alessio, G., & Iezzi, S. (2013). Household over-indebtedness: Definition and measurement with Italian data. *SSRN Electronic Journal*. Retrieved from <https://doi.org/10.2139/ssrn.2243578> doi: 10.2139/ssrn.2243578
- Dasgupta, U., Mani, S., Sharma, S., & Singhal, S. (2020, dec). *Caste gaps in behaviour and personality traits: A study of university students* (blog). Ideas for India. Retrieved from <https://www.ideasforindia.in/topics/social-identity/caste-gaps-in-behaviour-and-personality-trait-a-study-of-university-students.html>

(Accessed July 15, 2021)

- Deary, I. J. (2014, aug). The stability of intelligence from childhood to old age. *Current Directions in Psychological Science*, 23(4), 239–245. Retrieved from <https://doi.org/10.1177/0963721414536905> doi: 10.1177/0963721414536905
- del Río, A., & Young, G. (2006, oct). The determinants of unsecured borrowing: evidence from the BHPS. *Applied Financial Economics*, 16(15), 1119–1144. Retrieved from <http://dx.doi.org/10.1080/09603100500438791> doi: 10.1080/09603100500438791
- Donnelly, G., Iyer, R., & Howell, R. T. (2012, dec). The big five personality traits, material values, and financial well-being of self-described money managers. *Journal of Economic Psychology*, 33(6), 1129–1142. Retrieved from <https://doi.org/10.1016/j.joep.2012.08.001> doi: 10.1016/j.joep.2012.08.001
- Drèze, J., Lanjouw, P., & Sharma, N. (1997, sep). *Credit in Rural India: A Caste Study* (Research Paper No. DEDPS06). LSE STICERD.
- Duca, J. V., & Rosenthal, S. S. (1993). Borrowing Constraints, Household Debt, and Racial Discrimination in Loan Markets. *Journal of Financial Intermediation*, 3(1), 77–103. Retrieved from <https://doi.org/10.1006/jfin.1993.1003> doi: 10.1006/jfin.1993.1003
- Fondeville, N., Ozdemir, E., & Ward, T. (2010). *Over-indebtedness: New evidence from the eu-silc special module* (resreport No. 4). European Commission Research Note.
- Forlicz, M., & Rólczyński, T. (2019, sep). Overdue debt and selected personality traits – a research based on international surveys. *Journal of International Studies*, 12(3), 198–211. doi: 10.14254/2071-8330.2019/12-3/16
- Gaurav, S., & Singh, A. (2012, sep). An Inquiry into the Financial Literacy and Cognitive Ability of Farmers: Evidence from Rural India. *Oxford Development Studies*, 40(3), 358–380. Retrieved from <https://doi.org/10.1080/13600818.2012.703319> doi: 10.1080/13600818.2012.703319
- Gerhard, P., Gladstone, J. J., & Hoffmann, A. O. (2018, apr). Psychological characteristics and household savings behavior: The importance of accounting for latent heterogeneity. *Journal of Economic Behavior & Organization*, 148, 66–82. doi: 10.1016/j.jebo.2018.02.013
- Groves, M. O. (2005, dec). How important is your personality? labor market returns to personality for women in the US and UK. *Journal of Economic Psychology*, 26(6), 827–841. Retrieved from <https://doi.org/10.1016/j.joep.2005.03.001> doi: 10.1016/j.joep.2005.03.001
- Guérin, I. (2014, aug). Juggling with debt, social ties, and values. *Current Anthropology*, 55(S9), 40–50. doi: 10.1086/675929

- Guiso, L., & Sodini, P. (2013). Household finance: An emerging field. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 2, pp. 1397–1532). Elsevier. Retrieved from <https://doi.org/10.1016/B978-0-44-459406-8.00021-4> doi: 10.1016/b978-0-44-459406-8.00021-4
- Guérin, I., D'Espallier, B., & Venkatasubramanian, G. (2013, sep). Debt in rural south india: Fragmentation, social regulation and discrimination. *Journal of Development Studies*, 49(9), 1155–1171. Retrieved from <https://doi.org/10.1080/00220388.2012.720365> doi: 10.1080/00220388.2012.720365
- Guérin, I., Lanos, Y., Michiels, S., Nordman, C. J., & Venkatasubramanian, G. (2017, dec). Insights on demonetisation from rural tamil nadu: understanding social networks and social protection. *Review of rural affairs*, 52(52).
- Guérin, I., Michiels, S., Natal, A., Nordman, C. J., & Venkatasubramanian, G. (2021). Surviving debt, survival debt in times of lockdown. *Economic & Political Weekly*. (Forthcoming)
- Guérin, I., Mouchel, C., & Nordman, C. J. (2021). With a Little Help From My Friends? Surviving the Lockdown using Social Networks in Rural South India. *South Asia Multidisciplinary Academic Journal*. (Forthcoming)
- Guérin, I., Roesch, M., Venkatasubramanian, G., & Kumar, K. S. S. (2014). The social meaning of over-indebtedness and creditworthiness in the context of poor rural south indian households (tamil nadu). In I. Guérin, S. Morvant-Roux, & M. Villarreal (Eds.), *Microfinance, debt and over-indebtedness: Juggling with money*. New-York: Routledge.
- Hanushek, E. A., & Woessmann, L. (2008, aug). The role of cognitive skills in economic development. *Journal of Economic Literature*, 46(3), 607–668. Retrieved from <http://www.aeaweb.org/articles.php?doi=10.1257/jel.46.3.607> doi: 10.1257/jel.46.3.607
- Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013, aug). Financial literacy, financial education, and economic outcomes. *Annual Review of Economics*, 5(1), 347–373. Retrieved from <https://doi.org/10.1146/annurev-economics-082312-125807> doi: 10.1146/annurev-economics-082312-125807
- Heckman, J. J. (2011, August). *Integrating personality psychology into economics* (Working Paper No. 17378). Cambridge MA: National Bureau of Economic Research - NBER. Retrieved from <http://www.nber.org/papers/w17378> doi: 10.3386/w17378
- Horn, S., Jamison, J. C., Karlan, D., & Zinman, J. (2021). *Is financial literacy necessary for greater savings? Evidence from Uganda* (blog). VoxDev. Retrieved from <https://voxddev.org/topic/finance/financial-literacy-necessary-greater-savings-evidence-uganda> (Accessed August 06, 2021)

- Huston, S. J. (2010, jun). Measuring financial literacy. *Journal of Consumer Affairs*, 44(2), 296–316. Retrieved from <https://doi.org/10.1111/j.1745-6606.2010.01170.x> doi: 10.1111/j.1745-6606.2010.01170.x
- Imai, K., & Kim, I. S. (2020, November). On the use of two-way fixed effects regression models for causal inference with panel data. *Political Analysis*, 29(3), 405–415. Retrieved from <https://doi.org/10.1017/pan.2020.33> doi: 10.1017/pan.2020.33
- Jones, J. H. M. (1994, March). A Changing Financial Landscape in India: Macro-Level and Micro-Level Perspectives. In F. J. A. Bouman & O. Hospes (Eds.), *Financial Landscapes Reconstructed: The Fine Art of Mapping Development* (pp. 305–324). Routledge. Retrieved from <https://doi.org/10.4324/9780429038891-18> doi: 10.4324/9780429038891-18
- Kassin, S. (2003). *Psychology*. Pearson.
- Keese, M. (2012, feb). Who feels constrained by high debt burdens? subjective vs. objective measures of household debt. *Journal of Economic Psychology*, 33(1), 125–141. Retrieved from <https://doi.org/10.1016/j.jeop.2011.08.002> doi: 10.1016/j.jeop.2011.08.002
- Kiely, K. M. (2014). Cognitive function. In *Encyclopedia of quality of life and well-being research* (pp. 974–978). Springer Netherlands. Retrieved from https://doi.org/10.1007/978-94-007-0753-5_426 doi: 10.1007/978-94-007-0753-5_426
- Klapper, L., Lusardi, A., & Panos, G. (2012, mar). *Financial literacy and the financial crisis* (Working Paper No. 17930). National Bureau of Economic Research - NBER. Retrieved from <https://www.nber.org/papers/w17930> doi: 10.3386/w17930
- Kropko, J., & Kubinec, R. (2020, April). Interpretation and identification of within-unit and cross-sectional variation in panel data models. *PLOS ONE*, 15(4), e0231349. Retrieved from <https://doi.org/10.1371/journal.pone.0231349> doi: 10.1371/journal.pone.0231349
- Laajaj, R., & Macours, K. (2019, October). Measuring skills in developing countries. *Journal of Human Resources*, 1018–9805R1. Retrieved from <https://doi.org/10.3368/jhr.56.4.1018-9805r1> doi: 10.3368/jhr.56.4.1018-9805r1
- Laajaj, R., Macours, K., Hernandez, D. A. P., Arias, O., Gosling, S. D., Potter, J., ... Vakis, R. (2019, jul). Challenges to capture the big five personality traits in non-WEIRD populations. *Science Advances*, 5(7). Retrieved from <https://doi.org/10.1126/sciadv.aaw5226> doi: 10.1126/sciadv.aaw5226
- Lennox, C. S., Francis, J. R., & Wang, Z. (2011, nov). Selection models in accounting research. *The Accounting Review*, 87(2), 589–616. Retrieved from <https://doi.org/10.2308/accr-10195> doi: 10.2308/accr-10195

- London, M. (Ed.). (2011). *The Oxford Handbook of Lifelong Learning*. Oxford University Press.
doi: 10.1093/oxfordhb/9780195390483.001.0001
- Maddala, G. S. (1991, October). A Perspective on the Use of Limited-Dependent and Qualitative Variables Models in Accounting Research. *The Accounting Review*, 66(4), 788–807.
Retrieved from <https://www.jstor.org/stable/248156>
- McCrae, R. R., Costa, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., ...
Smith, P. B. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology*, 78(1), 173–186. Retrieved from <https://doi.org/10.1037/0022-3514.78.1.173> doi: 10.1037/0022-3514.78.1.173
- McDonald, R. P. (1999). *Test Theory: A Unified Treatment*. New-York: Psychology Press. Retrieved from <https://doi.org/10.4324/9781410601087> doi: 10.4324/9781410601087
- McFadden, D. L. (1979). Quantitive Methods for Analysing Travel Behaviour of Individuals: Some Recent Development. In D. A. Hensher & P. R. Stopher (Eds.), *Behavioural travel modelling* (chap. 13). London: Routledge.
- Michiels, S., Nordman, C. J., & Seetahul, S. (2021). Many Rivers to Cross: Social Identity, Cognition and Labour Mobility in Rural India. *The ANNALS of the American Academy of Political and Social Science, Special Issue on Cognition and Migration*. (Forthcoming)
- Moen, P., Elder Jr., G. H., & Lüscher, K. (Eds.). (1995). *Examining Lives in Context: Perspectives on the Ecology of Human Development*. Washington DC: American Psychological Association.
- Mortimer, J. T., & Simmons, R. G. (1978, aug). Adult socialization. *Annual Review of Sociology*, 4(1), 421–454. Retrieved from <https://doi.org/10.1146/annurev.so.04.080178.002225> doi: 10.1146/annurev.so.04.080178.002225
- Mukherjee, P. (2017, November). *The Effects of Social Identity on Aspirations and Learning Outcomes: A Field Experiment in India* (Working Paper No. S-35120-INC-7). London, UK: International Growth Center.
- Nair, T. S. (2011, February). Microfinance: Lessons from a Crisis. *Economic & Political Weekly*, 46(06).
- Nga, J. K., & Yien, L. K. (2013, aug). The influence of personality trait and demographics on financial decision making among generation y. *Young Consumers*, 14(3), 230–243. doi: 10.1108/yc-11-2012-00325
- Nordman, C. J., Guérin, I., Michiels, S., Natal, A., & Venkatasubramanian, G. (2019, December). *NEEMSIS Survey Report: A Full Statistical Picture of the Household and Individual Data* (techreport). French Institute of Pondicherry (IFP) and Institut de Recherche pour le Développement (IRD). Retrieved from <https://neemsis.hypotheses.org/ressources/>

statistical-report

- Nordman, C. J., Guérin, I., Venkatasubramanian, G., Michiels, S., Lanos, Y., Kumar, S., ... Hilger, A. (2017, November). *Neemsis survey manuel* (techreport). 11, rue Saint-Louis, 605-001 Pondichéry, Inde: Institut Français de Pondichéry - IFP, Institut de Recherche pour le Développement - IRD. Retrieved from <https://neemsis.hypotheses.org/> (Networks, Employment, dEbt, Mobilities and Skills in India Survey (NEEMSIS))
- NSSO. (2014, December). *Key Indicators of Debt and Investment in India, NSS 70th Round, 2013* (Tech. Rep. No. NSS-KI(70/18.2)). New-Delhi, India: Government of India & Ministry of Statistics and Programme Implementation & National Sample Survey Office (NSSO).
- Nyhus, E. K., & Pons, E. (2005, jun). The effects of personality on earnings. *Journal of Economic Psychology*, 26(3), 363–384. Retrieved from <https://doi.org/10.1016/j.joep.2004.07.001> doi: 10.1016/j.joep.2004.07.001
- Nyhus, E. K., & Webley, P. (2001, November). The role of personality in household saving and borrowing behaviour. *European Journal of Personality*, 15(S1), S85–S103. Retrieved from <https://doi.org/10.1002/per.422> doi: 10.1002/per.422
- Parise, G., & Peijnenburg, K. (2019, October). Noncognitive abilities and financial distress: Evidence from a representative household panel. *The Review of Financial Studies*, 32(10), 3884–3919. Retrieved from <https://doi.org/10.1093/rfs/hhz010> doi: 10.1093/rfs/hhz010
- Peebles, G. (2010, oct). The anthropology of credit and debt. *Annual Review of Anthropology*, 39(1), 225–240. Retrieved from <https://doi.org/10.1146/annurev-anthro-090109-133856> doi: 10.1146/annurev-anthro-090109-133856
- Pinjisakikool, T. (2017, feb). The effect of personality traits on households' financial literacy. *Citizenship, Social and Economics Education*, 16(1), 39–51. Retrieved from <https://doi.org/10.1177/2047173417690005> doi: 10.1177/2047173417690005
- Rajakumar, J. D., Mani, G., Shetty, S. L., & Karmarkar, V. M. (2019, March). Trends and patterns of household indebtedness. *Economic & Political Weekly*, 54(9), 41–49.
- Reboul, E., Guérin, I., & Nordman, C. J. (2021, jun). The Gender of Debt and Credit: Insights from rural Tamil Nadu. *World Development*, 142, 105363. Retrieved from <https://doi.org/10.1016/j.worlddev.2020.105363> doi: 10.1016/j.worlddev.2020.105363
- Rinaldi, L., & Sanchis-Arellano, A. (2006, January). *Household debt sustainability: What explains household non-performing loans? an empirical analysis* (resreport No. 570). European Central Bank. Retrieved from <https://ssrn.com/abstract=872528>
- Sarkar, S., Chakravorty, B., & Lyonette, C. (2020, November). *Social identity and aspiration –*

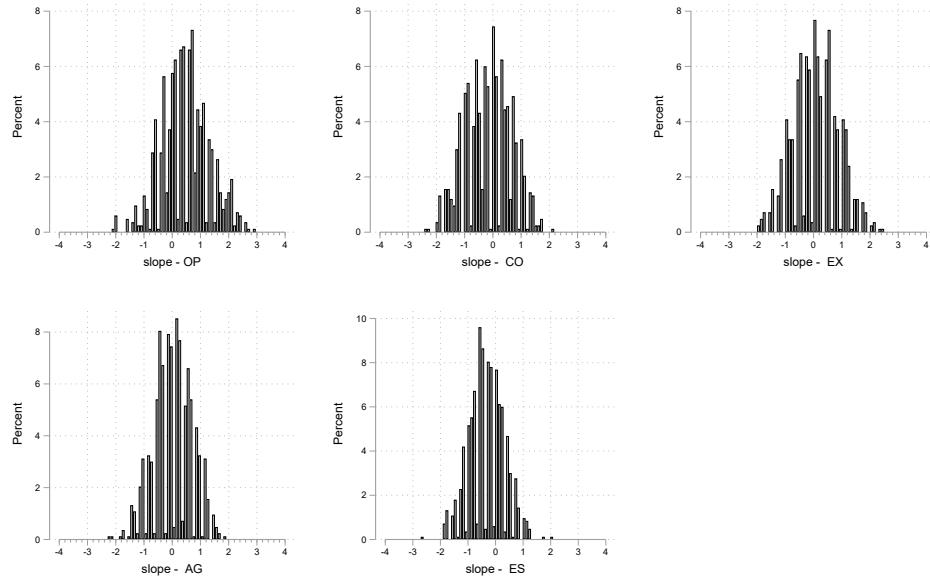
Double jeopardy or intersectionality? Evidence from rural India (Discussion Paper No. 724).
Essen, Germany: Global Labor Organization.

Sriram, M. S. (2010, October). Microfinance: A Fairy Tale Turns into a Nightmare. *Economic & Political Weekly*, 45(43).

Trizano-Hermosilla, I., & Alvarado, J. M. (2016, may). Best Alternatives to Cronbach's Alpha Reliability in Realistic Conditions: Congeneric and Asymmetrical Measurements. *Frontiers in Psychology*, 7. Retrieved from <https://doi.org/10.3389/fpsyg.2016.00769> doi: 10.3389/fpsyg.2016.00769

Valerio, A., Sanchez Puerta, M. L., Pierre, G., Rajadel, T., & Monroy Taborda, S. (2014, June). *STEP Skills Measurement Program - Snapshot 2014* (Tech. Rep.). Washington, DC, USA: The World Bank. Retrieved from <https://microdata.worldbank.org/index.php/catalog/step/about>

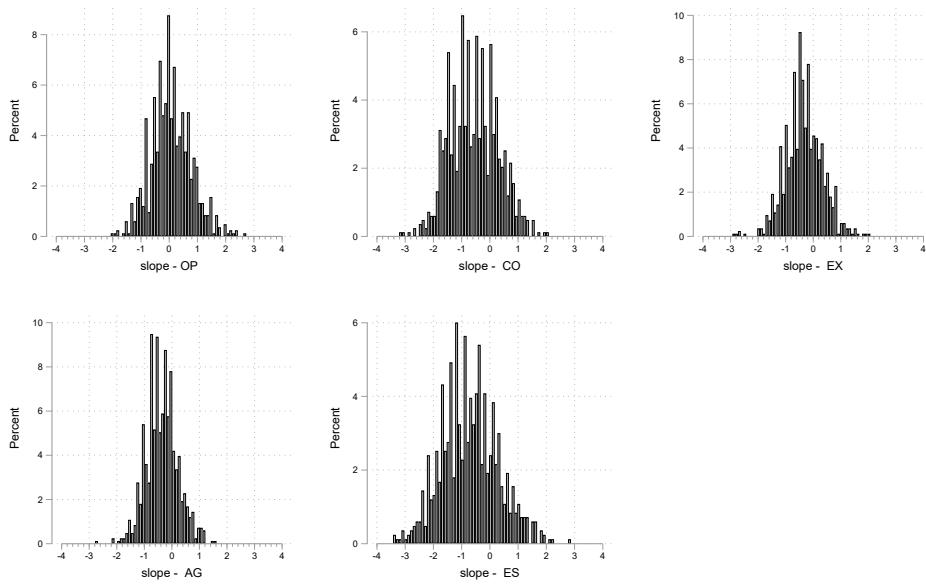
A Stability of skills over time



Raw traits (non-corrected from acquiescence bias).

Figure 3: Stability over time of Big-5 personality traits non-corrected from acquiescence bias – Distribution of the difference of the score between 2016-17 and 2020-21 for Big-5 personality traits non-corrected from acquiescence bias for 835 individuals from rural Tamil Nadu, India.

Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21); author's calculations.



Traits corrected from acquiescence bias.

Figure 4: Stability over time of Big-5 personality traits corrected from acquiescence bias – Distribution of the difference of the score between 2016-17 and 2020-21 for Big-5 personality traits corrected from acquiescence bias for 835 individuals from rural Tamil Nadu, India.

Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21); author's calculations.

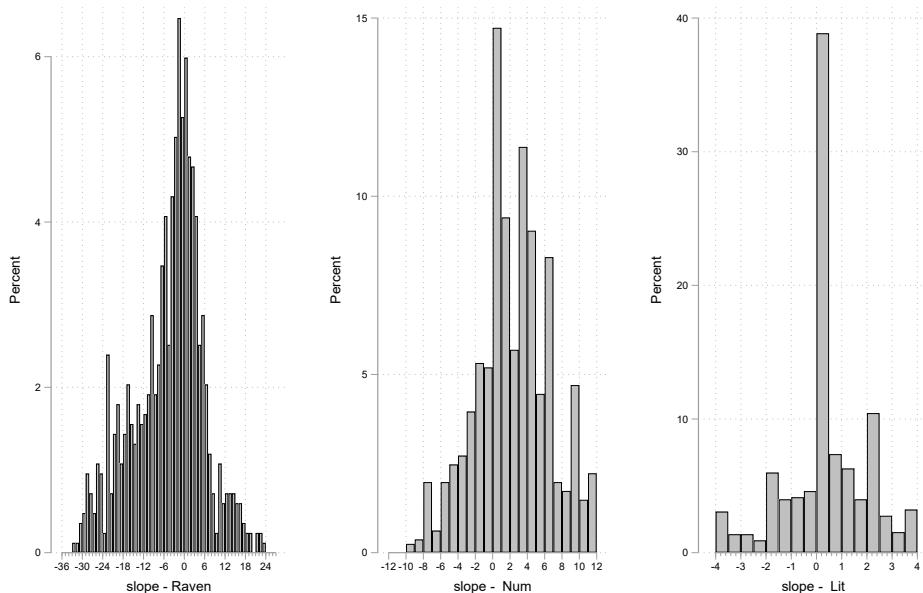


Figure 5: Stability over time of cognitive skills – Distribution of the difference of the score between 2016-17 and 2020-21 for three cognitive skills for 835 individuals from rural Tamil Nadu, India.

Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21); author's calculations.

B Factor analysis for personality traits

Table 10: Details for personality test questions

Variable	Question	Big-5 traits
curious	Are you curious, interested in learning new things?	OP
interestbyart	Are you interested in nature, art or music?	OP
repetitivetasks	Do you prefer work that involves repetitive tasks and routines?	OP
inventive	Are you inventive, and discover new ways of doing things?	OP
liketothink	Do you like to think a lot, and reflect about ideas?	OP
newideas	Do you come up with original or new ideas?	OP
activeimagination	Do you have an active imagination?	OP
organized	Are you organized?	CO
makeplans	Do you make plans and stick to them?	CO
workhard	Do you work hard to do things well and on time?	CO
appointmentontime	Do you get to work and appointments on time?	CO
putoffduties	Do you put off your duties in order to relax?	CO
easilydistracted	Do you get easily distracted?	CO
completeduties	Do you complete your duties on time?	CO
enjoypeople	Do you enjoy being with people?	EX
sharefeelings	Do you easily share your thoughts and feelings with other people?	EX
shywithpeople	Are you shy with people?	EX
enthusiastic	Are you enthusiastic and full of energy?	EX
talktomanypeople	In social gatherings, do you like to talk to many people?	EX
talkative	Are you talkative?	EX
expressedthoughts	Are you comfortable expressing your thoughts and opinions to others?	EX
workwithother	Do you work well with other people?	AG
understandotherfeeling	Do you try to understand how other people feel and think?	AG
trustingofother	Are you generally trusting of other people?	AG
rudeattother	Do you tend to be rude to other people?	AG
toleratefaults	Do you tolerate faults in other people?	AG
forgiveother	Do you forgive other people easily?	AG
helpfulwithothers	Are you helpful with others?	AG
managestress	Do you manage stress well?	ES
nervous	Do you get nervous easily?	ES
changemood	Do you have sudden changes in your mood?	ES
feeldepressed	Do you feel sad, depressed?	ES
easilyupset	Do you get easily upset?	ES
worryalot	Do you worry a lot?	ES
staycalm	Do you stay calm in tense or stressful situations?	ES

Source: NEEMSI-1 (2016-17) & NEEMSI-2 (2020-21)

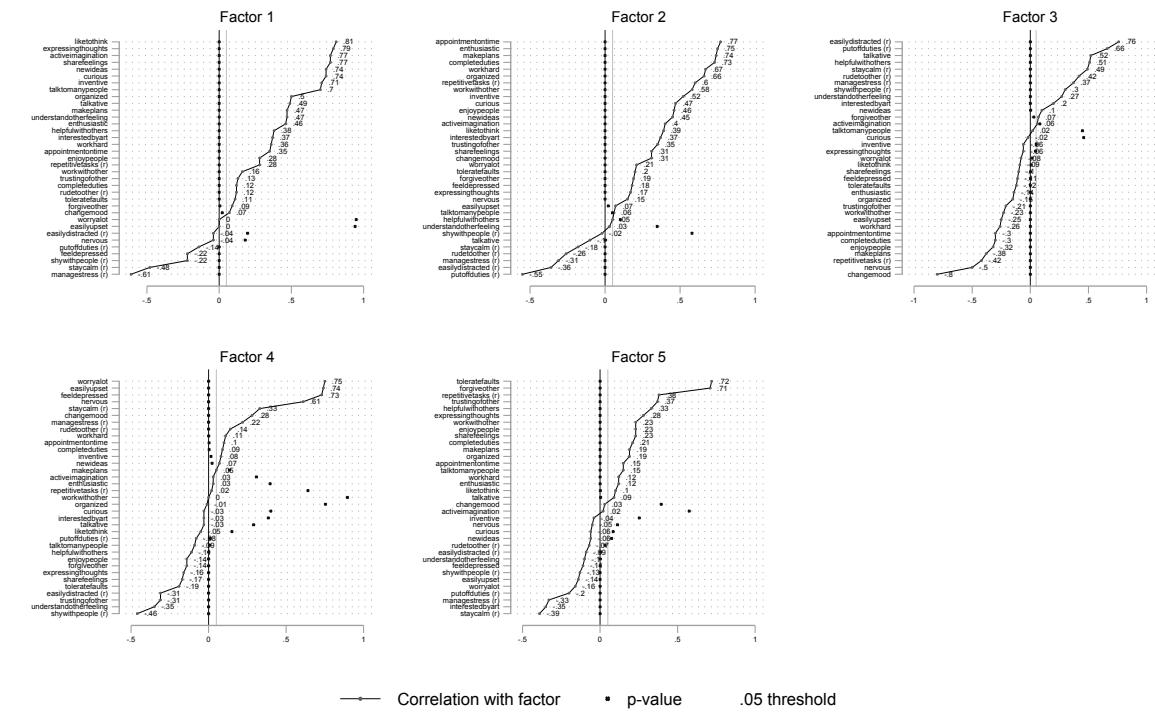


Figure 6: Results of factor analysis for 2016-17 raw items
Source: NEEMSSIS-1 (2016-17); author's calculations.

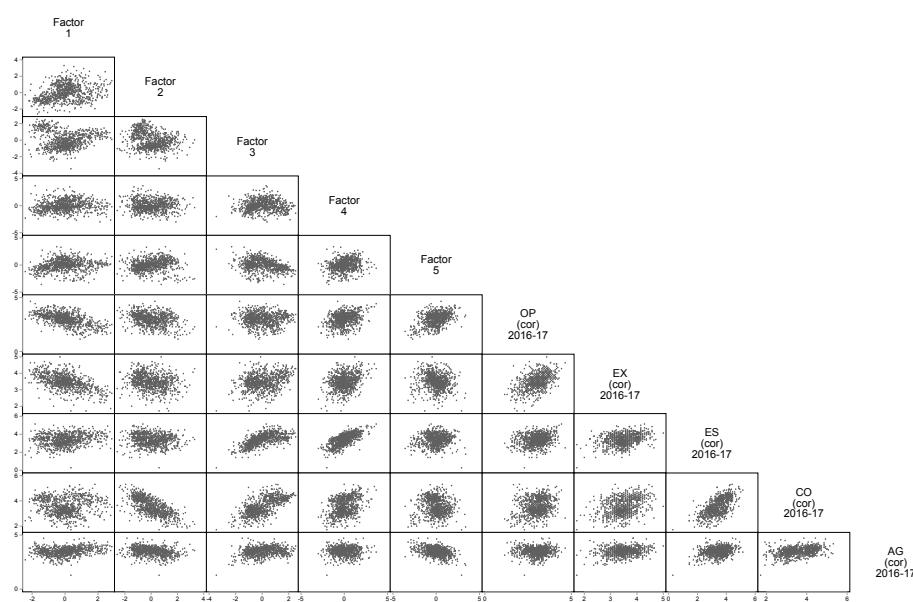


Figure 7: Correlation between Factor from EFA and Big-5 personality traits
Source: NEEMSSIS-1 (2016-17); author's calculations.

Contents

1	Introduction	1
2	Data and methodology	5
2.1	Data	5
2.2	Construction of personality traits & cognitive skills variables	6
2.3	Indebtedness measures	8
2.4	Econometric framework	9
	How PT&CS shape individual debt?	9
	How the PT&CS varies across the indebtedness distribution?	11
	How PT&CS influences the debt trajectory?	12
	How does debt change over time as PT&CS changes?	12
3	Descriptive statistics	13
3.1	Household unit in Table 1	13
3.2	Individual unit in Table 2	13
4	Results	16
4.1	How PT&CS shape individual debt?	18
	Probability of being indebted	18
	Total amount of debt	18
	Individual debt service ratio	19
4.2	How PT&CS varies across the indebtedness distribution?	20
4.3	How PT&CS influences the debt trajectory?	20
4.4	How does debt change over time as PT&CS changes?	20
5	Discussion and conclusion	24
	PT&CS and debt in the literature	24
	Literature on individual debt practices	25
	PT&CS and other outcomes in rural India	25
	Conclusion	25
6	Conclusion	25
References		26

Appendix	34
A Stability of skills over time	34
B Factor analysis for personality traits	36