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The impact of Households' Overindebtedness on the Well-being of Young Individuals, Women, and People with Dependents

IEF- PROYECT (*)

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Resumen

Este proyecto investiga si el peso de las deudas personales afecta negativamente al bienestar de los individuos. Para este fin, el proyecto utiliza datos de panel basados en cuatro olas (2002, 2005, 2008, 2011) de la Encuesta Financiera de las Familias Españolas (EFF) y varias medidas de endeudamiento, incluyendo el ratio entre los pagos de deuda y la renta, la existencia de pagos en atraso y los montantes de deuda pendiente. El proyecto también diferencia entre deuda hipotecaria y no hipotecaria. Los resultados, basados en un modelo de efectos aleatorios, muestran que los pagos de deudas y las deudas en atraso están asociados negativamente al bienestar de los individuos. Una característica del proyecto es que éste presta especial atención a tres grupos vulnerables: jóvenes, mujeres y personas con gente a su cargo.

Abstract

This project investigates whether personal debts burdens hamper people's well-being. To that purpose, the project uses panel data from four waves (2002, 2005, 2008, 2011) of the Spanish Survey of Household Finances (EFF) and several measures of debt strain, including debt-to-income ratios, the existence of debt arrears and amounts of outstanding debts. The project also differentiates between mortgage and non-mortgage debts. The results, based on a random effects model, show that debt payments and debt arrears are negatively related with people's well-being. A feature of the project is that it pays attention to three vulnerable groups: young individuals, women and households with dependents.

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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 well-being. Debt may have detrimental consequences on people's mental and physical health through anxiety, stress, increased cardiovascular risk, depression, self-harm and suicidal ideation (Haw et al., 2015; Coope et al., 2015). 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). A recent study based on European data has highlighted the importance of debt in explaining rises in suicide (Reeves et al., 2015).

Understanding to what extent financial strain threatens individual well-being is a relevant economic issue. In this report, we use longitudinal data from the Spanish *Survey of Household Finances* (EFF) to investigate the relation between household wealth, debt and a particular aspect of well-being: health. Among all the existing alternatives to measure subjective well-being (Sacks et al., 2010), health is one of the most relevant and prevalent measures in the literature. To date, the available evidence in Spain is still scarce and contrast with a variety of studies from the US, UK (Bridges and Disney, 2010, Gathergood, 2012) and Germany (Keese and Schmitz, 2014). The objective of this report precisely to fill this gap.

A feature of our study is that it discriminates between different types of individuals, paying special attention to the most vulnerable ones. There is evidence to suggest that the recent credit crunch and recession affected Spanish households in different ways, with young individuals, women and households with dependents being more harmed than other population groups. In this report we pay special attention to these groups.

In the EFF health is subjectively appraised using a five-point response scale ranging from '5- very good' to '1-very poor'. Self-assessed health (SAH) has been widely used in the literature on the socioeconomic health-gradient (Frijters et al., 2005; Benzeval et al., 2011; Blázquez et al., 2014). The main feature of the EFF is that apart from conventional socio-economic characteristics it contains microeconomic information on a vast array of households' assets and debts. While earlier studies are typically based on income data and debt payments, this report explores the role of stock variables such as wealth and pending debts. The EFF also includes 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 pattern 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, monthly debt-to-income ratios are not significant for health determination once explicit controls for wealth and outstanding debt amounts are included in the regressions. This finding suggests that health is more closely related to long-term accumulation of resources and future prospects than to income flows. Fourth, there are some differences across population groups, with women and young individuals being more and less sensitive, respectively, to over-indebtedness.

The report 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 study. Section 4 presents the method of analysis and the research hypotheses. 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 offers a more differentiated view by discrimination among population groups. Section 8 outlines and discusses potential limitations of the present research. Section 9 presents the concluding remarks.

2. THE RELATIONSHIP BETWEEN HEALTH AND DEBT

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 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. The few studies that analyze the wealth-health nexus suggest that wealth differentials account significantly for differences in health status (Martikainen et al., 2003; Perel et al., 2006; Aittomäki et al., 2010).

There is also support in the literature for a correlation between debt burdens and health (Brown et al., 2005; Clayton et al., 2015; Berger et al., 2016). Over-indebtedness may affect individual health status for several reasons, including emotional states associated with depression and anxiety (Fitch et al., 2007; Bridges and Disney, 2010), declining physical health (Drentea and Lavrakas, 2000), unhealthy behaviors (Wardle et al., 2012; Averett and Smith, 2014) and suicidal tendencies (Wang et al., 2012). However, 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. Lyons and Yilmazer (2005) use a simultaneous equation model to test the extent of reverse causality and

find that poor health significantly raises the probability of financial strain. However, in a similar setting, Bridges and Disney (2010) find that most of the causality goes from indebtedness to health. Keese and Schmitz (2014) use different subsample of individuals to block potential channels of endogeneity and find similar results across samples confirming the effect of debts upon health. Findings from instrumental variables partially support this view. Using a variety of instruments for pending debts, Brown et al. (2005) show that household heads who have outstanding non-mortgage credit, and who have higher amounts of such debt, are significantly less likely to report complete psychological well-being. Similarly, 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 to identify the effect of loan-to-value on health and data from the US Health and Retirement Survey. 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. An exception to the overall pattern is Meer et al. (2003), who also rely on IV techniques (inheritance receipts as an exogenous source for changes in wealth) and find that health is essentially unresponsive to changes in wealth.

The present study contributes to the literature by showing that the negative relation between over-indebtedness and health is, at least in Spain, mainly driven by non-mortgage debts. Monthly mortgage payments are innocuous in terms of health. Moreover, previous findings suggest that monthly debt-to-income ratios are significant for health determination. The present research warns that this is not the case if explicit controls for wealth and outstanding debt amounts are included in the regressions. This is an important finding, insofar as it suggests that health is more closely related to long-term accumulation of resources and future prospects than to income flows.

2.1. The Spanish experience

The increased home ownership in the boom years left Spain with relatively high household debt before the onset of the global economic crisis. In 2006, Spain was exhibiting healthy macroeconomic indicators. GDP was growing at a 3.8% rate, the unemployment rate had reached historically low levels (8.5%) and the default rate in bank loans was below 1%. The effects of the global financial crisis initiated in 2007 were devastating for Spain. Spain's unemployment rate hit 17.2% in 2009, reached 24.2% by the first quarter of 2012, twice the eurozone average, and went over 50% among young and low-skilled individuals. For the first time in 15 years, Spain entered recession in the last semester of 2008, and quarterly GDP growth figures remained mostly negative until 2012. During this period the default rate in bank loans rocketed from 1% to 7% (2012)¹.

The junction of these factors notably exacerbated the over-indebtedness problem of Spanish households. During this period, private debt in relation to the available income grew steadily until 2011. For instance, total household debt over total assets went from 8.6% in 2002 to 11.7% in 2011, and increased further onwards, up to 12.5% in 2014 (Boletín Económico, 2007, 2017). In 2002

¹ Data from www.ine.es and the Bank of Spain's Boletín Estadístico, visited in October 3, 2017.

about 7% of households with outstanding debts spent more than 40% of their income on debt servicing. This figure doubled by 2011 and was substantially higher among the income-poor. In June 2013, the volume of outstanding loans of private households amounted to 618,000 million euros (582,887 million euros were mortgages).

Apart from aggregate shocks, cultural factors have also been viewed as the cause of excess household indebtedness. 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. Repossessions and evictions have become an iconic image of the country's economic plight, leading to an increase in the number of citizens suffering severe stress and anxiety problems. 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. With a panel structure, the following waves were drawn in 2005, 2008 and 2011. It is interesting to note that the fieldwork of the 2008 wave lasted from November 2008 to July 2009. Indeed, 82% of the interviews were conducted in 2009. Therefore, data from this year is likely to reflect the first symptoms of the recession. We retain individuals aged between 30 and 80 years. This results in a final sample of 19,243 observations².

² Item-non-response is not a problem in the public version of the EFF. This is so because the 'No Answer' or 'Don't Know' replies for all the variables in the survey have been imputed. Since item non-response is not random, the goal of imputation is precisely to correct for the potential problems of composition bias that researchers face when they are forced to drop observations with missing values. For a detailed description of imputation in the EFF, see Barceló (2006). In our own calculations, we found that the prevalence of imputation in the EFF is relatively low (below 5% in most financial variables used in the paper).

3.1 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'.³ 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 (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).

3.2. 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 secured⁴ or unsecured borrowing, or to payments of rent, utility or other household bills⁵. 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; 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

³ We reverted the original scale so that a negative coefficient in the regression results implies worse perceived health.

⁴ Secured borrowing refers to a loan that is backed with an asset held by the borrower; often their home.

⁵ 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.

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

3.3. 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 (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 study 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.

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)

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

Vector X includes a broad range of controls including household size, gender, age, marital status, employment status, education 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 savings and spending, respectively, will be higher in the future than at present⁶. Moreover, the estimation equation has been expanded to include number of children (defined as household members aged below 16) and number of old age dependents (we have defined them as household members aged 70 or more). With this refinement the model aims at controlling for the differential effect that household members may exert on health and debts depending on their age⁷.

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.

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. higher, 2. lower, 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. higher, 2. lower, 3. the same, 4. don't know. The two dummies introduced in the regression are activated when the respondent answered "higher".

⁷ The authors thank an anonymous referee for this insight.

5. ESTIMATION PROCEDURE

We take SAH to be cardinal or, in other words, that the distance between the five health categories carry a meaning. It has been shown that assuming cardinality as opposed 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. Despite the relatively low number of health categories, we adopt probit-adapted ordinary least squares (POLS) as developed by Van Praag and Ferrer-i-Carbonell (2008: 29-34)⁸. 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 $\mu_{j-1} < SAH_{it}^* \leq \mu_j$, $j = 1, \dots, J$, then the conditional expectation of the latent variable is given by:

$$S\ddot{A}H_{it} = E(SAH_{it}^* | \mu_{j-1} < SAH_{it}^* < \mu_j) = \frac{n(\mu_{j-1}) - n(\mu_j)}{N(\mu_j) - N(\mu_{j-1})} \quad (2)$$

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. Our estimating equation becomes:

$$SAH_{it} = \alpha X_{it} + \beta_l \bar{Y}_i + \beta_s Y_{it} + \gamma P_{it} + \delta F_{it} + \theta D_{it} + \eta W_{it} + v_i + \eta_{it} \quad (3)$$

where η_{it} an independent error term for individual i at time t and v_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. This choice 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. Admittedly, 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

⁸ Riedl and Geishecker (2014) use monte-carlo simulations to compare different estimation strategies of ordered response models in the presence of non-random unobserved heterogeneity. They find that POLS performs well with a three-seven- and eleven-point scale ordered response variable.

example, from being in a permanently serious state of over-indebtedness⁹. The implicit assumption of RE models that the random component v_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 partially 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, $v_i = u_i + \lambda \bar{X}_i^M$. The first part is a pure-error term. The second part is assumed to vary linearly with the within-group means. Thus, Eq. (3) becomes:

$$SAH_{it} = \alpha X_{it} + \beta_l \bar{Y}_i + \beta_s Y_{it} + \gamma P_{it} + \delta F_{it} + \theta D_{it} + \eta W_{it} + \lambda \bar{X}_i^M + u_i + \eta_{it} \quad (4)$$

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.¹⁰

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 estate, other properties and other mortgages), while the second group includes five (main real estate, other properties, other secured loans, personal loans and others)¹¹. We find that over 30% of households were in debt in 2002, with mortgage debts being more prevalent than non-mortgage debts (20.5% and 17.1% respectively)¹². Main real estate debts account for the largest share of mortgage debts (13.9%), while personal loans are the most important component of non-mortgage debts (13.4%). With regard to the evolution of the percentage of indebted households, we observe a significant increase between 2002 and 2005, from 32.4% to 40.3%, and a slight decrease – down to some 38 % – onwards. The increasing trend in the first period affects both mortgage and non-mortgage debts. During the sample period we observe a sizable increase in the proportion of households with mortgage debts (from 20.5% to 26.7%).

⁹ In our sample, the between-waves average rates of variation of household assets and debts are 4.7% and 9.2% respectively, while only 15.5% of the sample individuals see their asset and debt stocks change by more than one-standard deviation across two consecutive waves.

¹⁰ 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.

¹¹ Non-mortgage main real state refers to loans other than mortgage (for instance, personal loans and credit lines) used to acquire real state. 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).

¹² The two types of debt are not mutually exclusive, that is, there are households with both types of debts.

Table 1: Share of households with outstanding debts

	2002	2005	2008	2011
All debts	32.4%	40.3%	38.1%	38.6%
Mortgage	20.5%	26.5%	24.4%	26.7%
Main real estate	13.9%	16.8%	16.1%	16.8%
Other properties	5.9%	8.2%	7.6%	9.4%
Other mortgages	1.8%	3.2%	1.9%	2.6%
Non-mortgage	17.1%	21.4%	20.8%	19.5%
Main real estate	1.3%	0.8%	0.6%	0.8%
Other properties	1.1%	1.1%	1.0%	1.1%
Other secured loans	0.4%	0.4%	0.5%	0.5%
Personal loans	13.4%	17.0%	15.0%	12.9%
Others (credit line. deferred payment..)	2.0%	3.9%	6.2%	6.5%

Notes to Table 1: Source: EFF 2002-2011.

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 in the corresponding category. 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 about above 25% among households with pending debts (1,421 households). This proportion worsened slightly in 2005 (27.6%) and remained roughly constant onwards.

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

	2002		2005		2008		2011	
	Mean	N	Mean	N	Mean	N	Mean	N
Yearly Income	34459.07	4382	39000.98	4840	37737.65	5019	38802.32	5002
Debt/Income	0.253	1421	0.276	1947	0.280	1904	0.274	1911
Mortgage/Income	0.246	900	0.261	1282	0.273	1225	0.266	1329
Non-mortgage/Income	0.184	750	0.198	1032	0.192	1033	0.179	946
Total Outstanding Debts	49213.52	1421	73014.42	1952	74479.29	1912	96612.67	1933
Mortgage	64096.11	900	89720.63	1282	87934.69	1227	105212.5	1337
Main real estate	52924.58	611	67822.58	813	68113.6	808	83251.07	842
Other properties	84116.57	257	113511.9	398	118571.2	382	125147.4	468
Other mortgages	47235.77	79	93658.22	157	78811.2	96	93044.57	129
Non-mortgage	16327.88	750	26495.46	1038	33085.85	1043	47264.78	975
Main real estate	14230.02	56	26360.19	40	36970.87	31	27607.59	41
Other properties	27554.19	47	43737.38	51	136095.6	52	80867.7	54
Other secured loans	63966.65	18	40543.1	17	113821.3	25	220339	26
Personal loans	11093.11	586	23756.52	823	15511.27	754	33007.89	644
Others (credit line. deferred payment..)	28758.82	87	21151.2	188	37522.17	313	41585.63	327

Note to Table 2: Source: EFF 2002-2011.

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 individuals. Average outstanding debts increased by almost 100% between 2002 and 2011, from €49,213.5 to €96,612.7. This increase was even larger for non-mortgage debts, from €16327.9 to €47264.8.

In Table 3 we take the latest available year, 2011, and discriminate among different population groups. Specifically, we focus on young individuals (age < 40), women, and people with dependents (where a dependent is defined as a household member aged below 16). We find that the yearly income earned by women (€26604.6) and, especially, young individuals (€23907.0) is substantially lower than the average income in the total sample (€38802.3), whereas individuals with dependents at home are somewhere in the middle (€32732.23). Moreover, the debt payment-to-income ratios show that these three groups suffer larger-than-average debt burdens, with young individuals exhibiting the highest debt payment-to-income ratio. However, when we disregard debt payments and focus on total pending debts we find that young individuals (€84919.1), individuals with dependents (€82413.4) and, especially women (€64432.1), are less indebted than the average individual (€96612.7). Not only these three groups have lower amounts of pending mortgage debts, they also have also lower amounts of pending non-mortgage debts. In fact, the most striking difference between the three vulnerable groups and the total sample is due to non-mortgage debts. Specifically, the young, women and people with dependents have less than 30% of the pending non-mortgage debts owed by the average individual (€47264.8).

Table 3: Average income, debt payments-to-income ratio and debts - 2011

	YOUNG INDIVIDUALS (<40)		WOMEN		PEOPLE WITH DEPENDENTS	
	Mean	N	Mean	N	Mean	N
Yearly Income	23906.99	779	26604.6	1957	32732.23	1310
Debt/Income	0.320	529	0.283	719	0.309	745
Mortgage/Income	0.299	419	0.276	482	0.288	552
Non-mortgage/Income	0.183	241	0.184	383	0.196	365
Total Outstanding Debts	84919.09	538	64432.1	727	82413.38	753
Mortgage	99754.42	424	82765.4	486	98272.08	557
Main real estate	92908.88	362	74420.9	335	89942.27	432
Other properties	87108.35	91	97881.7	125	95620.46	147
Other mortgages	73600	10	66472.9	46	67640.11	27
Non-mortgage	13508.33	251	16840	393	19519.27	375
Main real estate	28523.86	14	28410.1	19	35849.39	18
Other properties	28878.91	11	54028.8	12	36775.9	20
Other secured loans	44191.5	4	76419.7	7	52557.6	10
Personal loans	8821.815	173	12187.5	273	15691.33	254
Others (credit line, deferred payment..)	12771.71	76	12443.4	126	10816.25	132

Notes to Table 3: Source: EFF 2002-2011.

In Table 4 we inspect again the evolution from 2002 to 2011 of some indicators. We observe a remarkable increase in asset holdings over the sample period. In 2011 assets amounted to €1,370.694, more than twice the 2002 figure. "Other real estate properties" (not including the home) and "portfolio investment institutions" are, by far, the ones that have experienced the sharpest increase over the sample years. In the first case, the increase is accompanied by a higher number of households owning this type of assets (a 53% increase, from 1,902 in 2002 to 2,911 in

2011). In contrast, the number of households with portfolio investments decreased by more than 10% (from 691 to 674), in spite of the huge increment in the average value of this type of assets.

Table 4: Average asset holdings

	2002		2005		2008		2011	
	Mean	N	Mean	N	Mean	N	Mean	N
Total Assets	507665.8	4382	808190.3	4840	1127359	5019	1370694	5002
Value of the business		0		0	1393159	878	2047524	871
Other real estate properties	250977.7	1902	445298.4	2457	618459.4	2600	546233.8	2911
Jewellery, works of arts.	20733.33	996	24365.16	1290	26545.75	1291	44389.5	1510
Accounts used to make payments	8279.751	4320	17273.69	4546	17850.25	4754	28508.4	4852
Portfolio of listed shares	112263	970	184051.6	1167	172618	1197	328664.2	1418
Portfolio of unlisted shares	959604.3	322	1268560	339	1178243	220	1759490	334
Portfolio of fixed-income securities	44390.93	157	59205.85	146	104475.3	176	296820.7	276
Portfolio (Investment institutions)	89056.42	691	171353	912	224104.7	625	356882.3	674
Saving accounts and accounts not used	58719.97	1046	65000.33	1187	101197.3	1631	159467.7	1653
Pensions schemes	26868.2	1215	37188.32	1662	41623.08	1601	59801.04	1689
Life insurances	76763.98	81	113203.1	102	145050.3	93	149404.1	154
Other assets	23645.45	175	35452.95	191	101363.6	373	104626.2	631
Value of your home	167959.8	3763	291963.8	4180	314313.4	4450	320616.7	4431
Additional assets (managed accounts)		0		0	206653.8	56	538395.1	50

Notes to Table 4: i) Source: EFF 2002-2011; ii) na: information not available.

In order to provide a first insight on the debt-health relationship, Table 4 shows the health distribution. The left column considers the sample as a whole while the right column considers only indebted households. 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, although auxiliary tests showed that the difference is not statistically significant. 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 3.9, slightly higher among indebted households, and similar across years.

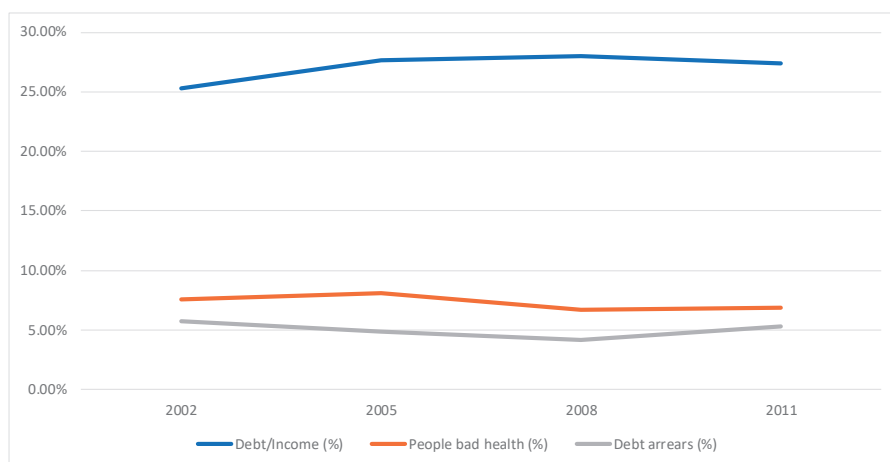
Table 5: Population shares (%) by health status (Total and indebted households)

Health	2002		2005		2008		2011	
	All hh	Indebted hh	All hh	Indebted hh	All hh	Indebted hh	All hh	Indebted hh
1-Very good	15.1	22.0	21.1	26.7	18.0	21.9	18.6	23.4
2-Good	57.9	61.2	50.9	53.2	55.0	59.5	52.2	55.0
3-Acceptable	19.5	11.4	19.9	14.2	20.4	14.5	22.3	17.2
4-Poor	6.5	4.4	7.3	5.3	5.9	3.7	6.2	3.9
5-Very poor	1.0	1.0	0.9	0.6	0.8	0.4	0.7	0.5
Average score (1-5)	2.21	2.01	2.16	2.00	2.17	2.01	2.18	2.03

Notes to Table 5: i) Source: EFF 2002-2011.

In Figure 1 we show the evolution of health and debts over time. Specifically, we display the evolution of two measures of over-indebtedness, the debt payments-income ratio and the percentage of individuals with debt arrears, and the proportion of people with bad or very bad health. The graph is not suggestive of a clear correlation between pending debts and reported health. In the next section, we will show that this is not the case once other important variables are factored out.

Figure 1. Health and debt: evolution 2002-2011



In Figures 2, 3 and 4 we display the same aggregates for the different vulnerable groups (young, women and people with dependents). Figure 2 focuses on the debt payments-income ratio and shows that the three groups experienced a sensible deterioration in this aspect over the sample period, with young individuals showing the largest burden over the years. In Figure 3 we report the percentage of people with bad or very bad health. Here the ranking is reversed, with young individuals being better off than the rest and women being worse off. While among young individuals this health indicator is roughly constant over time, we detect a slight improvement among women and individuals with dependents. Finally, Figure 4 reports the proportion of individuals with debt arrears. The highest and lowest rates correspond to the young and women, respectively. A common pattern across groups is the sharp increase in debt arrears after the onset of the crisis (2008), especially among individuals with dependents. This contrasts with the almost linear trend found in Figure 1 for the total sample, a result that suggests that these three vulnerable groups were hit hardest by the economic crisis.

Figure 2. Debt/income (%): evolution 2002-2011

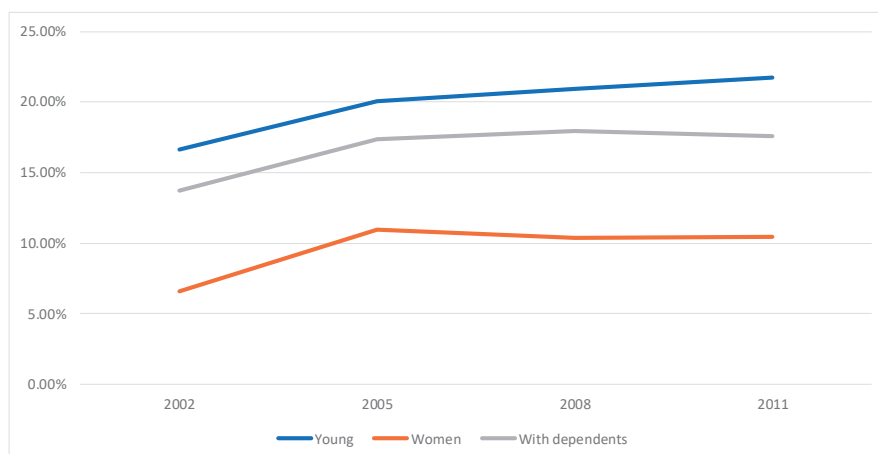


Figure 3. Bad health (%): evolution 2002-2011

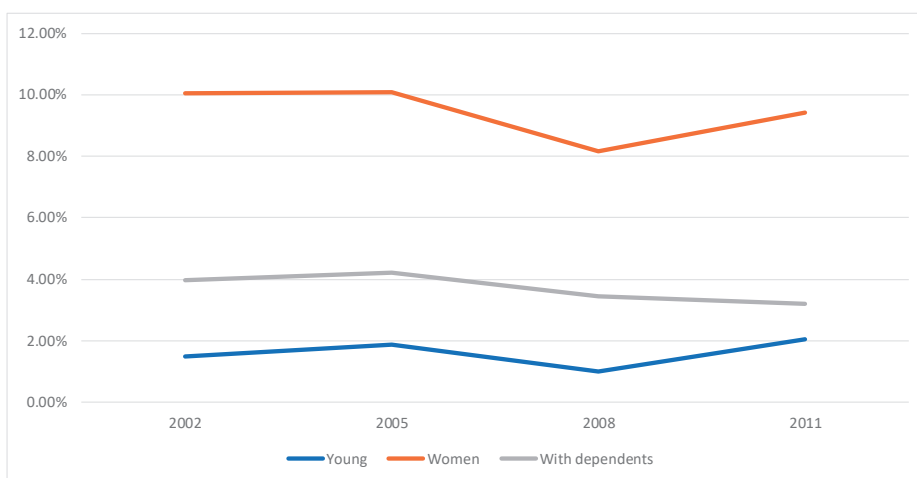
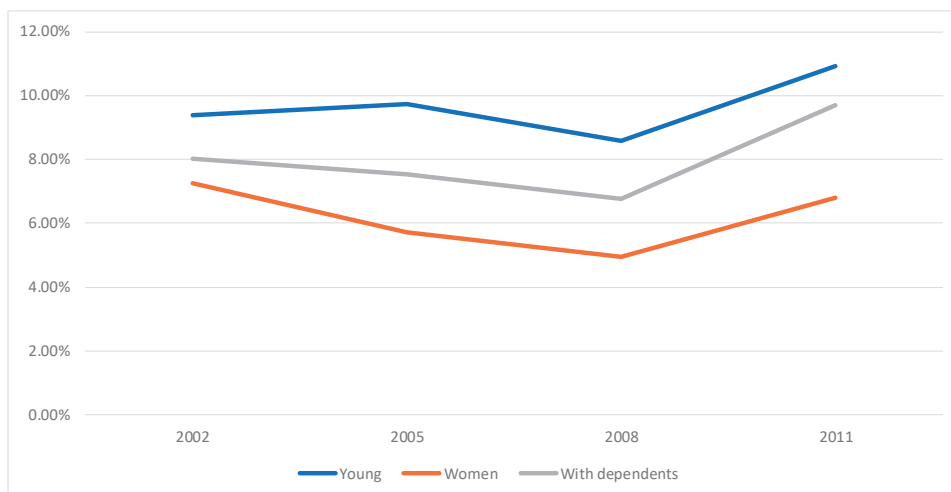


Figure 4. Debt arrears (%): evolution 2002-2011



6.2. The determinants of health

In Table 6 we report the estimation results. We find that, regardless of the specification, transitory and permanent income are significantly related to health. Previous results in the literature indicate that permanent income is more relevant for well-being than transitory income (Benzeval and Judge, 2001, Martikainen et al., 2003, Aittomäki et al., 2010)¹³. 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. Our results are consistent with this view, insofar as the effect of

¹³ Assuming exogenous income may seem controversial. However, there are reasons to be pragmatic. Two-sided causality between income and health has been addressed by earlier papers. A common finding is that income exerts an impact on health, even after income endogeneity is taken into account (Theodossiou and Zangelidis, 2009, Economou and Theodossiou, 2011).

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permanent income ($\beta_l + \beta_s$) is above the effect of transitory income (β_s), the difference being statistically significant¹⁴.

	Over-indebtedness and health (RE estimations with Mundlak)									
	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Average (Log(Income))	0.035 *** 0.016	0.034 *** 0.016	0.034 *** 0.016	0.035 *** 0.016	0.034 *** 0.016	0.025 0.016	0.025 0.016	0.024 0.016	0.026 0.016	0.025 0.016
Log(Income)	0.068 *** 0.013	0.067 *** 0.013	0.066 *** 0.013	0.067 *** 0.013	0.066 *** 0.013	0.051 *** 0.014	0.046 *** 0.014	0.050 *** 0.014	0.050 *** 0.014	0.049 *** 0.014
<i>Debt-to-income ratios</i>										
Debt/income	-0.113 *** 0.040		-0.059 0.041			0.063 0.066		0.098 0.066		
Mortgage/income				-0.053 0.047	-0.018 0.048				0.074 0.086	0.101 0.086
Nomortgage/income				-0.226 *** 0.065	-0.139 *** 0.066				0.034 0.103	0.077 0.104
Debt arrears		-0.213 *** 0.030	-0.206 *** 0.031		-0.201 *** 0.031		-0.173 *** 0.031	-0.177 *** 0.031		-0.174 *** 0.031
<i>Wealth and debt amounts</i>										
q2						0.095 *** 0.021	0.087 *** 0.021	0.086 *** 0.021	0.092 *** 0.021	0.085 *** 0.021
q3						0.153 *** 0.021	0.140 *** 0.021	0.140 *** 0.021	0.149 *** 0.021	0.138 *** 0.021
q4						0.189 *** 0.023	0.176 *** 0.023	0.176 *** 0.023	0.185 *** 0.023	0.174 *** 0.023
q5						0.255 *** 0.028	0.245 *** 0.028	0.243 *** 0.028	0.251 *** 0.028	0.241 *** 0.028
Log(total debt)						-0.007 *** 0.002	-0.004 *** 0.001	-0.006 *** 0.002		
Log(mortgage)									-0.004 * 0.003	-0.004 0.003
Log(nomortgage)									-0.007 *** 0.003	-0.006 *** 0.003

continues in the next page...

¹⁴ Curiously enough, transitory income is not relevant for health if we drop the 2011 wave. A candidate explanation is that after the onset of the economic crisis (2008) individuals became more sensitive to income fluctuations. There is evidence that people exhibit loss aversion, i.e., losses in income have a larger effect on well-being than equivalent income gains (Boyce et al., 2013). The fact that households become more sensitive to income fluctuations in a context of declining incomes is consistent with this idea. Moreover, the extensive literature on habit formation has shown that habit-forming consumers dislike large and rapid cuts in consumption. If individuals are not able to keep up with past levels of consumption in a context of economic crisis, then we should expect a more sensible relation between utility (health in our case) and income fluctuations.

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	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Household size	0.002 0.011	0.004 0.011	0.004 0.011	0.004 0.011	0.005 0.011	0.003 0.011	0.006 0.011	0.005 0.011	0.004 0.011	0.006 0.011
Dependents(old)	-0.022 0.020	-0.024 -0.020	-0.025 0.020	-0.025 0.020	-0.025 0.020	-0.040 *** 0.020	-0.041 ** 0.020	-0.042 ** 0.020	-0.040 ** 0.020	-0.041 ** 0.020
Dependents (young)	0.021 * 0.012	0.020 0.012	0.020 * 0.012	0.020 0.012	0.019 0.012	0.015 0.012	0.015 0.012	0.014 0.012	0.014 0.012	0.014 0.012
Female	0.027 ** 0.015	0.028 ** 0.015	0.028 ** 0.015	0.028 * 0.015	0.028 ** 0.015	0.026 * 0.015	0.027 * 0.015	0.027 * 0.015	0.026 * 0.015	0.027 * 0.015
Log(age)	-3.462 *** 0.944	-3.473 *** 0.941	-3.458 *** 0.941	-3.392 *** 0.943	-3.409 *** 0.941	-4.125 *** 0.948	-4.100 *** 0.946	-4.068 *** 0.946	-4.105 *** 0.948	-4.071 *** 0.946
Log(age)^2	0.325 *** 0.121	0.326 *** 0.120	0.323 *** 0.120	0.316 *** 0.121	0.317 *** 0.120	0.395 *** 0.121	0.391 *** 0.121	0.388 *** 0.121	0.393 *** 0.121	0.388 *** 0.121
Separated	-0.111 *** 0.029	-0.094 *** 0.029	-0.095 *** 0.029	-0.109 *** 0.029	-0.094 *** 0.029	-0.084 *** 0.030	-0.074 *** 0.030	-0.072 *** 0.030	-0.084 *** 0.030	-0.073 *** 0.030
Single	-0.121 *** 0.020	-0.115 *** 0.020	-0.117 *** 0.020	-0.120 *** 0.020	-0.116 *** 0.020	-0.109 *** 0.020	-0.108 *** 0.020	-0.106 *** 0.020	-0.109 *** 0.020	-0.107 *** 0.020
Wage earners	0.211 *** 0.020	0.208 *** 0.020	0.209 *** 0.020	0.210 *** 0.020	0.208 *** 0.020	0.227 *** 0.020	0.224 *** 0.020	0.224 *** 0.020	0.226 *** 0.020	0.224 *** 0.020
Self-employed	0.195 *** 0.022	0.192 *** 0.022	0.193 *** 0.022	0.194 *** 0.022	0.192 *** 0.022	0.174 *** 0.022	0.173 *** 0.022	0.172 *** 0.022	0.173 *** 0.022	0.172 *** 0.022
Unemployed	0.153 *** 0.031	0.167 *** 0.031	0.167 *** 0.031	0.153 *** 0.031	0.166 *** 0.031	0.168 *** 0.031	0.178 *** 0.031	0.178 *** 0.031	0.166 *** 0.031	0.177 *** 0.031
Secondary	0.189 *** 0.024	0.186 *** 0.024	0.187 *** 0.024	0.188 *** 0.024	0.187 *** 0.024	0.170 *** 0.024	0.170 *** 0.024	0.169 *** 0.024	0.170 *** 0.024	0.170 *** 0.024
Tertiary	0.316 *** 0.027	0.310 *** 0.027	0.310 *** 0.027	0.315 *** 0.027	0.310 *** 0.027	0.280 *** 0.028	0.277 *** 0.028	0.276 *** 0.028	0.280 *** 0.028	0.276 *** 0.028
Expenses high	-0.027 *** 0.013	-0.026 *** 0.013	-0.026 *** 0.013	-0.027 *** 0.013	-0.026 *** 0.013	-0.024 * 0.013	-0.023 * 0.013	-0.022 * 0.013	-0.024 * 0.013	-0.023 *** 0.013
Savings high	0.033 ** 0.018	0.034 ** 0.018	0.035 ** 0.018	0.034 *** 0.018	0.035 *** 0.018	0.030 0.018	0.033 * 0.018	0.032 * 0.018	0.031 * 0.018	0.033 *** 0.018
Constant	6.750 *** 1.825	6.818 *** 1.820	6.814 *** 1.820	6.618 *** 1.824	6.814 *** 1.820	8.655 *** 1.840	8.680 *** 1.836	8.585 *** 1.836	8.611 *** 1.838	8.588 *** 1.835
sigma_u	0.181	0.177	0.177	0.181	0.177	0.179	0.174	0.175	0.179	0.175
sigma_e	0.799	0.799	0.799	0.799	0.799	0.797	0.797	0.797	0.797	0.797
rho	0.049	0.047	0.047	0.049	0.047	0.048	0.046	0.046	0.048	0.046
No. Observations	19,243	19,243	19,243	19,243	19,243	19,243	19,243	19,243	19,243	19,243

Notes to Table 6: i) Source: EFF 2002-2011; ii) standard deviations in smaller type; iii) *** denotes significant at the 1% level, ** denotes significant at the 5% level; * denotes significant at the 10% level; iv) Yearly dummies and Mundlak term included in the estimations; v) 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.

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) is associated with a decrease in the SAH score of 0.113 points. Although the estimate is significant at conventional levels, this relation can be regarded as small. However, it should not be so if we consider other determinants of SAH. To determine just how indebtedness compares with other covariates, permanent income is the best reference measure. This equivalent income approach has gained currency in the literature (Blázquez and Budría, 2015, for instance). In Model 1, the relation between health and permanent income is $\hat{\beta}_l + \hat{\beta}_s = 0.035 + 0.068 = 0.103$. Therefore, the trade-off between income and the payment-to-income ratio that maintains

SAH constant must satisfy, $0.103 \cdot \Delta \ln(Y) - 0.113 \cdot \Delta P = 0$. For $\Delta P = 0.1$, the variation in logarithmic income amounts to $\Delta \ln(Y) = 0.110$. Therefore, individuals would need a compensation of $[\exp(0.110)-1] \times 100 = 11.6\%$ of their permanent income to raise the payment-to-income ratio by 0.1 points¹⁵.

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 0.213 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 attracts a negative and significant coefficient (-0.226). This suggests that the negative association between monthly debt payments and health displayed by Model 1 is mostly due to non-mortgage debt payments. In Model 4, individuals would need a compensation of $[\exp(0.222)-1] \times 100 = 24.8\%$ of their permanent income to raise the non-mortgage payment-to-income ratio by 0.1 points. This figure is suggestive of the importance of over-indebtedness for SAH determination.

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. Specifically, we find that the non-mortgage debt payments-to-income ratio is negatively related with an individual's health even after controlling for his ability to meet monthly payments¹⁶.

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-

¹⁵ For the average individual in the sample (monthly income = €3132.1, debt payments = €272.3), a 0.1 increase in the debt-to-payment ratio represents a monthly increase in debt payments of €313.2, from €272.3 to €585.5.

¹⁶ As for the remaining variables, household size is not significantly related with SAH, even though having old age dependents at home is associated with significantly lower SAH in some specifications (M6 to M10). 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. Wage earners, the self-employed and even the unemployed report better health than the reference group, inactive individuals. Individuals with an university education and, to a lesser extent, secondary education enjoy better health than individuals with primary education or less. All in all, these results are not novel for the connoisseur of the literature. 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 harmful for SAH. These patterns change little across specifications.

economic indicators reported in the bottom part of Table 6, relative to Models 1 to 5. This suggests that the link between wealth and 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 (0.095). This effect almost doubles (0.189) if the individual is in the 4th quintile and almost triples (0.255) 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. This observation suggests that wealth is closely related to health, a pattern that 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 have more and better quality access to health care, even assuming similar income, perhaps due to a greater command over resources. Similarly, they may follow healthier life styles and enjoy more 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 are negatively associated with 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) is associated with a 0.007 points decrease in the SAH scale¹⁷. Using the equivalent income formula, such effect would require a 9.6% raise in permanent income to maintain SAH constant. A related finding is that after including controls for wealth and outstanding debts, the coefficient 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 is negatively related with SAH. 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. The two type of debts are innocuous in terms of SAH once we control for wealth and pending debts. This result supports the notion that monthly debt payments are imperfect indicators of the extent of household financial strain and its relation with health. In this line, Model 10 shows that the negative relationship between debt arrears and SAH is over and beyond the effects

¹⁷ The use of the logarithm is due to encompassing tests suggesting that the relationship between SAH and pending debts is concave.

of the current economic condition of the household (income, wealth, outstanding debts and debt-to-income ratios).

Table 7: Over-indebtedness and health - young, women and people with dependents (RE with Mundlak)

	Coeff	Coeff	Coeff
Average (Log(Income))	-0.034 ***	-0.034 ***	-0.034 ***
	0.016	0.016	0.016
Log(Income)	-0.066 ***	-0.066 ***	-0.066 ***
	0.013	0.013	0.013
Debt/income	0.066	0.090 *	0.060
	0.047	0.049	0.052
Debt arrears	0.241 ***	0.164 ***	0.239 ***
	0.036	0.039	0.038
<i>Interactions</i>			
young × Debt/income	0.047		
	0.079		
woman × Debt/income		-0.081	
		0.076	
dependents at home × Debt/income			-0.002
			0.075
young × Debt arrears	-0.098 *		
	0.059		
woman × Debt arrears		0.090 *	
		0.057	
dependents at home × Debt arrears			-0.077
			0.057
No. Observations	19243	19243	19243

Notes to Table 7: i) Source: EFF 2002-2011; ii) standard deviations in smaller type; iii) *** denotes significant at the 1% level, ** denotes significant at the 5% level; * denotes significant at the 10% level; iv) Yearly dummies and Mundlak term included in the estimations; v) Additional controls: age, employment status, education, household size, number of old age and young dependents, prospects of high savings and spending in the future, and year dummies. vi) 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, and with average values in the remaining (continuous) variables.

7. DIFFERENCES ACROSS GROUPS: THE YOUNG, WOMEN AND INDIVIDUALS WITH DEPENDENTS

In this section we focus on three vulnerable groups: young individuals (age < 40), women and individuals with dependents. In section 6.1 we showed, based on raw statistics from the EFF, that these three groups were in a more vulnerable position than others in a number of financial indicators. Moreover, we found evidence to suggest that their financial situation was more sensitive to the onset of the global economic crisis. In this section we ask whether the impact of overindebtedness on health among these groups is also different from that what is observed in the total sample.

Investigating this issue is relevant for policy reasons. For instance, 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. 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. Similarly, young individuals and people with dependents (specially women) are systematically found to suffer a disadvantageous economic position.

Moreover, the gender component in the health-overindebtedness relationship deserves special attention due to the inability of existing models to explain the mental health gap between men and women. 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.

In Table 7 we report the results. For space reasons, we do not report the estimates for all models, from M1 to M10. The full set of results is available upon request. Instead, we select Model 3, a model that we deem representative and suitable for expositional purposes, and include a set of interactions between the overindebtedness variables and the three characteristics outlined above: being below 40, woman and having dependents at home. Moreover, to prevent problems of small cell size, we do not introduce the full set of interactions in a single model. Instead, we estimate three different specifications, each one containing a relevant interaction with a selected characteristic (young, woman, dependents at home).

Column 1 shows that, as in the benchmark model, the debt-to-income ratio does not affect significantly the dependent variable once we control for debt arrears. This is also the case among young individuals. However, we find that the health effect of debt arrears is 9.8 score points lower among the young. This result suggests that the inability to meet payment requirements is less harmful among younger cohorts. Although we do not have data to test for potential explanations, we may hypothesize that the lower amount of pending mortgage debts, the higher flexibility to switch between jobs and the higher education level of this group acts as a buffering device against the legal and economic consequences of delaying payments.

In the next column we focus on the gender interaction. The results show that for the reference individual (a man), the negative effect on health of having pending debts amounts 16.4 points. However, this negative effect raises by 9.0 points, up to 25.4 points, when it comes to woman. This result is suggestive of an important gender component in the health-overindebtedness relationship. This effect remained significant even when wealth and outstanding debts were included as explanatory variables. This finding is consistent with empirical evidence showing that women are less financially literate than men (Bucher-Koenen et al., 2012). To the extent that financial literacy is

related with relevant portfolio choices, wealth accumulation and the ability to deal with financial shocks (Behrman et al, 2012, Lusardi and Mitchell, 2014), one should expect a closer association between health outcomes and debts among females. Complementary evidence shows that women are more likely to be overweight when they have trouble paying bills, while no effects are observed among men (Averett and Smith, 2014).

Finally, in the last column of Table 7 we include an interaction between the debt variables and the number of dependents at home. Somewhat surprisingly, we find that the interaction terms fail to be statistically significant. This result suggests that other things equal, i.e., including income and a wide range of other socio-economic factors, having dependents at home does not mediate in the health-overindebtedness relationship. We may elucubrate that the effects of having dependents at home on health are through reduced per capita income, which is controlled for in the regression.

8. DISCUSSION

The results presented here show that over-indebtedness, as measured by a variety of indicators, is detrimental for SAH. Unveiling the channels by which debt burdens affect health is a challenging issue. In line with Fitch et al. (2007) and Bridges and Disney (2010), one may hypothesize that 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. Besides, if high levels of debt require that a significant portion of income must be allocated to debt repayment, then the potential benefits of borrowing may be offset by financial pressure or distress (Conger et al. 1990). This will precipitate declines in mental health. Moreover, 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). Debt can also reduce the availability of future resources for healthcare investments and lead to a vicious cycle where greater debt can be both a cause and consequence of poor health (Jacoby, 2002). At the same time, financial hardship inhibits rational behavior and can be associated with non-healthy behaviors such as excessive drinking, smoking and excess caloric intake (Wardle et al., 2012; Averett and Smith, 2014). At the top of that 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).

We must note, however, that testing empirically these channels is not a road open to us. The EFF does not include specific questions for mental health, emotional states or personality. Similarly, it does not include information on the respondent's lifestyle in terms of calorie intake, smoking, sports, weight, etc. With this information at hand, we cannot test whether unhealthy lifestyles and emotional states can partially account for the negative association between debts and health. The development of micro data combining rich financial information with individual life styles, personality and moods seems therefore compelling and will help the profession to address this question in the future.

8.1. Endogeneity

Sometimes in the report we abuse language somewhat and refer to “effects”, even though the results do not necessarily imply a causal interpretation. 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.

The EFF contains two questions potentially related to household debt holdings. The first one refers to inheritances in the form of income, real estate 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. At the top of that, the Durbin-Wu-Hausman rejected the endogeneity of the debt arrears variable¹⁸. In later stages of this research, we also attempted to instrument specific debt components, including mortgage debts and consumer credits. Again, the encompassing tests of instrument quality failed to support the validity of the instruments.

9. 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 (EFF), this report has shown 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 are more negatively related with health. The results have different policy implications. First, by iden-

¹⁸ Instrumenting the debt-to-income ratio: F-test for excluded instruments = 0.20 (p-value = 0.82); Sargan statistic of orthogonality = 0.01 (p-value = 0.92); Endogeneity test = 5.3 (p-value = 0.02). Instrumenting the incidence of debt arrears: F-test = 0.88 (p-value = 0.41); Sargan statistic = 3.17 (p-value = 0.08); Endogeneity test = 0.83 (p-value = 0.36).

tifying which forms of debt are more negatively related with health, the report 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 report suggest that debts can be as important as income.

Second, the negative relationship between health and 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 schools¹⁹ with the purpose of improving financial skills among youths. Nonetheless, the recent PISA report on financial literacy²⁰ reveals that Spain's performance is below the average of the 13 OECD countries that participated in the assessment.

Third, the negative relationship between health and over-indebtedness is mediated by specific socioeconomic factors, including age and gender. We found evidence to suggest that debt arrears are more harmful among women than among men, and less harmful among young than among older individuals. A clear implication of this result is that policies aimed at improving households' financial stability and decision making should take this heterogeneity into account, paying special attention to women and people at different stages of their life cycle.

¹⁹ The so-called Financial Education Plan (*Plan de Educación Financiera*), available at: http://www.cnmv.es/DocPortal/Publicaciones/PlanEducacion/PlanEducacion13_17.pdf

²⁰ Available at: <http://www.oecd.org/pisa/keyfindings/PISA-2012-results-volume-vi.pdf>

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