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ABSTRACT

The Effects of Over-Indebtedness on Individual Health*

This paper uses data from the 2002-2005-2008 waves of the Spanish Survey of Household Finances (EFF) to investigate whether debts burdens hamper people's health. Several measures of debt strain are constructed, including debt-to-income ratios, the existence of debt arrears and amounts of outstanding debts. The paper also differentiates between mortgage and non-mortgage debts and explores the role of social norm effects in the debt-health relationship. The results, based on a random effects model extended to include a Mundlak term, show that non-mortgage debt payments and debt arrears affect significantly people's health. Furthermore, mild social norm effects are detected, according to which being less indebted than the reference group results, ceteris paribus, in better health.

JEL Classification: G01, I13, I22

Keywords: over-indebtedness, self-assessed health, random effects model, social norm effects

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1. Introduction

Over the past two decades there has been a rapid build-up of household debt, making over-indebtedness of individuals and families a widespread phenomenon in the EU area. Moreover, the recent credit crunch and the successive economic recession have risen the number of households that face severe debt-related financial difficulties. Apart from political concerns on households' ability to sustain their debt burdens, household's financial fragility is likely to impact people's health. Debt imposes non-negligible psychological costs on citizens and, arguably, has detrimental consequences on people's mental and physical health through anxiety, stress, increased cardiovascular risk, depression, self-harm and suicidal ideation. For instance, suicide rates have been rising in the EU since 2008, when the euro area entered a recession, especially in those countries where financial reversals of fortune have been severest (Stuckler et al., 2012).

Understanding the pathways through which financial strain threatens individual health is a relevant economic issue. This is precisely the objective of this paper. We use longitudinal data from the Spanish Survey *of Household Finances* (EFF) to investigate the relation between household debt and health. The main feature of this survey is that apart from conventional socio-economic characteristics it contains microeconomic information on a vast array of household's assets and debts, including self-reported information on financial hardship in the form of arrears on debt payments. We take advantage of this information to construct indicators of household financial strain, including debt payments-to-income ratios, the existence of debt arrears and amounts of outstanding debts.

Our findings are four. First, we confirm with Spanish data previous findings that over-indebtedness, as measured by the debt-to-income ratios, is negatively associated with health. However, we find that this effect is driven by non-mortgage debts. Monthly mortgage payments are innocuous in terms of health. Second, we show that conditional on a full vector of individual and household characteristics, including income and wealth, individuals with debts arrears are significantly worse off. This effect is well defined and robust across specifications, and suggests that the interplay between debt and health is not merely driven by less disposable income and resources. This notion is supported by our next finding. Third, existing papers on the topic are mostly based on income data and monthly debt payments. However, our data set contains

microeconomic information on a vast array of household's assets and debts. We find that monthly debt-to-income ratios are not significant for health determination once explicit controls for outstanding debt amounts are included in the regressions. Four, we examine whether there are 'social norm effects' in the debt-health relationship. The adverse psychological effects suffered by over-indebted individuals might arise in large part due stigma effects. Even though financial burdens hurt, people may feel relatively better once they know that a large part of the population are also affected by financial strain and debts. If household over-indebtedness is prevalent in the society, households are likely to improve their perceived financial safety. As far as we know, Gathergood (2012) is the only study that, yet using only mortgage debt, has addressed the matter. Although he focuses on household flows (payments) and disregards stocks (debts), his results are suggestive of social norm effects.

The paper is organized as follows. The next section provides an overview on the relationship between health and debt, with special attention to the Spanish experience. Section 3 describes the data set and the measures of over-indebtedness and health used in the paper. Section 4 presents the method of analysis and the research hypotheses. The construction of the reference groups is described and the model is extended to allow for social norm effects. Section 5 introduces the estimating equation and describes the econometric strategy. Section 6 includes a detailed description of relevant empirical facts and discusses the regression results. Section 7 outlines and discusses potential limitations our paper. Section 8 presents the concluding remarks.

2. The relationship between health and debt

The relationship between health and socioeconomic status (SES) has received much attention in the literature. Socioeconomic status represents the position of an individual in the society and a number of SES measures have been proposed, including income, wealth, labor force status, education, and race/ethnicity. Many studies have focused on income. After controlling for significant determinants of health such as gender, age, educational level and occupation, a strong positive correlation is widely found between health and income (Kawachi et al., 2010; Gunasekara et al., 2011, for a survey of recent literature based on longitudinal data).

However, income is a flow and, as such, it is unable to capture long term financial conditions that, arguably, are more important determinants of health than current income. To the extent that changes in health and illness are likely to develop over a considerable time span, it is important to consider long-term conditions of individuals and households whenever it is practically possible. It has long been recognized that wealth is a more meaningful and predictive indicator of material well-being than income because it reflects lifetime accumulation of finances status (Henretta and Campbell, 1978). However, the literature relating health to wealth is scarce, due to the limited availability of micro data with reliable indicators of household wealth. The few studies that analyze the wealth-health nexus suggest that wealth differentials account significantly for differences in health status. For instance, results from the Whitehall studies on middle-aged British civil servants indicate that wealth is associated with lower prevalence of poor self-rated health and clinical conditions, in excess of the effect of income (Martikainen et al., 2003; Perel et al., 2006; Aittomäki et al., 2010). Other studies have also reported associations of household wealth with decreased risk of stroke (Avendano and Glymour, 2008) and psychological distress (Carter et al., 2009).

There is also support in the literature for a correlation between debt burdens and health (Brown et al., 2005; Duygan-Bump and Grant, 2009). Over-indebtedness may affect individual health status for several reasons. First, debt problems are associated with lowered self-esteem, an increasingly pessimistic outlook on life, and reduced mental health due to depression, severe anxiety and hostility (Fitch et al., 2007; Bridges and Disney, 2010). Second, debt is associated with declining physical health. To the extent that high repayment burdens may tighten the financial situation of families, they may save on costly medical care utilization and health protection such as, for example, healthy food, that is typically more expensive than junk food (Drentea and Lavrakas, 2000). Third, financial hardship inhibits rational behavior and can be associated with non-healthy behaviors such as excessive drinking, smoking and excess caloric intake (Grafova, 2007; Wardle et al., 2012; Averett and Smith, 2014). Fourth, there is a link between financial stress and suicide. Specifically, financial problems have been found to lead to more suicide attempts than nearly all other psychological conditions, except depression (Wang et al., 2012).

Despite the number of studies that have documented the association between debt problems and health, the causal impact of debt on health is still a contested matter. The

most important concern is reverse causality. Few attempts in the literature have traced the links in the chain of causation from debt to health and from health back to debt. While the results are mixed, most studies suggest that the direction of causality runs from indebtedness to poor health[1]. Using the British Household Panel Survey (BHPS), Brown et al. (2005) follow a two-stage estimation procedure to control for the potential endogeneity of debt and savings when explaining heads of household's psychological well-being. Their results indicate that debt has important psychological costs. A similar finding is reported in Bridges and Disney (2010), who rely on a recursive bivariate probit to address the potential endogeneity of household financial indebtedness. Keese and Schmitz (2014) analyze the relationship between household indebtedness and different health outcomes using data from the German Socioeconomic Panel. They apply fixed-effects and resort to a subsample of constantly employed individuals to reduce problems of reverse causality. Their results suggest moderate effects of debt on health, which are qualitatively the same for two distinct debt measures, consumer credit and home loans.

Other studies have resorted to instrumental variables. Using the Panel Study of Income Dynamics (PSID), Meer et al., (2003) rely on inheritance receipts as an exogenous source for changes in wealth. They find that health is essentially unresponsive to changes in wealth. A similar finding is reported by Lyons and Yilmazer (2005) who, using the Survey of Consumer Finances (SCF), instrument the extent of financial strain using household's attitudes towards management and borrowing, and information on whether the household experienced a health-unrelated negative income shock. In contrast, Lau and Leung (2011) find that mortgage indebtedness exerts a negative impact on health outcomes. They use declines in home values post 2006 as an exogenous shock toidentify the effect of loan-to-value on health and data from the US Health and Retirement Survey. More recently, Gathergood (2012) relies on movements in local-level house prices as exogenous variations of mortgage arrears. His results, based on BHPS data, show that part of the observed cross-sectional variation in psychological health between those with and without problem debts is due to (endogenous) selection into problem debt.

[1] Some exceptions are Smith and Kington (1997) and Lyons and Yilmazer, (2005).

2.1 Social norm effects

There is evidence of conspicuous peer effects and social comparisons in a number of economic domains, including labour supply and work effort (Lindbeck et al., 1999; Clark et al., 2010), and the relation between income and job (Brown et al., 2008), economic (Clark et al., 2009) and life satisfaction (Clark et al., 2008, for a review). Economic comparisons have neurobiological underpinnings, serve an evolutionarily useful informational role and dramatically influence the physical and psychological health of an individual (Zizzo, 2002; Sapolsky, 2004). For instance, Clark (2003) shows that the impact of unemployment on psychological health is less severe for individuals who live in localities in which the unemployment rate is higher, and hence it is more of a 'social norm' among the population.

The economic deprivation hypothesis was first introduced by Yitzhaki (1979). He defined the degree of deprivation inherent in not having access to a specific good as an increasing function of the proportion of individuals in the reference group who have such good. The hypothesis suggests that, even if individuals meet the subsistence standard of living, they may be relatively deprived if they fail to meet the desirable standard of living set by the rest of the society. Interpersonal comparisons may produce frustration and stress, which can damage the cardiovascular system both directly (heart disease, high blood pressure) and indirectly (diet, tobacco, alcohol) (Marmot, 2003). The literature on health determinants has relied on this type of indexes when exploring health gradients and relative effects. For instance, using RE logistic estimations Eibner et al., (2004), found that relative income deprivation – in the sense of Yitzhaki (1979) – is associated with an increase in the risk of depressive and anxiety disorders and generally poor mental health. However, there is evidence that socioeconomic gradients in health are driven by gender (Contoyannis et al., 2004) and that financial strain may be far-reaching on women's mental (Kessler et al., 2003) and physical health (Hemingway, 2007, Du et al., 2008). Using data extracted from the BHPS and health measures drawn from the GHQ, Jones and Wildman (2008) show that income relative-deprivation measures are associated with mental-health disorders among women but not among men. In their setting, unobserved heterogeneity is accounted for by using the within-individual differences as instruments. Mangyo and Park (2010), using an econometric approach that controls for the endogeneity of income, find that deprivation relative to the income of relatives and neighbors exerts a slight negative effect on

mental health. Based on Spanish data from the Statistics on Income and Living Conditions (EU-SILC), Blázquez et al., (2014) show that the relationship between health and income operates through comparison information with respect to societal peers. Finally, turning to the crux of our analysis, Gathergood (2012) shows that individuals with debt repaying problems in localities with a higher bankruptcy rate experience less deterioration of their mental well-being.

2.2 The Spanish experience

The increased home ownership in the boom years left Spain with relatively high household debt in the euro area. Over-indebtedness of Spanish families in relation to the available income grew steadily until 2008. According to the European Commission (2010), in 2007 almost 12% of households with outstanding debts spent more than 40% of their income on debt servicing, and the figure was even higher for the income-poor. In June 2013, the volume of outstanding loans of private households amounted to 618,000 million euros (582,887 million euros where mortgages). According to the Bank of Spain, the default rate on these loans reached 5.16%, i.e., almost 32,000 million[2]. Both structural and cultural factors have been viewed as the cause of excess household indebtedness (Braucher, 2006). On the one hand, the deregulation of the credit market, and insecurity in family finances, coupled with an insufficient social safety net have been structural forces leading to a rapid rise in debt. On the other hand, a culture favorable to excessive consumption and borrowing has been also underlined as a potential explanation to the increase of household indebtedness.

The rise in debt has been particularly important in poorer and younger Spanish households. For instance, the share of households in the two lowest income deciles owning their primary residences increased from 71 percent to 78 percent between 2005 and 2009; this group being hit hard by the economic crisis (International Monetary Fund, 2012). It is well known that in Spain the process of job destruction during the crisis has been dramatic, with unemployment rates among young and low-skilled individuals reaching 50%. The junction of these factors has notably exacerbated the over-indebtedness problem of Spanish households. Repossessions and evictions have become an iconic image of the country's economic plight, leading to an increase in the

[2] In June 2013 the inter-annual growth rate of doubtful assets reached 34.%, in contrast to the 5.1% registered one year earlier (Banco de España, 2013).

number of citizens suffering severe stress and anxiety problems. Recently Gili et al., (2013) have shown that recession significantly increased the frequency of mental health disorders and alcohol abuse among primary care attendees in Spain, particularly among families experiencing unemployment and mortgage payment difficulties. Rates of suicide rose, especially among people who were about to be evicted from their homes. This phenomenon called the attention of social media, politicians and practitioners in the economic and medical spheres, and prompted Spanish authorities to declare, in November 2012, a two-year moratorium on some home repossessions. However, the Spanish legislation still fails to give courts the power to stop evictions of homeowners based on mortgage contracts that are deemed abusive.

3. Data set and measures

We use the longitudinal data extracted from the *Spanish Survey of Household Finances* (EFF), conducted by the Bank of Spain. This database provides very detailed microeconomic information on income, assets, debts and expenditures of Spanish households. Issued in 2002, it enabled researchers to conduct pioneering work on the financial status and net worth of families in Spain. The target population consists of all private homes throughout the country. The second and third waves were drawn in 2005 and 2008, respectively, and it has a panel structure. We retain adult individuals, aged between 30 and 80 years, with non-missing information for the selected variables. This results in a final sample of 13,480 observations.

3.1 Over-indebtedness

A common limitation that encompasses studies on debt and financial hardship is the lack of consensual measures of financial strain. There is no set of standardized and harmonized statistics on it, and empirical research on the matter is typically limited by data availability. Overall, people are considered over-indebted if they are having difficulties meeting (or are falling behind with) their household commitments, whether these relate to servicing secured[3] or unsecured borrowing, or to payments of rent, utility

[3] Secured borrowing refers to a loan that is backed with an asset held by the borrower; often their home.

or other household bills[4]. Therefore, over-indebtedness involves complex and multi-dimensional areas and can hardly be measured by just one indicator.

We use three measures of over-indebtedness. First, the EFF collects information on debt arrears by asking: "*In the last twelve months have you had any financial difficulties which resulted in you delaying the payment of any of your debts?*". This question provides a unique opportunity to investigate the extent of financial distress suffered by household members. Subjective evaluations are common in the field, partly due to the high costs of producing micro data with detailed household economic information, and pass well a number of validity tests. We complement this information with additional indicators. Specifically, we use information on monthly debt payments to calculate the second indicator of over-indebtedness: the debt payments-to-income ratio. It is generally accepted that the share of household income dedicated to debt repayments is an adequate measure of debt burden (Drentea and Lavrakas, 2000; Lyons and Yilmazer, 2005; Lau and Leung, 2011; Keese, and Schmitz, 2014). The third measure of financial strain used in the paper is the amount of pending debts. This is an important refinement, insofar as the earlier papers rely on monthly payments (flows) and disregard pending amount of debts (stocks). It is very likely that the health status of two individuals with the same values of debt payment-to-income ratios and other characteristics differ significantly due to differences in the amount of outstanding loans. In this respect we take advantage of the valuable information contained in the *EFF* on a vast array of household's assets and debts. We hypothesize that being conscientious of the amount pending debts has effects on individual health over and beyond the effects arising from monthly payments. Moreover, we discriminate among different types of debt: mortgage and non-mortgage. There is evidence that mortgage indebtedness is associated with depression, obesity, high blood pressure, poor health, decline in health, and mortality (Lau and Leung, 2011). The explanation behind the negative health shock imposed by mortgage indebtedness is twofold. On the one hand, indebted homeowners are more likely to experience financial stress, and stress can lead to unhealthy behaviors such as drinking, smoking, substance abuse, sleep problems and eating disorders. On the other hand, homeowners are more likely to reduce non-housing consumption in response to economic downturns due to the transaction costs of adjusting housing consumption

[4] See European Commission (2008) for an attempt to lay the foundation of a common definition of over-indebtedness susceptible to be implemented on a European-wide scale.

(Dietz and Haurin, 2003). However, to the best of our knowledge, the question of whether mortgage burdens are relatively more harmful for individual health that non-mortgage debt has not been answered. By differentiating between different types of debt in this paper we shed light on this issue.

3.2 Wealth

Most of the studies that analyze the mechanisms through which economic (dis)advantages affect health focus mainly on income, disregarding the effect of individuals' wealth. Although wealth and income are positively correlated, there are reasons to include household's wealth in the estimations. Firstly, income alone cannot account for the living standard of individuals and households. To the extent that wealth also affects living costs and contributes to the acquisition of permanent resources, it provides a more accurate information of long-term living conditions (Ecob and Davey Smith, 1999; Braveman et al., 2005). Secondly, health is more likely to be influenced by long-term accumulation of economic resources, rather than by monetary circumstances at a certain point of time. Previous works show stronger associations of long-term income than current income with health, and that low levels of household wealth are closely related with poor self-rated health (Martikainen et al., 2003) and high risk of mental health disorders (Perel et al., 2006). More recently, Aittomäki et al., (2010) show a stronger and more robust impact of wealth than of income on ill health, suggesting that long-term accumulation of economic resources is highly relevant.

In order to account for these effects, we include indicators of household wealth in the regressions. The wealth measure we use throughout this paper is net worth defined as assets minus debts. Assets include financial assets, pension wealth, main residence and other real estate wealth, business equity, vehicles and jewels, and other comparable valuables. All assets (including small businesses) are valued at market prices. Debts include housing debt, outstanding debts of properties and other payables, including personal loans, lines of credit, credit card debt and deferred payments, among others. Monetary amounts are adjusted for inflation and expressed in 2002 euros.

3.3 Self-assessed health

The EFF contains a subjective health status question with a five-point response scale ranging from '5- very good' to '1-very poor'.[5] Self-assessed health (SAH) has been widely used in the literature on the socioeconomic health-gradient (Smith, 1999; Frijters et al., 2005; Benzeval et al., 2011; Blázquez et al., 2014). Although the literature is controversial on the validity of subjective measures of health, social scientists frequently believe that self-evaluations of health reflect more accurately individuals' overall physical and mental well-being, and therefore are better predictors of individual labor force participation, retirement decisions, and other behaviors. In addition, self-reported measures of health have been shown to be significantly correlated with physicians' assessments and are a strong predictor of morbidity and mortality (Idler and Benyamini, 1997; Baker et al., 2001; Meer et al., 2003). Furthermore, unlike other indicators of health, most surveys across the world are very consistent in framing the question on self-assessment of health, facilitating cross-country comparisons with previous works (van Doorslaer and Xoolman, 2004).

4. Method of analysis

4.1 Specification and research hypotheses

Self-assessed health (SAH) is assumed to be a function of demographic characteristics (*X*), household income (Y), debt payments-to-income ratios (*P*), debt arrears (*F*), net total household debt (*D*) and household wealth (W)

$$SAH_{it} = f\big(SAH^{*}(X, Y, P, F, D, W)\big) \qquad (1)$$

Vector X includes a broad range of controls including age, marital status, education, employment status, household size and year dummies. To rule out the possibility that the negative effects of pending debts and debt payments on health are due to poor disposable income prospects in the future, we include two additional controls in vector X. These are two dummy variables indicating whether the respondents believe that their

[5] We reverted the original scale so that a negative coefficient in the regression results implies worse perceived health.

savings and spending, respectively, will be higher in the future than at present[6].

The empirical analysis will be based on different specifications of Eq. (1). We start by parsimonious specifications that disregard the potential role of wealth and outstanding debts. In these cases, SAH is assumed to depend on the debt-to-income ratio, P_{it} (Model 1), the extent of debt arrears reported by household members, F_{it} (Model 2), or both (Model 3). Next, we move on to allow for a differential effect of the debt-to-income ratios depending on the type of debt hold by the household. Specifically, we differentiate between mortgage- and non-mortgage debt-to-income ratios (Model 4) and also control for the extent of economic difficulties reported by household members (Model 5). This extension is aimed at providing an assessment of which of the two categories of debt is more harmful for SAH. Finally, we extend the previous specifications by adding household net wealth (W_{it}) and the amount of pending debts, D_{it} (Models 6 to 10). Therefore, we admit the possibility that being conscientious of the amount of pending debts has effects on individual health that are over and beyond the effects arising from current financial strain. The inclusion of these two variables may be regarded as redundant, since net wealth is the value of assets minus debts. However, the inclusion of these two variables is intended to test whether conditional on household wealth, individuals with larger debt amounts are exposed to worse health.

4.2 Reference groups

We test for the existence of social norm effects in the debt-health relationship. The particular social norm effect hypothesized here is the impact of social stigma arising from problem debt. The literature on the social stigma of individual indebtedness and adverse debt outcomes such as bankruptcy presents evidence that higher reference group bankruptcy rates diminish the social stigma associated with being declared bankrupt (Fay et al., 2002).

The existence of reference group effects is investigated by extending Models 1 to 10 to include the individual's reference group average value of the different measures of over-

[6] The wording of the first questions is: "*Do you believe that your savings will be higher, lower or the same as at present in the future?" 1. yes, 2. no, 3. the same, 4. don't know*. The second question is "*Do you believe that your spending will be higher, lower or the same as at present in the future?*" 1. yes, 2. no, 3. the same, 4. don't know. The two dummies introduced in the regression are activated when the respondent answered "yes".

indebtedness,

$$SAH_{it} = f\left(SAH^{*}(X, Y, P, F, D, W, \bar{P}, \bar{F}, \bar{D})\right) \quad (2)$$

where $\bar{P}, \bar{F},$ and $\bar{D}$ are the corresponding group averages.

The literature on reference group formation does not yet provide much empirical evidence or theoretical insights on how individuals form their reference group and what is the stability of those across time and domains. On one side, large-scale surveys do not contain direct questions about the composition of the reference groups and empirical results from pilot surveys or experimental evidence (Falk and Knell, 2004; Clark and Senik, 2010) are not yet directly applicable to large questionnaires. The empirical literature has typically assumed that individuals' reference group is formed by those who are similar to them. While some authors consider that comparisons take place only between those in the same cohort (McBride, 2001), others consider a larger set of individual characteristics, including education and region, for the construction of the reference groups (Ferrer-i-Carbonell, 2005).

We proceed by partitioning the sample by gender and into various age (younger than 40, 40-49, 50-59, 60-69, and 70 or older) and education (primary or less, secondary and tertiary education) groups. The regional dimension was disregarded since the EFF omits this information due to anonymity reasons. The combination of these criteria produced 30 different groups[7].

5. Estimation procedure

We take SAH to be cardinal or, in other words, that the distance between the eleven satisfaction categories carry a meaning. It has been shown that assuming cardinality as

[7] In the final sample the average number of individuals in a group ranges from a minimum of 10 to a maximum of 564. Differences in cell sizes introduce differences in the level of precision in the measurement of reference-group statistics. Since inaccuracy grows exponentially as the number of observations decreases, we were concerned with the potential prevalence of very small groups (<25 obs.). There are reasons to be optimistic. In our data, of the 30x3 = 90 group-year combinations, only 3 cases (2.2%) comprised less than 25 obs, whereas only 14 cases (15.5%) had less than 50 obs.

oppose to using ordinal models is rather irrelevant for the results in terms of trade-offs between explanatory variables (Ferrer-i-Carbonell and Frijters, 2004) while it has the advantage of yielding coefficients that can be directly interpreted as marginal effects. We adopt probit-adapted ordinary least squares (POLS) as developed by Van Praag and Ferrer-i-Carbonell (2008: 29-34). Implementing POLS begins by deriving $\{\mu_j\}_{j=0}^{J}$ values of a standard normal associated with the cumulative frequencies of the *J* different categories of the dependent variable, with $\mu_0 = -\infty$, $\mu_J = \infty$. Then the expectation of a standard normally distributed variable is taken for an interval between any two adjacent values. Thus, if the true unobserved continuous variable for individual *i* at time *t* is SAH_{it}^{*}, where the observed is $SAH_{it} = j$ if $\mu_{j-1} < SAH_{it}^{*} \leq \mu_j$, $j = 1, \ldots, J$, then the conditional expectation of the latent variable is given by:

$$S\ddot{A}H_{it} = E\left(SAH_{it}^{*} | \mu_{j-1} < SAH_{it}^{*} < \mu_j\right) = \frac{n(\mu_{j-1}) - n(\mu_j)}{N(\mu_j) - N(\mu_{j-1})} \qquad (3)$$

where *n* is the normal density and *N* is the cumulative normal distribution. This approach allows the application of a linear estimator on the conditional expectations. Abstracting from reference group effects, our estimating equation becomes:

$$SAH_{it} = \alpha X_{it} + \beta_l \bar{Y}_i + \beta_s Y_{it} + \gamma P_{it} + \delta F_{it} + \theta D_{it} + \eta W_{it} + \upsilon_i + \eta_{it} \qquad (4)$$

where η_{it} an independent error term for individual i at time t and υ_i is an individual effect that varies across individuals and is constant over time. Variable $\bar{Y}_i$ stands for the average of Y_{it} over the *T* years in the panel. The introduction of this variable is motivated by the suspicion that SAH is more likely to depend on permanent income than on transitory income. Since $\beta_l \bar{Y}_i + \beta_s Y_{it} = (\beta_l + \beta_s)\bar{Y}_i + \beta_s \Delta Y_{it}$, where ΔY_{it} is the variation relative to the average across time, this refinement allows us to assess how changes in family income affect SAH depending on whether they are permanent $(\beta_l + \beta_s)$ or transitory (β_s). The income variables and the amount of pending debts are entered in their logarithmic form. Household wealth is categorized in quintiles.

We adopt a random effects model (RE) with a Mundlak term. Fixed effects models can account for the unmeasured time-invariant confounders described so far. However, they preclude the researcher from obtaining reliable estimates on characteristics that have

zero or low within-person variation, leaving no room for uncovering declines in individual health that may simply arise, for example, from being in a permanently serious state of over-indebtedness[8]. Therefore, our preference for an extended RE model can be seen as a working compromise to, on the one hand, control for time-invariant unobservables and, on the other hand, use both within and between individual information. The implicit assumption of RE models that the random component ν_i is uncorrelated with the explanatory variables is questionable, insofar as the dependent as well as the right-hand-side variables may be driven by omitted characteristics: for example, healthy individuals may be more likely to marry and form larger households and be more successful in life than others. The Mundlak term is intended to control for such correlations. It consists of a vector $\bar{X}_i^M$ with the time-averaged values of a subset of M explanatory variables. With this strategy the unobserved heterogeneity of the standard RE model is assumed to consist of two parts, $\nu_i = u_i + \lambda \bar{X}_i^M$. The first part is a pure-error term. The second part is assumed to vary linearly with the within-group means. Thus, Eq. (4) becomes:

$$SAH_{it} = \alpha X_{it} + \beta_l \bar{Y}_i + \beta_s Y_{it} + \gamma P_{it} + \delta F_{it} + \theta D_{it} + \eta W_{it} + \lambda \bar{X}_i^M + u_i + \eta_{it} \quad (5)$$

with $u_i \sim N(0, \sigma_u^2), \eta_{it} \sim N(0,1)$, $Cov(u_i, \eta_{it}) = 0$. The Mundlak variables were chosen to be: time averaged values of the individual education level, and number of household members.[9]

6. Results

6.1 Descriptive analysis

Table 1 provides information on the composition and evolution of household's debts. These are classified between mortgage and non-mortgage debts. The first group comprises three categories (main real state, other properties and other mortgages), while

[8] In our sample, the between-waves average rates of variation of household assets and debts are 4.4% and 8.7% respectively, while only 13.8% of the sample individuals see their asset and debt stocks change by more than one-standard deviation across two consecutive waves.

[9] We call attention to the average income level $\bar{Y}_i$ included in the regression, which can be regarded as part of the Mundlak term. However, for expositional purposes, we prefer to maintain a separate notation. Given its potential correlation with SAH, the proportion of years in employment during the observation period was also included as an additional Mundlak term in the earlier stages of the paper. This variable failed to be statistically significant in most specifications and was therefore dropped.

the second group includes five (main real state, other properties, other secured loans, personal loans and others)[10].

After eliminating households with missing information in the variables of interest, we end up with 3868, 4166 and 4201 observations in 2002, 2005 and 2008 respectively. Over 40% of households were in debt in 2002, with mortgage debts being more prevalent than non-mortgage debts (26.6% and 22.3% respectively)[11]. Main real state debts account for the largest share of mortgage debts (18.3%), while personal loans are the most important component of non-mortgage debts (17.1%). With regard to the evolution of the percentage of indebted households, we observe a significantly increase between 2002 and 2005, from 41.0% to 53.1%, and a slight decrease – down to 51.9% – from 2005 to 2008. The increasing trend in the first period affects both mortgage and non-mortgage debts. The increase is not only observed among main real state debts but also to other properties and other mortgages. Personal loans are behind the upward trend in non-mortgage debt.

[Table 1 here]

To better describe the extent of debt burden among households, we compute debt payment-to-income ratios. The results are reported in Table 2. For computation of the resulting averages we only consider indebted households. The number of indebted households within each debt category is reported below the heading "N" in the table. We find that the risk of over-indebtedness was already high in 2002, when the debt-to-income ratio was above 36%. Nonetheless, this figure worsened dramatically in only 3 years. In 2005 the amount of debt payments in relation to income was 49%, a figure that is suggestive of the financial fragility that already threatened Spanish households before the start of the current economic crisis.

[Table 2 here]

Household indebtedness is not only determined by the share of income spent on debt payment, but also by the amount of outstanding debts. In the bottom part of Table 2 we report the averages for different debt categories. These averages refer only to indebted

[10] For a description of the patterns of various types of debts in a variety of European countries using harmonized data, see Bover et al. (2014).

[11] The two types of debt are not mutually exclusive, that is, there are households with both types of debts.

individuals. Average outstanding debts increased by 85% between 2002 and 2008, from €53,674.2 to €99,487.7.

This trend was parallel to a remarkable increase in asset holdings over the 2002-2008 period, as shown in Table 3. In 2008 assets amounted to €1,121,527, more than twice of the 2002 figure. "Other real state properties" (not including the home) and "portfolio investment institutions" are, by far, the ones that have experienced the sharpest increase over the sample years (150.2% and 166.6% respectively). In the first case, the increase is accompanied by a higher number of households owning this type of assets (a 26% increase, from 1,682 in 2002 to 2,119 in 2008). In contrast, the number of households with portfolio investments decreased by more than 15% (from 612 to 517), in spite of the huge increment in the average value of this type of assets.

[Table 3 here]

Finally, in order to provide a first insight on the debt-health relationship, Table 4 shows the health distribution. The left column considers only indebted households, while the right column refers to the sample as a whole. In all years, the share of households reporting "very good" and "good" health tends to be higher among indebted households than in the total sample. This observation suggests that the negative relation between health and debt is not apparent in the raw data. To facilitate the comparison between samples and across years, in the last row we report the average health level in the 1-5 scale ('5- very good', '1-very poor'). The average score is around 4.0, slightly lower among indebted households, and sensitively higher in 2002 than in 2005 and 2008.

[Table 4 here]

6.2 The determinants of health

Table 5 reports the estimation results. The first column (Model 1) shows that conditional on a full vector of socioeconomic characteristics, households with a higher debt-to-income ratio exhibit worse health. The estimate indicates that a 1-unit increase in the ratio (going from null debt payments to spending the monthly income totally in debt payments) decreases the SAH score by 0.10 points. Although the estimate is significant at conventional levels, this effect can be regarded as small insofar as a 1-unit variation is a big move in terms of household indebtedness. The next column (Model 2) shows that debt arrears are more important for SAH than payment-to-income ratios.

Ceteris paribus, households that delay debt payments see their SAH scores decreased by 0.21 points, a value that more than doubles the previous effect. It is interesting to note that when both objective and subjective measures of indebtedness are included in the regression (Model 3) the coefficient of the debt-to-income decreases and becomes non-significant. In contrast, the coefficient associated with the inability to meet payment requirements does not change and is, again, significant.

Differentiating between mortgage and non-mortgage debt (Model 4) sheds further light on the debt-health relationship. While the mortgage debt-to-income ratio is not significantly related to SAH, a higher non-mortgage-to-income ratio significantly harms health (-0.20). This suggests that the negative effect of monthly debt payments on health displayed by Model 1 is mostly due to non-mortgage debt payments. By the results from Model 3 one may be inclined to believe that debt payments do not impose a significant burden on health as long as individuals can keep up with the payments. However, the last specification (Model 5) suggests that this may be not the case. Although the effect is significant only at the 10% level, we find that the non-mortgage debt payments-to-income ratio decreases significantly an individual's health even after controlling for his ability to meet monthly payments.

To gauge the magnitude of these effects, in the following we inspect the relationship between SAH and the full set of socioeconomic characteristics. We find that, regardless of the specification, transitory income is not significantly related to health, whereas permanent income is health-protective. This result is common across specifications and consistent with previous findings in the literature (Benzeval and Judge, 2001, Martikainen et al., 2003, Aittomäki et al., 2010). This is so because health is more influenced by long-term accumulation of economic resources than by monetary circumstances at a certain point of time. Long term income makes life easier more generally, reducing stress and wear and tear, for example by having help to look after the children, reducing overtime work or by having the money to buy first class travel.

According to the estimates from Model 5, a one-unit increase in logarithmic permanent income (a raise by a factor of exp(1) = 2.71 in absolute income) raises SAH by some 0.11 points. This effect is similar, but of opposite sign, to the effect of raising the payment-to-income ratio by one unit (-0.13), whereas failing to keep up with the household's debt payments more than offsets (-0.20) the health benefits of such increase

in people's income. These comparisons are suggestive of the importance of over-indebtedness for SAH determination.

The effect of the remaining variables is as follows. Gender is significantly related to SAH, with women reporting better health. As expected, health deteriorates with age, although at a decreasing rate. Relative to married individuals, the divorced and the singles are significantly worse off. The employment dimension is one of the most important determinants of SAH. Wage earners, the self-employed and even the unemployed report better health than the reference group, inactive individuals. The effect is particularly large for the first two employment categories. Individuals with an university education and, to a lesser extent, secondary education enjoy better health than individuals with primary education or less. This finding is consistent with the fact that education makes it easier to use and benefit from new health information and technologies. All in all, these results are not novel for the connoisseur of the literature. Inspection of Table 5 shows that these patterns change little across specification and, therefore, will not deserve further attention henceforth. Finally, individuals who believe that their savings will be higher in the future than at present report higher SAH, whereas prospects of higher spending are innocuous for SAH determination.

[Table 5 here]

6.3 Health, wealth and outstanding debt amounts

Next we move on to consider quintiles of wealth and amounts of outstanding debts as determinants of health. In all specifications (Models 6 to 10), wealth is closely related to health. It is important to stress that controlling for wealth does not alter substantially the coefficients of the full set of socio-economic indicators reported in the bottom part of Table 5, relative to Models 1 to 5. This suggests that the effect of wealth on SAH is over and beyond the role of other important factors such as gender, age, employment status and education. Taking Model 6 as a reference, we find that relative to an individual in the bottom quintile of the wealth distribution (the reference individual), an individual in the 2nd quintile has significantly better health (0.09). This effect almost doubles (0.17) if the individual is in the 4th quintile and almost triples (0.24) if the individual is at the top 20% of the wealth distribution. These estimates, which change little across Models 6 to 10, are remarkably large if we compare them to the coefficients of other socio-economic characteristics, including marital status, employment situation

and one of the best explanatory factors of health differences and life expectancy worldwide: gender. A switch from the bottom to the top quintile of the wealth distribution raises SAH by as much as 0.24 points. In contrast, the SAH differential between genders is only 0.04 points, ceteris paribus. Differences among married and single individuals are not much larger (0.10), while the health gap between inactive individuals and wage earners amounts to 0.20 points. Similarly, university education, a factor typically associated to healthy behaviors and health consciousness, is associated with a 0.18 points increase of SAH, relative to primary education or less. All in all, these results suggest that wealth is a major determinant of health. This pattern is typically overlooked by surveys and studies based on income data. The stronger and more robust effect of wealth than income suggests that long-term accumulation of economic resources is highly relevant. We may hypothesize that relative to the less wealthy, the wealth-rich follow healthier life styles, even assuming similar income, perhaps due to a greater command over resources and freedom to spend on whatever is deemed desirable or necessary.

One of the most remarkable findings from Models 6 to 10 is that, for a given household wealth, outstanding debts exert negative effect on SAH. Taking again Model 6 as a reference, we find that a 1 unit increase in the logarithm of households debt (i.e., a raise by a factor of 2.71 in the amount of outstanding debts) decreases SAH by 0.01 points. Although arguably small, the effect is statistically significant. A related finding is that after including controls for wealth and outstanding debts, the effect of the debt-to-income ratio (negative and significant in Model 1) becomes non-significant. This result puts into question previous studies reporting detrimental health effects of over-indebtedness as measured by debt-to-income ratios. In contrast, the individual's subjective appraisal of his inability to keep up with debt payments is significantly related to SAH even after controlling for wealth and debt amounts (Model 7). In other words, conditional on the household’s wealth and outstanding debts, having fallen in arrears in the recent past affects SAH negatively. This result suggests that the channels by which debt affects health are over and beyond the mere effects of the household’s current affluence.

To provide a more detailed view, Models 9 and 10 differentiate between mortgage and non-mortgage debts. Outstanding debts have negative effects on SAH if they are non-mortgage debts. Mortgage debts are largely innocuous in terms of SAH. This result is at

odds with Keese y Schmitz (2014) and Lau and Leung (2011), who show that more indebtedness is associated with poorer health outcomes. Nonetheless, Lau and Leung (2011) focus only on mortgage debts, disregarding other types of debts. Inspection of the debt payments-to-income ratios shows, again, that these variables fail to be statistically significant once we control for outstanding debt amounts. This result supports the notion that monthly debt payments are imperfect indicators of the extent of household financial strain and its impact on health. In this line, Model 10 shows that the negative relationship between debt arrears and SAH is over and beyond the effects of the current economic condition of the household (income, wealth, outstanding debts and debt-to-income ratios).

6.4 Social norm effects

The existence of reference group effects is investigated by extending Models 1 to 10 to include the individual's reference group average value of the different measures of over-indebtedness. The first column in Table 6, for instance, shows that a higher debt-to-income ratio of the individual's reference group is associated with higher SAH. However, the coefficient fails to be statistically significant at conventional levels. This pattern holds even after differentiating between mortgage and non-mortgage debts (Models 4 and 5). In contrast, a higher proportion of individuals with debt arrears within one's reference group has significant positive effects on SAH (Model 2). This result is ceteris paribus, i.e., conditional on the individual's economic condition, and suggests that feelings of anxiety and worry caused by problems of debt payments are lessened, through peer group effects, when debt problem is more prevalent among the relevant others. This effect holds even after controlling for the average debt payment-to-income ratio in one's reference group (Model 3).

In a similar setting, Gathergood (2012) shows that the psychological impact of problem debt, both mortgage debt and consumer credit debt, is less severe for individuals who live in localities in which problem debt is more widespread. His social norm effects are based on the prevailing local housing repossession rate and the personal insolvency rate. He finds that individuals experiencing the onset of mortgage arrears in regions in which mortgage arrears are more prevalent see less deterioration in their psychological health scores compared with individuals who exhibit an onset of mortgage arrears in regions with lower mortgage arrears rates. The same occurs when the local bankruptcy rate is

used. Our results are broadly consistent with these findings and alert that overall health, not just psychological well-being is sensitive to social norm effects.

[Table 6 here]

7. Discussion

A key issue is whether poor health status is the result of being indebted or whether it is a determinant of observed debt outcomes. It is likely that debt both causes ill-health and is caused by it through the effects of ill-health on labour market status and thus on ability to service debt. Healthy people can work longer hours and take fewer sick leaves, and are more productive and more likely to maintain their job than unhealthy people. These superior conditions favour the accumulation of wealth and may create a reverse causality problem. A natural extension to address this concern is an IV approach that unveils the true impact of debt on health. This strategy has been followed in papers concerned with the income-health relationship (Theodossiou and Zangelidis, 2009, Blázquez et al., 2014).

Unfortunately, this road is closed to us. The EFF contains two questions potentially related to household debt holdings. The first one refers to inheritances in the form of income, real state properties, jewellery, antiques and works of art, among others. The second information is a self-reported measure of an individual's attitudes towards risk. In computations not reported here we used this information to instrument, alternatively, the debt-to-income ratio and the incidence of debt arrears. Households receiving larger inheritances and less willing to accept financial risks were found to be significantly less indebted. However, the correlation was weak, a problem that exacerbates the bias arising from the potential correlation between the endogenous variable (SAH) and the instruments. Moreover, the instruments failed to be valid, i.e., uncorrelated with SAH, and the Durbin-Wu-Hausman rejected the endogeneity of the instrumented variable[12].

[12] Instrumenting the debt-to-income ratio: F-test for excluded instruments = 3.47 (p-value = 0.03); Sargan statistic of orthogonality = 4.56 (p-value = 0.53); Endogeneity test = 1.48 (p-value = 0.22). Instrumenting the incidence of debt arrears: F-test = 16.57 (p-value = 0.00); Sargan statistic = 1.19 (p-value = 0.28); Endogeneity test = 0.51 (p-value = 0.47).

One avenue of exploration remains open. To address reverse causality concerns, we establish estimates for two population groups (Tables 7 and 8). Changes in household composition, including the loss of the household breadwinner and household split-ups, result in severe income losses and adverse health shocks. This channel is blocked by our first sub-sample, comprising respondents who were married throughout the entire period under consideration. The second sub-sample is composed by individuals employed full-time between 2002 and 2008. Since individuals may become unemployed or out of the labor force due to an adverse health shock and, consequently, get into trouble repaying their debts, we exclude individuals who at some time were unemployed or inactive. This restriction rules out the possibility that financial troubles and health declines are a consequence of job loss.

The results, in line with our earlier findings, indicate that none of these channels are the driving force behind the observed impact of over-indebtedness on SAH. In line with the benchmark specification, married individuals with higher debt-to-income ratios tend to be worse off, especially when their monthly payments are due to non-mortgage debts (Table 7). Ceteris paribus, households that delay debt payments see, again, their SAH scores decreased. Similarly, failing to keep up with debt payments decreases SAH even after controlling for wealth and debt amounts, like in the benchmark specification.

The results from employed individuals are also in line with the benchmark estimates. This notwithstanding, some minor changes are apparent. First, the effect of debt arrears is somewhat lower than in the benchmark specification (-0.21 against -0.15, Model 2), although still significant at conventional levels. Second, the negative association between outstanding non-mortgage debts and SAH is significant only at the 10% level. Even though this loss of significance may be due to smaller sample size, we cannot preclude the possibility that the effect of debt on SAH differs among socio-economic groups. Third, wealth is relatively less relevant for SAH determination among employed individuals than in the full sample. It is likely that in the former group working conditions, which we cannot observe, are an important dimension of a worker's health.

7.1 Changes in reference groups

Although the combination of the different criteria outlined above is fairly rich by common standards, the approach is an exogenous one. The sensitivity of the estimates to changes in the definition of reference groups and variations in the level of

aggregation within specific dimensions were explored. This included enlarging the number of age intervals to 16 (resulting in 96 reference groups). These alternative approaches were discarded as the paper's benchmark definition of groups due to substantially smaller cell sizes. The estimates are not reported here for reasons of space. A common finding was that social norm effects are reasonably stable to the definition of the reference groups, the corresponding coefficients changing by less than 20% when going from the benchmark approach to the more detailed classifications. In all cases the proportion of individuals with debt arrears within one's reference group was found to significantly affect SAH. Similarly, no social norm effects were detected in terms of the debt-to-income ratio.

7.2 Gender differences

Despite the efforts that modern societies have undertaken in the field of gender equality, women today still encounter special difficulties due to the differential roles they have been traditionally awarded. Relative to men, women are at higher risks of financial strain due to their position in the labor force, family role, and lower earnings[13]. Not only women are overrepresented among those living in poverty and earning lower wages, but they are also more likely than men to be single heads of household and to carry the responsibility for raising children with fewer economic resources (U.S. Census Bureau, 2006). Thus, financial strain and debt burden may be especially consequential to women's health (Groh, 2007).

Furthermore, a higher prevalence of depression among women than men is one of the most widely documented findings in psychiatric epidemiology. One explanation could be that the chronic stresses associated with traditional female roles lead to a higher prevalence of depression among women than men (Mirowsky and Ross, 1989). An alternative explanation stems from the fact that women are more likely than men to dwell on problems and, because of this, to let transient negative emotions grow into clinically significant episodes of depression (Nolen-Hoeksema 1990). The evidence of such gender differences suggests the necessity to pay special attention to studying the relationship between over-indebtedness and health among women, inasmuch debt burden may affect their health status in ways that are distinct from men.

[13] See, for example Budría and Giménez (2007) for an examination of the wealth, income and earnings distributions in Spain and the US and the importance of gender and family composition.

We carried out separate estimations for men and women in order to assess whether different patterns between males and females are observed in the debt-health relationship. The results, available upon request, confirm that arrears of debt payments exert a negative impact on individual's health. This is observed for both males and females, and the effect remains significant even when wealth and outstanding debts are included as explanatory variables. However, debt-to-income ratios were found to be slightly more relevant in explaining women's health status than men's, and the difference was significant. This finding suggest far-reaching negative effects of indebtedness on health among females and provide evidence of gender differences in the debt-health relationship, a result that is in line with previous evidence. For instance, Averett and Smith (2014) show that women are more likely to be overweight when they have trouble paying bills, while no effects are observed among men. Finally, we tested for differences in social norm effects among men and women. In both samples the pattern was similar, with a higher prevalence of debt arrears in one's reference group protecting one's health.

8. Conclusions

The current economic crisis, which began in 2008, has triggered concerns that a substantial and growing number of households are facing severe debt-related financial difficulties, with important consequences in terms of individual's health. The cost of depression alone in the European Economic Area has been estimated at €136,3 billion, of which around one third falls on the health care system (McDaid et al., 2008). Therefore, a better knowledge of which factors cause most damage to individuals' health is necessary to reduce the non-negligible costs imposed not only on citizens but onto the economy as a whole.

Using longitudinal data extracted from the Spanish Survey of Household Finances, this paper showed that hard-up people struggling to pay their debts are more likely to report health problems. When distinguishing between mortgage and non-mortgage debts we found that the latest exert the most dramatic impact on individual's health. We also found a evidence of social norm effects.

The results have different policy implications. First, by indentifying which forms of debt are more health-damaging, the paper provides useful information to practitioners in

the field and policy makers. Attention should be given to households with debt arrears and with large pending amounts of non-mortgage debts. Income is typically highlighted as one of the most important indicators of affluence and, therefore, regarded as health-protective. The results in this paper suggest that debts can be more important than income. Specifically, we found evidence that the beneficial effects of seeing one's household income rise by a factor of almost 3 would be more than offset if the individuals fails to keep up with the household's debt payments.

Second, the negative health effects of over-indebtedness suggest the necessity that policy makers devote more efforts to prevent households from entering a precarious debt situation. For instance measures aimed at improving financial literacy at early stages, with special focus to debt literacy, or policy initiatives to fund debt counseling agencies that support household affected by financial problems to reschedule debt payments could serve to prevent the negative health consequences of over-indebtedness. Besides, it is important to highlight that better financial literacy skills could contribute to improved household's financial decision making, which could, in turn, have positive effects not only on households but also on economic and financial stability more generally (OECD, 2009). Financial education has been pointed out as one of the key elements to reduce over-indebtedness. This is supported by evidence suggesting that individuals with lower financial knowledge are more likely to make financial mistakes (Benjamin et al., 2013). For instance, households with low levels of financial literacy borrow at higher interest rates (Stango and Zinman, 2009), are less likely to have savings (Smith et al., 2010), and are more likely to default on mortgage payments (Gerardi et al., 2013). Since 2010 Spain has launched several pilot projects in order to introduce financial education in schools[14] with the purpose of improving financial skills among youths. Nonetheless, the recent PISA report on financial literacy[15] reveals that Spain's performance is below the average of the 13 OECD countries that participated in the assessment.

[14] The so-called Financial Education Plan (*Plan de Educación Financiera*), available at: http://www.cnmv.es/DocPortal/Publicaciones/PlanEducacion/PlanEducacion13_17.pdf

[15] Available at: http://www.oecd.org/pisa/keyfindings/PISA-2012-results-volume-vi.pdf

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Tables

Table 1: Share of households with outstanding debts (%)

	2002	2005	2008
Total	41.0	53.1	51.9
Mortgage	26.6	36.6	35.9
Main real state	18.3	24.2	24.9
Other properties	7.3	11.0	10.9
Other mortgages	2.5	4.4	2.8
Non-mortgage	22.3	29.2	28.8
Main real state	2.0	1.1	1.0
Other properties	1.5	1.6	1.5
Other secured loans	0.7	0.5	0.8
Personal loans	17.1	23.3	21.4
Others (credit line, deferred payment..)	2.7	5.5	9.0

Table 2: Average income, debt payments-to-income ratio and debts

	2002		2005		2008	
	Mean	**N**	**Mean**	**N**	**Mean**	**N**
Income	33102.9	3868	36579.2	4166	34411.5	4201
Debt/Income	0.36	1584	0.49	2212	0.49	2179
Mortgage/Income	0.30	1028	0.41	1523	0.42	1506
Non-mortgage/Income	0.30	861	0.37	1216	0.36	1211
Total Outstanding Debts	53674.3	1584	79842.7	2212	99487.7	2179
Mortgage	64000.6	1028	91635.8	1523	114607.6	1506
Main real state	51849.6	708	70639.7	1010	79633.4	1047
Other properties	79946.6	281	112954.0	460	157321.3	457
Other mortgages	69664.2	95	88368.7	184	145898.8	119
Non-mortgage	22331.5	861	30459.7	1216	36473.6	1211
Main real state	13763.7	79	27353.3	46	33028.4	40
Other properties	40488.4	56	65235.9	67	90471.3	63
Other secured loans	83998.45	26	68927.5	19	87469.94	33
Personal loans	15217.91	661	24026.4	972	31099.15	899
Others (credit line, deferred payment..)	34242.95	106	29461.4	229	16766.17	376

Note to Table 2: 'N' denotes the number of individuals with positive debt amounts in the corresponding category.

Table 3: Average asset holdings

	2002		2005		2008	
	Mean	N	Mean	N	Mean	N
Total Assets	476766.4	3868	742378	4166	1121928.0	4201
Value of the business	.	0	.	0	1280286.0	903
Other real state properties	292803.4	1682	484724.0	2043	732586.3	2119
Jewellery,works of arts.	24323.5	895	36406.7	1103	28055.9	1041
Accounts used to make payments	8988.9	3805	17361.7	3936	17655.9	3982
Portfolio of listed shares	121150.5	839	147372.0	934	164716.3	932
Portfolio of unlisted shares	1152517.0	310	1453653.0	301	1088268.0	180
Portfolio of fixed-income securities	54867.09	122	68664.4	102	100945.3	124
Porfolio (Investment institutions)	99270.43	612	179464.0	739	264683.9	517
Saving accounts and accounts not used to make payments	63577.7	889	59849.0	946	99931.7	1253
Pensions schemes	30518.9	1255	37962.8	1717	39710.1	1664
Life insurances	90834.7	80	114196.0	112	138292.0	95
Other assests	46013.6	181	38644.7	199	96306.9	391
Value of your home	200876.5	3280	323155.0	3518	318099.7	3630
Additional assets (managed accounts)	.	0	.	0	220634.5	44

Notes to Table 3: Some small changes were introduced in the 2008 wave. Firstly, equity in privately held businesses is determined independently for self-employment status in the 2008 wave ("Value of the Business"). Secondly, the 2008 wave includes questions about ownership of managed accounts regarding assets not included in the specific asset categories ("Additional assets (managed accounts)").

Table 4: Population shares (%) by health status (Total and indebted households)

	2002		2005		2008	
Health	Indebted hh	All hh	Indebted hh	All hh	Indebted hh	All hh
1-Very good	22.6	17.9	29.8	26.6	24.5	22.7
2-Good	61.1	60.1	52.9	52.8	60.4	58.1
3-Acceptable	11.1	16.0	12.6	15.0	12.0	14.7
4-Poor	4.4	5.2	4.1	5.0	2.8	4.1
5-Very poor	0.8	0.8	0.6	0.6	0.4	0.5
Average score (1-5)	4.00	3.90	4.07	4.00	4.06	3.98

Table 5: Over-indebtedness and health (RE estimations with Mundlank)

	M 1		M 2		M 3		M 4		M 5		M 6		M 7		M 8		M 9		M 10	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Average (Log(Income))	0.12	4.95	0.11	4.78	0.11	4.79	0.11	4.89	0.11	4.76	0.09	3.75	0.09	3.68	0.09	3.66	0.09	3.71	0.08	3.63
Log(Income)	0.01	0.36	0.01	0.32	0.01	0.37	0.01	0.33	0.01	0.35	0.00	0.21	0.01	0.50	0.00	0.22	0.01	0.28	0.01	0.31
Debt-to-income ratios																				
Debt/income	-0.10	-2.10			-0.05	-1.15					-0.10	-1.30			-0.13	-1.70				
Mortgage/income							-0.04	-0.70	-0.01	-0.27							-0.05	-0.49	-0.07	-0.67
Nomortgage/income							-0.20	-2.75	-0.13	-1.68							-0.09	-0.74	-0.13	-1.06
Debt arrears			-0.21	-6.06	-0.21	-5.83			-0.20	-5.67			-0.18	-4.97	-0.18	-5.08			-0.18	-4.94
Wealth and debt amounts																				
q2											0.09	3.70	0.08	3.32	0.08	3.27	0.09	3.59	0.08	3.21
q3											0.15	6.17	0.14	5.67	0.14	5.62	0.15	6.00	0.14	5.52
q4											0.17	6.52	0.16	6.01	0.16	5.98	0.17	6.34	0.16	5.87
q5											0.24	7.28	0.23	6.94	0.22	6.88	0.23	7.10	0.22	6.77
Log(total debt)											-0.01	-3.08	-0.00	-2.60	-0.01	-2.96				
Log(mortgage)																	-0.00	-1.13	-0.00	-1.09
Log(nomortgage)																	-0.01	-2.54	-0.01	-2.27
Household size	0.03	1.52	0.03	1.51	0.03	1.55	0.03	1.52	0.03	1.55	0.03	1.38	0.03	1.49	0.03	1.41	0.03	1.38	0.03	1.42
Female	0.04	2.39	0.04	2.41	0.04	2.41	0.04	2.37	0.04	2.40	0.04	2.32	0.04	2.36	0.04	2.36	0.04	2.28	0.04	2.33
Log(age)	-2.87	-2.63	-2.85	-2.61	-2.85	-2.61	-2.81	-2.56	-2.80	-2.57	-3.41	-3.11	-3.38	-3.09	-3.33	-3.05	-3.41	-3.11	-3.35	-3.06
Log(age)^2	0.25	1.75	0.24	1.73	0.24	1.72	0.24	1.69	0.24	1.68	0.30	2.14	0.30	2.11	0.29	2.07	0.30	2.14	0.29	2.09
Separated	-0.11	-3.20	-0.10	-2.70	-0.10	-2.73	-0.11	-3.17	-0.10	-2.72	-0.09	-2.57	-0.08	-2.27	-0.08	-2.21	-0.09	-2.56	-0.08	-2.22
Single	-0.11	-4.86	-0.10	-4.72	-0.11	-4.78	-0.11	-4.84	-0.10	-4.77	-0.10	-4.75	-0.10	-4.77	-0.10	-4.70	-0.10	-4.75	-0.10	-4.70
Wage earners	0.18	7.78	0.18	7.67	0.18	7.70	0.18	7.76	0.18	7.69	0.20	8.41	0.20	8.30	0.20	8.31	0.20	8.36	0.19	8.27
Self-employed	0.18	6.79	0.17	6.64	0.17	6.67	0.18	6.77	0.17	6.67	0.16	6.16	0.16	6.11	0.16	6.07	0.16	6.13	0.16	6.05
Unemployed	0.08	2.23	0.10	2.57	0.10	2.56	0.09	2.26	0.10	2.57	0.10	2.56	0.11	2.83	0.11	2.83	0.10	2.55	0.11	2.81
Secondary	0.08	2.48	0.08	2.50	0.08	2.51	0.08	2.49	0.08	2.52	0.07	2.25	0.08	2.30	0.07	2.29	0.07	2.28	0.08	2.31
Tertiary	0.19	4.10	0.19	4.12	0.19	4.12	0.19	4.11	0.19	4.12	0.18	3.82	0.18	3.84	0.18	3.84	0.18	3.83	0.18	3.85
Expenses high	-0.01	-0.80	-0.01	-0.60	-0.01	-0.60	-0.01	-0.79	-0.01	-0.60	-0.01	-0.59	-0.01	-0.43	-0.01	-0.42	-0.01	-0.60	-0.01	-0.43
Savings high	0.04	1.98	0.04	2.09	0.04	2.15	0.04	1.99	0.04	2.16	0.04	1.88	0.04	2.05	0.04	2.03	0.04	1.88	0.04	2.02
Constant	5.73	2.72	5.74	2.73	5.76	2.74	5.61	2.66	5.67	2.70	7.29	3.45	7.32	3.47	7.18	3.40	7.29	3.45	7.24	3.43
sigma_u	0.39		0.38		0.38		0.39		0.38		0.38		0.38		0.38		0.38		0.38	
sigma_e	0.72		0.72		0.72		0.72		0.72		0.72		0.72		0.72		0.72		0.72	
rho	0.22		0.22		0.22		0.22		0.22		0.22		0.22		0.22		0.22		0.22	
No. of observations	13480		13480		13480		13480		13480		13480		13480		13480		13480		13480	

Notes to Table 5: i) Source: EFF 2002-2005-2008; ii) Yearly dummies and Mundlak term included in the estimations; ii) Reference individual: an employed, wage earner, married man, with primary education or less and prospects of similar or lower expenses and savings in the future, located in the first quintile of the wealth distribution (Models 6 to 10) and with average values in the remaining (continuous) variables.

Table 6: Over-indebtedness and health (The effect of social comparisons)																				
	M 1		M 2		M 3		M 4		M 5		M 6		M 7		M 8		M 9		M 10	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Reference group debt-to-income ratios																				
Debt/income	0.09	0.79			0.01	0.06					0.13	1.04			0.04	0.29				
Mortgage/income							-0.01	-0.08	-0.09	-0.47							0.03	0.30	0.05	0.43
Nomortgage/income							0.14	0.91	0.08	0.49							0.10	0.82	0.14	1.11
Group debt arrears			0.63	2.29	0.62	2.03			0.63	2.06			-0.70	-2.37	-0.64	-2.02			-0.65	-2.04
Group debt amounts																				
Log(total debt)											0.02	1.51	0.02	1.71	0.02	1.74				
Log(mortgage)																	0.02	1.33	0.02	1.48
Log(nomortgage)																	0.00	0.32	0.00	0.41
No. of observations	13480		13480		13480		13480		13480		13480		13480		13480		13480		13480	

Notes to Table 6: i) Source: EFF 2002-2005-2008; ii) Yearly dummies and Mundlak term included in the estimations; iii) Additional controls: permanent and transitory income, age, marital status, education, employment status, household size, prospects of high savings and spending in the future, and year dummies. iv) Reference individual: an employed, wage earner, married man, with primary education or less and prospects of similar or lower expenses and savings in the future, located in the first quintile of the wealth distribution (Models 6 to 10) and with average values in the remaining (continuous) variables.

Table 7: Over-indebtedness and health (RE estimations with Mundlank) - Always married																				
	M 1		M 2		M 3		M 4		M 5		M 6		M 7		M 8		M 9		M 10	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Average (Log(Income))	0.12	4.08	0.11	3.97	0.11	3.98	0.11	4.05	0.11	3.96	0.08	2.96	0.08	2.92	0.08	2.90	0.08	2.93	0.08	2.96
Log(Income)	0.01	0.51	0.01	0.46	0.01	0.53	0.01	0.50	0.01	0.52	0.01	0.36	0.01	0.36	0.01	0.36	0.01	0.45	0.01	0.48
Debt-to-income ratios																				
Debt/income	-0.12	-2.25			-0.09	-1.53					-0.08	-0.92			-0.11	-1.28				
Mortgage/income							-0.09	-1.46	-0.07	-1.08							-0.02	-0.21	-0.01	-0.06
Nomortgage/income							-0.17	-1.97	-0.13	-1.23							0.13	0.94	0.17	1.17
Debt arrears			-0.21	-4.52	-0.20	-4.25			-0.20	-4.20			-0.16	-3.54	-0.17	-3.64			-0.17	-3.55
Wealth and debt amounts																				
q2											0.09	2.70	0.08	2.43	0.08	2.42	0.08	2.67	0.08	2.42
q3											0.17	5.35	0.16	4.97	0.16	4.94	0.16	5.29	0.16	4.91
q4											0.17	5.03	0.16	4.63	0.16	4.61	0.16	4.94	0.16	4.57
q5											0.28	6.78	0.26	6.49	0.26	6.43	0.27	6.69	0.26	6.39
Log(total debt)											-0.01	-2.74	-0.01	-2.75	-0.01	-2.74				
Log(mortgage)																	-0.00	-0.79	-0.00	-0.74
Log(nomortgage)																	-0.01	-2.30	-0.01	-2.15
No.of observations	9438		9438		9438		9438		9438		9438		9438		9438		9438		9438	

Notes to Table 7: i) Source: EFF 2002-2005-2008; ii) Yearly dummies and Mundlak term included in the estimations; iii) Additional controls: age, employment status, education, household size, prospects of high savings and spending in the future, and year dummies. iv) Reference individual: an employed, wage earner, married man, with primary education or less and prospects of similar or lower expenses and savings in the future, located in the first quintile of the wealth distribution (Models 6 to 10) and with average values in the remaining (continuous) variables.

Table 8: Over-indebtedness and health (RE estimations with Mundlank) - Always employed

	M 1		M 2		M 3		M 4		M 5		M 6		M 7		M 8		M 9		M 10	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Average (Log(Income))	0.11	3.24	0.10	3.09	0.11	3.15	0.11	3.21	0.11	3.19	0.10	2.82	0.10	2.82	0.09	2.77	0.10	2.78	0.10	2.78
Log(Income)	0.03	0.94	0.02	0.79	0.03	0.92	0.03	0.93	0.03	0.99	0.03	0.90	0.03	0.90	0.03	0.88	0.03	0.98	0.03	0.98
Debt-to-income ratios																				
Debt/income	-0.12	-2.04			-0.09	-1.56					-0.05	-0.61			-0.04	-0.38				
Mortgage/income							-0.09	-1.35	-0.07	-1.07							-0.19	-1.55	-0.19	-1.55
Nomortgage/income							-0.18	-1.82	-0.13	-1.35							0.07	0.44	0.07	0.44
Debt arrears			-0.15	-2.95	-0.14	-2.70			-0.14	-2.65			-0.13	-2.46	-0.12	-2.43			-0.12	-2.35
Wealth and debt amounts																				
q2											-0.01	-0.28	-0.02	-0.46	-0.02	-0.44	-0.02	-0.44	-0.02	-0.59
q3											0.08	2.15	0.07	1.85	0.07	1.86	0.07	1.96	0.07	1.70
q4											0.06	1.57	0.05	1.26	0.05	1.26	0.05	1.38	0.05	1.11
q5											0.10	2.08	0.09	1.82	0.09	1.83	0.09	1.90	0.08	1.69
Log(total debt)											-0.00	-0.73	-0.00	-1.56	-0.00	-0.69				
Log(mortgage)																	-0.00	-0.98	-0.00	-1.04
Log(nomortgage)																	-0.01	-1.82	-0.01	-1.67
No.of observations	5974		5974		5974		5974		5974		5974		5974		5974		5974		5974	

Notes to Table 7: i) Source: EFF 2002-2005-2008; ii) Yearly dummies and Mundlak term included in the estimations; iii) Additional controls: age, marital status, education, household size, prospects of high savings and spending in the future, and year dummies. iv) Reference individual: an employed, wage earner, married man, with primary education or less and prospects of similar or lower expenses and savings in the future, located in the first quintile of the wealth distribution (Models 6 to 10) and with average values in the remaining (continuous) variables.