

Household Indebtedness and Financial Fragility Across Age Cohorts, Evidence From European Countries.

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Abstract

The rapid economic growth in the EU countries during the decade before the European crisis of 2008, the development of a single financial market, and the favourable conditions in the credit market, generated high household debt burdens reaching historical levels across member states. The increasing financing of household consumption by borrowing, turned household debt from a rather passive endogenous variable in macroeconomic models to an important and active determinant of aggregate demand and a major driver of macroeconomic policies. The present study employs the Household Finance Consumption Survey data from the European Central Bank to assess the role of household's demographic and financial characteristics in determining the level of household indebtedness and the possibility of facing financial pressures. Tobit models are used to assess the impact household characteristics on secured and unsecured debt and Probit models to account for the likelihood of becoming financially fragile. Findings indicate that age, income, employment and financial assets holdings are the most significant determinants of the two components of household debt while peer income effects among others is a robust determinant of financially stressed households.

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1 Introduction

The last few years have witnessed a growing interest in the studying of household debt. It has been conclusively shown that the easing of financial constraints and the preserved low interest rates of the last two decades have induced significant rises in the amount of debt held by households (Debelle, 2004). Although this development has been welcomed in terms of households consumption smoothing over the life cycle, concerns have risen as a higher liability side of the balance sheet is likely to make the household's financial position more prone to abrupt changes in income and interest rates. Indeed, the economic downturn linked to the European banking and debt crisis since 2008 affected significantly these countries households balance sheets. Especially, those households located in the periphery of the European Union, namely Greece, Spain, Ireland, Italy and Portugal, indicated the highest levels of unemployment and income falls. Although, the distribution of household debt within these countries is quite diverse, the abrupt changes in income and employment have brought a number of periphery households in a situation of financial distress. For instance our estimations reveal that already in the beginning of the European crisis Portugal, Greece and Spain indicated a percentage of financially fragile households of around 22%. The same measure for France and Germany estimated around 17% to 18% was lower but still significant. Therefore, studying the structure of household secured and unsecured debt distribution and the likelihood of getting financially fragile is of particular importance to be able to evaluate the institutional structures of these economies, to understand the crisis impacts on households' balance sheets and to provide policy insights for mitigating the financial consequences of the crisis.

Previous research has shown that demographic and socioeconomic variables have a significant effect on the household indebtedness level and the instance of financial fragility. However, little empirical evidence exists that takes into account the structure of these determinants and therefore controlling for households' heterogeneity which is likely to have an impact on their involvement in the debt market. Moreover, most empirical work looks the total size of debt (e.g. debt to income ratio, debt services to income, total debt) and do not take into considerations the fact that the relative influence of the determinants may differ on the two major components of debt, namely collateralized or not. Additionally, when it comes to the determinants of financial fragility, little work has dealt with the potential liquidation of financial assets by the household, as well as possible peer effects on debt behavior.

The present study employed cross-sectional survey data from Eurosystem Household Finance and Consumption Survey (HFCS) with the aim to estimate the effect of demand factors for debt accumulation on both secured debt and unsecured debt as well as the probability for the household to face financial pressures. Given the nature of the sample for debt holdings, we employed a Tobit model that uses the amount of debt level as the latent variable. With regards to financial fragility, we employed an index proposed by Ampudia et al. (2014) as the dependent variable of our model, having the advantage that takes

into account future liquidation of household's assets. Given the binary form of the two dependent variable a Probit model was estimated.

2 Literature Background

A theoretical issue that has dominated the field of theoretical and empirical research on household borrowing for many years is validity of the life-cycle hypothesis (LCH) and the permanent income hypothesis. According to these theories, consumers are assumed to seek stable consumption during their life circle, achieving it by borrowing and saving accordingly. As their productivity varies across the life cycle and so do their earnings, in an abrupt fall of income they would borrow against future earnings so as to stabilize their consumption patterns. Furthermore, according to the Permanent Income Hypothesis (PIH), as agents look for life-time utility maximization, a change in consumption is not likely to occur due to a transitory change in income, but rather due to a permanent income shock (Friedman, 1957; Ando and Modigliani, 1963).

With respect to the change in the structure of population, the LCH predicts that elderly individuals or households, by the age of retirement would have accumulated a sufficient amount of financial or real assets. The return of these assets, or their yields, would support consumption once productivity has fallen and, in turn, labor income is not a sufficient source anymore (Modigliani, 1986).

For several years empirical research on household debt has been almost univocally focused on evaluating the aforementioned theories. In an influential work by Hall (1978), it was demonstrated that in contrast to the life-cycle hypotheses, consumption is considerably sensitive to income changes. Possible explanations to these findings have been attributed to borrowing constraints (Deaton, 1992; Attanasio, 1998). Households finding it difficult to borrow at will are incapable of smoothing their consumption in economic downturns by borrowing against future income. Therefore, their level of consumption relies to a large extend on their current income.

Another challenge to the LCH has risen in the light of the rising ageing share of the population in the western world. In particular, influential papers by Hamermesh (1984) and Bernheim (1997) were concerned with the adequacy of savings for retirement, namely that the elderly people resources, either from social security systems or their own, do not suffice to meet their consumption needs after retirement. Anderloni and Vandone (2008), performed an inclusive literature review on household over-indebtedness. The vast majority of empirical papers on debt held at household level falls under one of the following categories: those investigating the determinants of debt levels held by households and those looking to the factors that induce already indebted households to face issues of financial distress.

A number of papers is concened with the distinction between secured and unsecured debt. One of the first examples of research examining secured and unsecured debt based on household data has been performed by Cox et al. (2002). The authors observed the distribution of financial stress across British house-

holds and provide insights about which households are more likely to experience financial difficulties. Their descriptive analysis indicates that while the youngest and poorest households are those who are sensitive to sudden shocks, the biggest share of the overall debt stock is concentrated in the wealthier households.

La Cava and Simon (2003) aimed to find whether the rise in debt to income ratio has been accompanied by an increase in the proportion of financially constrained households in Australia. Results shown that demographic characteristics and income were significant in determining cashflow constraints. They also found that more debt is held by higher-income households, all other things being equal.

Del Rio and Young (2005), provided evidence for British households that although their unsecured debt holdings have risen slightly from 1995 to 2000, the factors which determined their debts remained the same. The most significant explanatory variable for unsecured debt was found to be income was followed by age. Other determinants included were economic prospects, education qualifications, employment status, household status, the extent of mortgage borrowing and gender.

Yilmazer and DeVaney (2005) found that age, income, marriage, holding of assets (financial and non financial), marriage, risk tolerance self-employment and retirement was the important determinants of total debt. The variable of gender did not have an effect on credit card balances but it was found to influence mortgage debt (secured debt). Also non-financial assets were not significant only for outstanding credit card balances.

Brown and Taylor (2008) used three different sources of survey data corresponding to US, Germany and G. Britain to identify, among others, the factors affecting the sum of secured and unsecured debt. The results of their Tobit model showed that age, income, education level, gender, marriage (not for Britain) ethnicity, number of children (not for Britain), household size (not for Britain) and employment (not for Britain) were significant factors determining debt. Health status found significant only for the equation of Britain.

In a recent paper by Georgarakos et al. (2013) for a Dutch population sample, it was shown that the households perception for its social circle average income is positively related with higher amounts of outstanding debt. Bover et al. (2014), used HFCS in examining debt holdings found that both secure and unsecured debt differ considerably across 11euro area countries. Their evidence suggests that higher income, higher levels of education, employment household size are associated with a greater likelihood of holding secured debt and the amount of debt hold.

Ehrmann and Ziegelmeyer (2014), employ the HFCS household data to identify the determinants of fixed and adjustable interest rate choices on mortgage loans. Their findings are in line with the risk management notion of Cambell and Cocco (2003), namely that households that are prone to income variations and owners of relatively large mortgages go for a fixed interest rate mortgages as it serves and insurance against adjustable interest rates. Furthermore, they run micro simulations to assess whether the loose monetary policy in response to the European banking crises brought any relief on over-indebted households. They

show that a counterfactual course of events with high mortgage rates would have harmed especially those with liquidity constraints and low income.

3 Data and Methodology

3.1 Data Sources

Cross-country comparisons with survey data are thought to be difficult due to the scarcity of comparable variables on household debt behavior (Jappelli et al., 2008). In the present study, we employ data drawn from the first wave of the Eurosystem Household Finance and Consumption Survey. Indeed, a significant advantage of the HFCS data is that the surveys are performed in a standardized manner across Eurozone countries, hence allowing for comparisons between them. The survey data focus on both stock and flow variables, i.e. wealth and income/consumption, it is a complete dataset for balance sheet variables and they are considered a representative sample (Ehrmann, 2014).

Household data carry a number of advantages and bring valuable insights to the analysis of variables such as income and debt. For instance, in contrast to the national accounts, household data shed light to the particular characteristics of different population groups, such as the youth or the females, whose particularities would not be revealed in an aggregate empirical analysis. For the first wave of HFCS data that we employ, interviews were concluded during 2009 for Greece and Spain and during 2010 for France, Germany, Italy and Portugal. Our analysis is the household unit and all individual characteristics (i.e., gender, age, educational level, self-perceived risk aversion) mentioned refer to those of the head of the household. To calculate the income tax for each household we used the tax brackets per level of income for the corresponding year in each country OECD tax database. The countries under examination are Germany, Greece, Italy, Portugal and Spain. Tables 1, 2, 3, 4, 5, and 6 provide descriptive statistics for the variables in question of each of the countries.

3.2 Variables

Most common candidates in the econometric literature concerning household debt include the age of the household head, the marital status, the existence of children, the occupation, the educational level, the income and the households wealth (either liquid or illiquid) among others. Generally, the predictors of households debt, are classified into four types of factors which are the income variables, the financial status variables, the socio-demographic characteristics and the attitudinal indicators.

In the following paragraphs, in correspondence to these four types of factors, the variables used as determinants of debt in the econometric analysis will be discussed

3.2.1 Financial Fragility

There are a number of studies that look at the determinants of household financial fragility. A notable division in the relevant literature is due to the existence of various approaches to proxy financial fragility. On the one hand, a bulk of research on financial fragility focuses on the capacity of households to service their debt obligations using objective indicators such as the debt-to-income ratio, the debt-service ratio, or the mortgage income gearing. Representative works on these lines are Cox et al. 2002 and Brown and Taylor, 2008.

On the other hand, a number of studies consider subjective measures of financial distress, derived directly from whether the interviewed has answered positively to questions such as, Could not pay their utility bills due to a shortage of money, Sought financial help from friends or family due to a shortage of money, and others. Works in this strand of literature include la Cava and Simon, 2003. In order to deal with the subjectivity that non-quantitative kind of studies are regularly prone to, Brunetti et. Al. 2012 developed a novel indicator of financial fragility. Ampudia et al. (2014) propose a Financial Fragility index that takes into consideration the liquidation of financial assets under a certain period.

3.2.2 Income and Age

Income and age are considered the most important determinants of debt holding. The usual pattern, in accordance with the Life Cycle Hypothesis, is that people borrow more while young, save in their middle age and spend after retiring. Young people are keener to borrow money in order to provide for themselves (cars, apartments, universities) (Cox et al 2002). Del Rio and Young, (2005) show that the age group 20-30 is most probable to borrow unsecured debt. Cox and Jappelli (1993) and Duca and Rosenthal (1993) find that debt increases until the age of the household head reaches the mid-30s, and then starts decreasing.

As far as unsecured debt is concerned, the decline in demand with age happens for the people with a college/university degree while in different occasions it has no noticeable outcome (Duca and Rosenthal 1993). Thus, a study from the United States suggests that more and more people from preretirement and retired age are at present under pressure with debt, since both the percentage of households with debt and the debt levels have increased for the ages of 55 and over (Copeland 2009, and Draut and McGhee 2004). However, Crook (2001) in his survey study (SCF) for the USA shows that households headed by an individual over age 55 had a reduced demand for overall debt. People with higher income are keener to borrow since they can afford to pay a higher debt burden. Therefore the higher the income the more likely it is to have debts. This may mirror the degree of difference in admission to credit. Poorer households typically have minute housing assets, which are a key aspect in acquiring access to secured or unsecured debt (Bertola et al, 2006). A study for Germany in 2002, shows that the top 20% of the income distributions holds less debt than the middle class households. At these high-income levels, nearly every household

in the United Kingdom and the United States own a number of debt contracts. However, in Italy only a third of the rich households have debts while the higher rates are amongst the poorer 20% of the population. (Bertola et al, 2006).

Evidence, in line with the Permanent Income and Life Cycle hypothesis indicate a positive relation amid expected income and debt. Current income and debt can be inversely proportional the higher the current income the lower the size and the probability of the debt. Nevertheless, at low and middle levels of income, the probability of a debt can as well rise when income ascends. According to the Neoclassical theory, low income households have a high marginal utility of consumption which means that when the income increases this may lead to a need for further expenditure and thus to more loans. Moreover, when low-income households have an income increase this raises the likelihood that they can easier assure down-payment conditions. As a result, the precursor of the general income outcomes is uncertain (Magri, 2002).

3.2.3 Financial Assets

Financial wealth is also considered an important determinant of debt. We expect a close association between financial wealth and debt. Assets are separated into real estate and non-real estate. Real estate assets are those corresponding to the value of the housing properties (primary and secondary properties) reported by the interviewee and other members of the household. If a household raises a loan to buy a new home, it is reasonable to assume that households total gross debt will increase correspondingly. This is because the seller is not normally another household that can use the sales sum to repay debt. For a given house price level, growth in the housing stock will therefore result in an increase in gross household debt. Many households accumulate financial assets (e.g stocks, bonds, mutual funds etc.) and real estate not only in hope of earning extra income but also to finance consumption in rough days, to use them as collateral for borrowing or enable them to pay older and more urgent debts. As to the direction of the effect on debt, according to the life cycle theory, the probability of debts decreases as the financial assets increase. Yilmazer and DeVaney (2005) found for US households that financial assets have an unhelpful result on the probability of debt, mortgage debt, and installment debt. Moreover, results of survey studies indicated that the older the household the highest is the size of financial asset holdings. Johansson and Persson (2006) in a study on households assets, liabilities, and ability to pay found that households with a high income are more prone to debt. Similarly for U.S. younger households invest in housing and are deeply in debt while older households are greatly skewed to financial assets (Wolf, 2010). While in Germany, a young household has twenty times less financial assets than an old one (aged 60+) (Brown, S. and Taylor, 2008). The above results are confirmed to a large extend by the work of Yilmazer

DeVaney (2005) where the negative result of financial assets on the likelihood of having a debt raises (in absolute value) according to age as financial assets increase. As far as credit card debt is concerned, financial assets have positive result under the age of thirty 30 and a negative one above the age of sixty.

A negative relationship also seems to appear between the amount of financial assets and unsecured debt. Banks et al (2002), in analysing the distribution of debt and financial wealth of British households found unsecured debt is more probable between people with no financial assets. In the same way, Del Ro and Garry Young (2005) show a negative rapport amid the volume of financial assets and having an unsecured debt.

3.2.4 Unemployment

Changes in households employment status such as losing a job may have a direct influence on debt holding. One of the earliest studies using survey data (SCF) by Duca and Rosenthal (1993) indicated a negative relationship between the demand of debt and young households. Crook (2006) found that employed and self-employed people are more likely to hold debts than retired or unemployed. Bover et al. (2014), in their survey study about the distribution of debt across euro area countries, found that secured debt is more likely to exist in employed households. It is expected that an employed individual is more likely to get easier credit by financial institutions while unemployed people are usually confronted with constraints for the supply of loans. As to the impact of unemployment to unsecured debt the level of asset holdings appears to function as a mediator. Sullivan (2008), using panel data for US households, has shown that unsecured debt can increase among unemployed people that hold some type of assets in order to smooth consumption. On average, borrowing increases to supplement lost earnings by about 11 cents per lost dollar. In contrast, low asset households are less likely to borrow due to supply side constraints while wealthy households do not increase unsecured debt.

3.2.5 Education

An important factor of household debt according to many studies is the level education of the household members or the households breadwinner (Chen and Finke, 1996; Godwin, 1998). Education can be a sign of superior prospect income and better job safety and so is consistent with the Permanent Income Hypothesis and the Life-Cycle theory. Broadly, the level of debt rises respectively to the level of education. People with higher education are likely to earn more and consequently can save money. Crook (2006) in his estimates of USA and Italy found that demand for mortgage and unsecured debt increased when household education was higher. Moreover, people with higher education usually have higher financial literacy. Credit card debt probability increases with the level of education as well either because people get more loans to finance their studies or because they earn more and they can therefore afford more debts. Therefore, it is predicted that individuals with higher levels of education will be more likely to be convenience users of credit cards. Kim and DeVaney (2001) found that there were some dissimilarities in the determinants of the probability of having an outstanding credit card balance and the amount of the balance; by researching data from the 1998 SCF they report that whereas in-

come and education were negatively related to the likelihood of carrying a credit card balance, they were positively related to the total of outstanding balance.

3.2.6 Family size, marital status and gender

Aside from age, education and employment status, researchers often take into account other socio-demographic variables like family size, marital status, and gender to explain and determine household debt. It is expected that the greater the number of the household members the higher the demand for consuming durables, the demand for medical or education expenses and therefore the greater the likelihood for households in demanding and holding debt. Results of Crooks (2001) study present that the demand for debt for US households over the period 1990-1995, was positively associated to family size while gender was found to be irrelevant. However, it is not completely transparent whether married household with children have higher level of debts.. For example Lunt and Livingstone (1992) provided evidence that married households are less prone to loans than singles and that the number of children in the family do not affect significantly the use of debt. Studies in Italy and the U.S on mortgage demand show that being married has no consequence on household income (Crook, 2006). Another study, which examined installment loans drawn from 1998 SCF data, found that family size is not a significant determinant (Lee and DeVaney 2000). The results from Xiao and Yao (2011) research that examined data debts held by American families (1989-2007 Surveys of Consumer Finances) and aimed on marital status, gender, and child status showed that married couples and families were more probable to have a mortgage, a car loan or a credit card debt. Furthermore, the biggest debts were found amongst families and couples with children and single mothers.

Findings of Brown et al (2012), using data from Panel Study of Income Dynamics (PSID) for eight years spanned from 1984 to 2007 specified that there is 81% likelihood for a married person to have a debt over a single one and that married people have an 8.5% more debt than singles. These results may mirror the joint debt for couples, like a joint mortgage. On the contrary, the number of children did not affect debt. In the same study gender was found significant for holding debt. Finally Del Rio and Young (2005) found that the probability of unsecured loans is greater between married couples and females than singles. However the amount of money borrowed is considerably smaller for women than men.

3.2.7 Risk Aversion

Since the studies of Kenneth Arrow and John Pratt in 1960s and 1970s focusing on the relation of wealth and risk aversion, the attitudes of individuals towards risk have been central in many fields of economics. Households income is usually the means by which debt is repaid. However income is vulnerable to permanent or temporary shocks (e.g. redundancy, unemployment, wages) and the individual is exposed to uncertainty regarding his ability to repay the debt. Therefore

the attitude towards risk of the household is expected to have an important role in the decision to borrow, given the time path of income and fluctuation of interest rates. It is rational for a household that the more risk averse he is the less will be his debt burden. Godwin (1997) provided evidence that during the 1980s, US households have become more negative towards credit, thereby suggesting an increase in debt aversion over this period. Crook (2001) also found that US households demand for debt is negatively related to risk aversion. The analysis of Del Ro and Young, (2005) for British households shown that from 1995 to 2005 there was an increase of unsecured borrowing by high-risk households but there was no strong evidence that borrowing is concentrated among high-risk households.

3.2.8 Peer Effects

An increasing number of empirical literature dealing with survey data in economics is looking at how social interactions and perception of peers social status influence key financial decisions taken by the household. Nevertheless, with the exception of Georgarakos et al. (2013), little work has looked at how the relative standing of the household influence its indebtedness and the possibility of falling into a debt burden. In their study, Georgarakos et al. (2013), employing the DNBHS survey for Netherlands, focus on subjective questions concerned with whether each household perceives its peers more or less affluent than themselves, performing Probit and Tobit specifications on Panel Data. Their results suggests a positive association between perceived peer income and indebtedness levels on both secured and unsecured debt. To capture peer effects we control for a common set of characteristics among households and estimate the median income in each subset. Specifically, we estimate the median income of each subset controlling for age and education. The relative standing of each household is then estimated by the difference of net income of each household unit from the median income of the social group it belongs.

3.3 Tobit Analysis

Tobit analysis was advanced by Tobin (1958) and takes the assumption that the dependent variable includes a number of values that are clustered at a pre-defined limiting value, normally zero. In such cases a simple linear regression on a subset of the sample, such as ordinary least squares, would yield biased and inconsistent estimates (Maddala, 1992). The advantage of the Tobit regression instead is that it employs the entire available sample, including both those values that lie below and above the limit, and thus provides more information than those regressions limited in a subset of the data (McDonald and Moffitt, 1980).

The technique is seen in the literature since the fifties with notable papers including Tobin (1958), regressing on the durable goods expenditure divided by disposable income, Dagenais (1975) on the value of purchased automobiles and Keeley et al. (1978), on the yearly hours worked taking different sample fractions depending on which member of the household is examined. In the context of

household finance, Brown and Taylor (2008), employ a bivariate Tobit model to allow for the possibility of interdependent decision making between household's assets and liabilities.

With regards to our dependent variable, secured and unsecured debt, a large portion of the sample present no debt holdings. In particular, the portions of household's holding secured debt are 25.3% for Portugal, 25.9% for Spain, 9.1% for Italy, 16.4% for Greece, and 28.1% for Germany, while the portions for unsecured debt are 18.1% for Portugal, 22.5% for Spain, 16.5% for Italy, 27.2% for Greece, and 32.1% for Germany. Due to nature of the research question and the consequent large presence of zero debt holdings in the dependent variables, in line with Magri (2002), we suggest that the appropriate econometric specification for assessing secured and unsecured debt determinants is the Tobit analysis.

The standard Tobit specification we employ is the following:

$$Debt_i^q = \begin{cases} Debt_i^*, Debt_i^* > 0 \\ 0, Debt_i^* \leq 0 \end{cases} \quad (1)$$

In truncation from below at zero all the households with non-positive levels of debt are censored to zero. The censored regression model we employ has the following typical form:

$$\{Debt_i^* = x\beta + e \quad (2)$$

where $Debt_i^*$, the dependent variable, stands for levels of secured or unsecured debt and, and takes values according to the above piecewise specification. The notation x stands for a vector of independent variables that resemble the household characteristics. Table 1 presents the code names for the variables used in both regressions and its definitions. Most of the variables are binary with the exception of secured debt, unsecured debt, financial assets, real assets and peer income difference that have been transformed into logarithms to reduce heteroskedasticity in our model. The Tobit regression models are estimated in R version 0.98, with the package "Applied Econometrics with R" (<http://cran.r-project.org/web/packages/AER/AER.pdf>).

Table 1: Variables Definitions

Variables	Definitions
1 LogSecured debt	Debts pledged to assets as collateral (e.g. home mortgages, car loans etc)
2 LogUnsecured debt	Debts that are not tied to any assets (e.g. credit card debt, student loans, etc)
3 Financially Fragle	1 if Gross Income - Taxes - Debt Payments - Basic Living Costs + Liquidation of Financial Assets > 0; 0 otherwise
4 Age18-24	1 if aged 18-24;0 otherwise
5 Age 25-34	takes value 1 if aged 25-34;0 otherwise
6 Age 35-44	takes value 1 if aged 35-44;0 otherwise
7 Age 45-54	takes value 1 if aged 45-54;0 otherwise
8 Age 55-64	takes value 1 if aged 55-64;0 otherwise
9 Age 65>	takes value 1 if aged 65 and more;
10 Income 1st quantile	1 if falls in the first gross Income quantile;0 otherwise
11 Income 2nd quantile	1 if falls in the second gross Income quantile;0 otherwise
12 Income 3rd quantile	1 if falls in the third gross Income quantile;0 otherwise
13 Income 4th quantile	1 if falls in the fourth gross Income quantile;0 otherwise
14 Currently Employed	takes value 1 if currently employed;0 otherwise
15 Family size	Number of people residing in the household
16 Married	takes value 1 if married;0 otherwise
17 Female	takes value 1 if female;0 otherwise
18 LogFinancial Assets	Total Financial Assets
19 LogReal Assets	Total Real Assets
20 Own a credit card	takes value 1 if owner;0 otherwise
21 Education level 1	1 if education qualification is primary or below;0 otherwise
22 Education level 2	1 if education qualification is lower secondary or second stage of basic education;0 otherwise
23 Education level 3	1 if education qualification is upper secondary;0 otherwise
24 Education level 4	1 if education qualification is post-secondary and tertiary;0 otherwise;0 otherwise
25 Risk Level 1	1 if take substantial financial risks expecting to earn substantial returns;0 otherwise
26 Risk level2	1 if Take above average financial risks expecting to earn above average returns;0 otherwise
27 Risk Level 3	1 if Take average financial risks expecting to earn average returns;0 otherwise
28 Risk Level 4	1 if not willing to take any financial risk;0 otherwise
29 Peer Income Effect	The logged difference of the Median Income of a household's age and educational subset from the household's net income

3.4 Estimated Tobit Model: Secured and Unsecured Debt Levels

To estimate the determinants of household debt levels we employed different models for the two types of debt, secured and unsecured. Because of a large proportion of respondents with no debt holdings we performed a Tobit regression to explore the determinants of household indebtedness. The results for the Tobit model for all the five countries we looked at are presented in the tables 7 to 10.

Among the twelve factors in the Tobit regression, income and age dominate with their presence in all six equations. Specifically, for both secured and unsecured debt the age groups of 35-44 and 45-54 years were found more likely to hold large levels of both secured and unsecured debt, compared to those above 65 that serve as the reference category. Although the direction is similar in all sample countries, the incidence of higher likelihood of debt holdings in the middle of the age distribution is particularly present in Portugal, Spain and Italy. Judging from the size of the coefficients age plays a greater role for the amounts of secured debt rather than of the unsecured debt.

Income, as expected, had a very strong influence on both type of debts. With the exemptions of Germany for unsecured and Italy for secured debt, households which belong to the 2nd, 3rd and 4th quantiles of income are more likely to hold big amounts of secured and unsecured debt than those in the first quantile of the income distribution.

Employment was shown to be a statistically variable in explaining the amount of household secured debt in the cases of Spain, Italy and Germany, while for unsecured debt it was found statistically significant in the cases of Italy, Greece, and Germany. The estimated coefficients, indicate that the probability of holding more debt for those employed is much higher for the unemployed. This is true, especially for secured debt where the magnitude of coefficients are much higher from those related to unsecured debt.

Family size was found to be a moderate determinant of household debt. It was found to be positively associated to the amount of debt held in all our models with the exception of secured debt for Portugal. The largest coefficient appears in the equation of Italy and Greece indicating that large families have much higher probability to holding secured debt than households with fewer members. Regarding, unsecured debt, family size indicated the strongest association with debt holdings in the case of Germany. These results are in line with empirical findings of other studies (Del Rio and Young, 2005, Crook 2006, Bover et al 2014).

Results with regards to whether being married has a significant influence on debt holdings are mixed. Greece indicates the coefficient with the highest magnitude followed by Spain, indicating that in these countries a married head of household has much higher probability of holding secured debt than an unmarried head. Marriage does not seem to have an impact on the accumulation of unsecured debt, with the exception of Portugal where households with a married household head are less likely to hold consumer debt.

Financial asset holdings proved to be an important variable in explaining

both types of debts. The likelihood of holding both types of debt decreases with higher levels of financial assets and this is more prominent for German and Spanish households while much less for the households of the three periphery countries (Greece, Italy and Spain). The aforementioned finding is largely in agreement with the results of Del Rio and Young (2005) for British households.

As to real estate assets, was found to have a significant and positive association with secured debt in all five countries being analyzed. Nevertheless, only Greece and Italy indicated a positive positive sign with respect to unsecured debt. The association to unsecured debt may be an indication that real assets serve as collateral for unsecured debt like business loans or credit card debt.

It is expected that owning a credit card increases the probability of having unsecured debt. Indeed, our findings confirm this expectation with all five countries showing strong association between credit card holding and holdings of unsecured debt. Interestingly, credit card ownership indicated a much stronger association to unsecured debt holdings in the countries of the periphery, and especially in Greece, than in Germany. Turning to secured debt, the influence of credit card is in the same direction but the magnitude is in lower levels than in unsecured debt.

Consistent with findings of other studies (Godwin, 1998; Kim and DeVaney 2001; Crook 2006), a significant and positive relationship exists between attaining more education and debt holdings. With the exception of Germany and Italy that presents an increasing likelihood for more unsecured debt held by the household most of our estimates found no statistically significant relationship between education and debt accumulation.

3.5 Probit Analysis

So far our analysis focused on the determinants of secured and unsecured debt levels in the five European countries. Nevertheless, from a household's perspective even a significant load of debt may not be an issue of concern as long as there are corresponding cash inflows to service it. The European crisis of 2009 reflected an abrupt change in the balance sheets of European households, with certain demographic groups facing adverse hits on their income, employment position, and asset values.

In the present section of the paper we implement a Probit regression analysis to estimate the probability of a household becoming financially fragile. Our index of financial fragility follows that of Ampudia et al. (2014) that takes into account liquidity considerations.

$$d_i^q = \begin{cases} 1 & \Leftrightarrow FMI_i^q < 0 \quad \wedge \quad \sum_{t=1}^M FM_{t,i}^q + LIQ_i^q < 0 \\ 0 & \Leftrightarrow FMI_i^q \geq 0 \quad \vee \quad \sum_{t=1}^M FM_{t,i}^q + LIQ_i^q \geq 0 \end{cases} \quad (3)$$

where

$$FMI_i^q = I_i^q - T_i^q - DP_i^q - BLC^q \quad (4)$$

where I_i^q is the i -th household gross income and T_i^q and DP_i^q are taxes and debt payments paid by household i in country q and where the basing living costs

BLC^q in country q is defined by $BLC^q = \phi^q \cdot \tilde{I}^q$, where ϕ is country q 's fixed percentage of its median income \tilde{I}^q .

d_i^q takes the value 1 if the financial margin by household i in country q is negative, allowing for the household to liquidate its financial assets LIQ_i^q in a given period. Inversely, it takes the value 0 if the financial margin remains positively irrespective of any asset liquidation. The above specified dichotomous index serves as the dependent variable in our econometric model.

With regards to the independent variables we employ the same household demographic and financial characteristics with the Tobit model. In particular, the household's demographic characteristics include the gender of the household head, the marital status of the household head, the age, the educational level and the number of household members.

As to the financial attributes of the household's balance sheet, those include the amount of secured debt owned by the household, the amount of unsecured debt owned by the household, the amount of real estate assets owned, the income quantile that the household lies on, its employment status, whether the household owns a credit card and a self-reported measure of risk aversion.

Lastly, we incorporated a variable to measure possible peer effects that influence household's borrowing behaviour, i.e., the deviation of the net income of each household from the median net income educational level and age cohort that the household belongs.

3.6 Estimated Probit Model: Financial Fragility

We employed an index of financial fragility that takes into account potential liquidation of financial assets within a year. For the Probit analysis, we confined our sample to those households carrying debt, either secured or unsecured, as the definition of financial fragility we borrowed implies financial pressures due to yearly debt payments. Additionally, as income, typically being the largest component of the financial fragility index, by excluding non-indebted households we reduce information loss due to potential correlation between financial fragility and low income. Tables 11 and 12 report the results of the estimated Probit models.

The determinants of financial fragility lie largely on the opposite lines to those for indebtedness. With regards to age, in most countries of our household the younger the household head the greater the likelihood of facing financial pressures. Italy was found to be notable exception on this pattern with age presenting no significant influence on household's financial fragility. In the case of Spain, the households standing in the two extremes of the age distribution were found more likely to be financially fragile than those in the two extremes of the age distribution.

Regarding the level of secured and unsecured debt holdings, they were found to be positively associated with the index for financial fragility as expected. In all the cases we explored, secured debt is likely to bring more financial pressures to the household than unsecured debt.

Moreover, the higher the income quantile one stands, the less likely it is to face financial burdens. Interestingly, the relative standings, namely the deviation from the median income of its social group was shown to be a good determinant of financial fragility in all countries of our model. These results suggests that households lagging behind the incomes of their peers are more likely to become financially fragile, possibly in the process of catching up with the Joneses.

The level of real estate assets a household owns was found to be negatively associated with the likelihood of becoming financially fragile in all countries we looked at, but Greece. The gender, the marital status, the level of self-reported risk aversion, employment and credit card ownership were not shown to be robust explanatory variables for financial fragility in most countries of our sample.

4 Conclusion

Although the issues of household debt and its determinants have been thoroughly examined in both macroeconomic and microeconomic empirical studies, the number of researches using micro data is still limited. Since the mid 2000s and after the financial crisis of 2007-2008 a fragile economic and financial environment has been created with household debt reaching a historical level for many of the EU member states and specifically for those in the periphery. In this new unstable environment, central banks and other monetary and financial authorities in order to address the appropriate policies and stabilise economies and markets should take into consideration households debt holdings. In this context the need to assess the impact of the different determinants of the different types of households debt in a disaggregate manner is more crucial than ever before.

The present study used the 2010 HCFS data to gather cross-sectional information for the empirical determinants of household debt and financial fragility. The determinants of holding the two components of debt were estimated using binary Tobit models while the likelihood of financial fragility was estimated with a binary Probit regression. The predictor variables for both models consisted of age, income, employment, family size, financial and real assets, credit card ownership, educational qualification, and risk aversion and peer income effects based on education and age. With respect to the financial variables (income, taxes, real estate assets, financial assets and debt levels) the sum of all the members of the household is estimated.

Our evidence suggests that the propensity to borrow peaks for cohorts in the middle of the age distribution both for secured and unsecured debt holdings. Income was also found a very significant variable but its relative influence varied among countries. The size of the estimated coefficients of the employment variable indicates its important role in explaining the amount of debt. Family size and marriage were also positively associated with a greater likelihood of holding secured and unsecured debt. Our estimations also show that households

with lower levels of financial assets are more likely to hold more of unsecured and secured debt. When it comes to unsecured debt, our results show that real estate holdings is a significant determinant in all the countries of our sample.

With regards to financial pressures, our evidence suggests that households falling on the lower strands of the age distribution are particularly vulnerable to become financially fragile, even if they are provided with a long time horizon to liquidate their financial assets. Additionally, our study revealed that households that lag behind the income level of their peers, in terms of age and education, are more likely fall under debt burdens.

5 References

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6 Appendix

6.1 Descriptive Statistics Tables

Table 2: Descriptive Statistics: Portugal

Statistic	N	Mean	St. Dev.	Min	Max
Educational Level 1 (Primary or below)	4,404	0.627	0.484	0	1
Education Level 2 (Lower Secondary)	4,404	0.137	0.344	0	1
Education Level 3 (Upper Secondary)	4,404	0.132	0.338	0	1
Educational Level 4 (Tertiary or post-secondary)	4,404	0.104	0.305	0	1
Age of Household Head: 18 - 24 years	4,404	0.011	0.106	0	1
Age of Household Head: 25 - 34 years	4,404	0.068	0.252	0	1
Age of Household Head: 35 - 44 years	4,404	0.147	0.354	0	1
Age of Household Head: 45 - 54 years	4,404	0.203	0.402	0	1
Age of Household Head: 55 - 64 years	4,404	0.218	0.413	0	1
Age of Household Head: 65+ years	4,404	0.353	0.478	0	1
Female	4,404	0.320	0.466	0	1
Married	4,404	0.622	0.485	0	1
No. of Household Members	4,404	2.526	1.264	1	16
Income Quantile 1	4,404	0.250	0.433	0	1
Income Quantile 2	4,404	0.250	0.433	0	1
Income Quantile 3	4,404	0.249	0.433	0	1
Income Quantile 4	4,404	0.251	0.433	0	1
Amount of Real Estate held	4,404	165,822.400	634,692.900	0.000	24,118,750.000
Amount of Financial Assets held	4,404	22,410.520	95,234.110	0.000	4,433,000.000
Amount of Secured Debt held	4,404	14,667.820	37,229.670	0.000	610,000.000
Amount of Unsecured Debt held	4,404	1,400.480	7,056.707	0	150,000
Currently Employed	4,404	0.467	0.499	0	1
Own Credit Card	4,404	0.325	0.468	0	1
Risk Aversion 1	4,365	0.008	0.087	0	1
Risk Aversion 2	4,365	0.008	0.087	0	1
Risk Aversion 3	4,365	0.071	0.258	0	1
Own Credit Card	4,365	0.913	0.281	0	1
Peer Income Effect	4,404	-0.217	8.555	-12.794	10.454

Table 3: Descriptive Statistics: Italy

Statistic	N	Mean	St. Dev.	Min	Max
Educational Level 1 (Primary or below)	7,951	0.279	0.449	0	1
Education Level 2 (Lower Secondary)	7,951	0.278	0.448	0	1
Education Level 3 (Upper Secondary)	7,951	0.330	0.470	0	1
Educational Level 4 (Tertiary or post-secondary)	7,951	0.113	0.317	0	1
Age of Household Head: 18 - 24 years	7,951	0.007	0.086	0	1
Age of Household Head: 25 - 34 years	7,951	0.058	0.233	0	1
Age of Household Head: 35 - 44 years	7,951	0.154	0.361	0	1
Age of Household Head: 45 - 54 years	7,951	0.200	0.400	0	1
Age of Household Head: 55 - 64 years	7,951	0.212	0.409	0	1
Age of Household Head: 65+ years	7,951	0.369	0.483	0	1
Female	7,951	0.455	0.498	0	1
Married	7,951	0.623	0.485	0	1
No. of Household Members	7,951	2.495	1.257	1	12
Income Quantile 1	7,951	0.250	0.433	0	1
Income Quantile 2	7,951	0.250	0.433	0	1
Income Quantile 3	7,951	0.250	0.433	0	1
Income Quantile 4	7,951	0.250	0.433	0	1
Amount of Real Estate held	7,951	259,969.300	517,667.400	0.000	26,005,000.000
Amount of Financial Assets held	7,951	30,537.260	96,001.760	0.000	4,006,272.000
Amount of Secured Debt held	7,951	6,540.056	30,628.120	0.000	660,000.000
Amount of Unsecured Debt held	7,951	2,686.435	17,163.130	0.000	735,000.000
Currently Employed	7,951	0.426	0.495	0	1
Own Credit Card	7,951	0.320	0.467	0	1
Risk Aversion 1	7,951	0.010	0.102	0	1
Risk Aversion 2	7,951	0.185	0.388	0	1
Risk Aversion 3	7,951	0.316	0.465	0	1
Own Credit Card	7,951	0.489	0.500	0	1
Peer Income Effect	7,951	-0.205	8.935	-13.090	10.800

Table 4: Descriptive Statistics: Spain

Statistic	N	Mean	St. Dev.	Min	Max
Educational Level 1 (Primary or below)	6,197	0.320	0.467	0	1
Education Level 2 (Lower Secondary)	6,197	0.164	0.370	0	1
Education Level 3 (Upper Secondary)	6,197	0.171	0.377	0	1
Educational Level 4 (Tertiary or post-secondary)	6,197	0.345	0.475	0	1
Age of Household Head: 18 - 24 years	6,197	0.008	0.089	0	1
Age of Household Head: 25 - 34 years	6,197	0.054	0.226	0	1
Age of Household Head: 35 - 44 years	6,197	0.140	0.347	0	1
Age of Household Head: 45 - 54 years	6,197	0.195	0.396	0	1
Age of Household Head: 55 - 64 years	6,197	0.203	0.402	0	1
Age of Household Head: 65+ years	6,197	0.400	0.490	0	1
Female	6,197	0.446	0.497	0	1
Married	6,197	0.630	0.483	0	1
No. of Household Members	6,197	2.558	1.229	1	9
Income Quantile 1	6,197	0.250	0.433	0	1
Income Quantile 2	6,197	0.250	0.433	0	1
Income Quantile 3	6,197	0.250	0.433	0	1
Income Quantile 4	6,197	0.250	0.433	0	1
Amount of Real Estate held	6,197	976,718.400	6,481,014.000	0.000	391,419,294.000
Amount of Financial Assets held	6,197	204,779.100	1,227,633.000	0	35,150,000
Amount of Secured Debt held	6,197	29,121.490	145,014.200	0	8,500,000
Amount of Unsecured Debt held	6,197	12,817.650	219,564.200	0	10,500,000
Currently Employed	6,197	0.419	0.493	0	1
Own Credit Card	6,197	0.743	0.437	0	1
Risk Aversion 1	6,197	0.005	0.074	0	1
Risk Aversion 2	6,197	0.025	0.155	0	1
Risk Aversion 3	6,197	0.176	0.381	0	1
Own Credit Card	6,197	0.794	0.404	0	1
Peer Income Effect	6,197	-0.275	9.198	-15.981	10.978

Table 5: Descriptive Statistics: Greece

Statistic	N	Mean	St. Dev.	Min	Max
Educational Level 1 (Primary or below)	2,971	0.244	0.430	0	1
Education Level 2 (Lower Secondary)	2,971	0.132	0.338	0	1
Education Level 3 (Upper Secondary)	2,971	0.440	0.496	0	1
Educational Level 4 (Tertiary or post-secondary)	2,971	0.184	0.388	0	1
Age of Household Head: 18 - 24 years	2,971	0.186	0.389	0	1
Age of Household Head: 25 - 34 years	2,971	0.186	0.389	0	1
Age of Household Head: 35 - 44 years	2,971	0.232	0.422	0	1
Age of Household Head: 45 - 54 years	2,971	0.186	0.390	0	1
Age of Household Head: 55 - 64 years	2,971	0.132	0.338	0	1
Age of Household Head: 65+ years	2,971	0.200	0.400	0	1
Female	2,971	0.592	0.492	0	1
Married	2,971	0.600	0.490	0	1
No. of Household Members	2,971	2.605	1.282	1	11
Income Quantile 1	2,971	0.246	0.431	0	1
Income Quantile 2	2,971	0.254	0.435	0	1
Income Quantile 3	2,971	0.249	0.432	0	1
Income Quantile 4	2,971	0.251	0.434	0	1
Amount of Real Estate held	2,971	148,049.300	262,245.900	0.000	10,100,000.000
Amount of Financial Assets held	2,971	10,986.640	42,895.270	0	1,600,000
Amount of Secured Debt held	2,971	9,390.438	29,866.990	0	366,640
Amount of Unsecured Debt held	2,971	2,645.711	9,667.661	0	155,449
Currently Employed	2,971	0.513	0.500	0	1
Own Credit Card	2,971	0.225	0.417	0	1
Risk Aversion 1	2,971	0.028	0.164	0	1
Risk Aversion 2	2,971	0.043	0.203	0	1
Risk Aversion 3	2,971	0.176	0.381	0	1
Own Credit Card	2,971	0.753	0.431	0	1
Peer Income Effect	2,971	-0.184	8.844	-14.360	10.693

Table 6: Descriptive Statistics: Germany

Statistic	N	Mean	St. Dev.	Min	Max
Educational Level 1 (Primary or below)	3,565	0.009	0.094	0	1
Education Level 2 (Lower Secondary)	3,565	0.084	0.278	0	1
Education Level 3 (Upper Secondary)	3,565	0.522	0.500	0	1
Educational Level 4 (Tertiary or post-secondary)	3,565	0.385	0.487	0	1
Age of Household Head: 18 - 24 years	3,565	0.038	0.192	0	1
Age of Household Head: 25 - 34 years	3,565	0.102	0.302	0	1
Age of Household Head: 35 - 44 years	3,565	0.146	0.353	0	1
Age of Household Head: 45 - 54 years	3,565	0.211	0.408	0	1
Age of Household Head: 55 - 64 years	3,565	0.195	0.396	0	1
Age of Household Head: 65+ years	3,565	0.309	0.462	0	1
Female	3,565	0.448	0.497	0	1
Married	3,565	0.644	0.479	0	1
No. of Household Members	3,565	2.282	1.153	1	8
Income Quantile 1	3,565	0.249	0.432	0	1
Income Quantile 2	3,565	0.251	0.434	0	1
Income Quantile 3	3,565	0.250	0.433	0	1
Income Quantile 4	3,565	0.250	0.433	0	1
Amount of Real Estate held	3,565	326,353.100	1,308,438.000	0	62,750,000
Amount of Financial Assets held	3,565	77,227.500	288,690.800	0	13,555,000
Amount of Secured Debt held	3,565	37,983.090	108,655.400	0	1,800,000
Amount of Unsecured Debt held	3,565	3,892.715	19,487.150	0	362,000
Currently Employed	3,565	0.531	0.499	0	1
Own Credit Card	3,565	0.511	0.500	0	1
Risk Aversion 1	3,468	0.003	0.056	0	1
Risk Aversion 2	3,468	0.030	0.171	0	1
Risk Aversion 3	3,468	0.375	0.484	0	1
Own Credit Card	3,468	0.592	0.492	0	1
Peer Income Effect	3,565	-0.276	9.666	-13.850	11.056

6.2 Regression Results Tables

Table 7: Tobit Regression Results: Secured Debt

	<i>Dependent variable:</i>		
	Secured Debt		
	(Portugal)	(Spain)	(Italy)
Female	−0.153 (0.580)	0.216 (0.421)	−1.533** (0.769)
Married	0.450 (0.612)	1.780*** (0.501)	0.239 (1.002)
Age of Household Head 18 - 24 years	11.350*** (2.866)	5.718** (2.880)	9.736* (5.052)
Age of Household Head 25 - 34 years	15.647*** (1.087)	16.693*** (1.021)	17.986*** (1.932)
Age of Household Head 35 - 44 years	16.036*** (0.957)	15.133*** (0.817)	16.085*** (1.597)
Age of Household Head 45 - 54 years	12.454*** (0.886)	10.178*** (0.749)	12.678*** (1.518)
Age of Household Head 55 - 64 years	7.518*** (0.767)	6.426*** (0.669)	8.890*** (1.306)
Education Level 2	1.038* (0.616)	−0.675 (0.677)	0.398 (1.352)
Education Level 3	0.053 (0.684)	−0.204 (0.695)	−0.529 (1.459)
Educational Level 4	−0.461 (0.839)	−0.672 (0.747)	0.329 (1.737)
No. of Household Members	−0.270 (0.220)	0.480** (0.197)	0.637* (0.364)
Amount of Real Estate (Log)	3.862*** (0.212)	3.626*** (0.205)	6.015*** (0.407)
Amount of Financial Assets (Log)	−0.764*** (0.095)	−1.131*** (0.090)	−0.534*** (0.120)
Income Quantile 2	3.216*** (0.789)	3.521*** (0.758)	3.394** (1.451)
Income Quantile 3	3.912*** (0.942)	4.771*** (0.904)	3.986** (1.691)
Income Quantile 4	4.416*** (1.184)	4.328*** (1.187)	4.045* (2.139)
Currently Employed	0.384 (0.597)	2.270*** (0.508)	4.102*** (0.979)
Risk Aversion 1	−0.380 (2.826)	−2.069 (2.393)	−5.714* (2.988)
Risk Aversion 2	2.165 (2.143)	−4.803** (2.183)	−3.226 (2.934)
Risk Aversion 3	2.185 (2.055)	−4.076* (2.158)	−2.036 (2.932)
Own Credit Card	2.987*** (0.472)	4.106*** (0.652)	1.541* (0.803)
Peer Income Effect	0.010 (0.043)	0.026 (0.036)	−0.001 (0.071)
Constant	−57.628*** (3.408)	−54.666*** (3.470)	−103.307*** (6.288)
Observations	4,365	6,195	7,951
Log Likelihood	−5,046.533	−7,706.387	−4,243.452
Wald Test (df = 22)	931.072***	1,182.903***	453.686***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 8: Tobit Regression Results: Secured Debt

	<i>Dependent variable:</i>	
	Secured Debt	
	(Greece)	(Germany)
Female	1.175 (0.852)	-0.418 (0.511)
Married	4.279*** (1.062)	1.290* (0.671)
Age of Household Head 18 - 24 years	2.866 (3.073)	-0.960 (2.238)
Age of Household Head 25 - 34 years	7.837*** (1.847)	6.273*** (1.329)
Age of Household Head 35 - 44 years	6.033*** (1.814)	9.038*** (1.061)
Age of Household Head 45 - 54 years	7.502*** (1.763)	7.248*** (0.986)
Age of Household Head 55 - 64 years	4.229** (1.663)	5.407*** (0.854)
Education Level 2	0.212 (1.477)	2.089 (4.809)
Education Level 3	1.882 (1.349)	1.346 (4.736)
Educational Level 4	1.114 (1.582)	1.479 (4.789)
No. of Household Members	0.672* (0.391)	0.454* (0.257)
Amount of Real Estate (Log)	5.298*** (0.454)	4.663*** (0.226)
Amount of Financial Assets (Log)	-0.788*** (0.107)	-1.260*** (0.151)
Income Quantile 2	1.918 (1.411)	1.093 (0.997)
Income Quantile 3	2.967* (1.759)	1.125 (1.184)
Income Quantile 4	1.632 (2.250)	1.319 (1.528)
Currently Employed	1.166 (0.998)	2.820*** (0.727)
Risk Aversion 1	1.166 (2.653)	-2.421 (4.269)
Risk Aversion 2	0.301 (2.260)	-3.359 (4.074)
Risk Aversion 3	-1.042 (2.170)	-2.355 (4.075)
Own Credit Card	-0.418 (0.929)	1.501*** (0.565)
Peer Income Effect	0.023 (0.083)	-0.048 (0.048)
Constant	-82.074*** (6.324)	-54.981*** (6.624)
Observations	2,971	3,468
Log Likelihood	-2,609.566	-4,398.711
Wald Test (df = 22)	268.018***	721.341***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 9: Tobit Regression Results: Unsecured Debt

	<i>Dependent variable:</i>		
	Unsecured Debt		
	(Portugal)	(Spain)	(Italy)
Female	1.028* (0.622)	−0.888** (0.422)	−0.868* (0.462)
Married	−1.387** (0.650)	0.023 (0.495)	−0.829 (0.582)
Age of Household Head 18 - 24 years	9.748*** (2.054)	4.946** (2.018)	4.304* (2.353)
Age of Household Head 25 - 34 years	7.694*** (1.129)	6.461*** (0.948)	5.894*** (1.059)
Age of Household Head 35 - 44 years	7.020*** (1.005)	4.934*** (0.767)	6.168*** (0.865)
Age of Household Head 45 - 54 years	5.482*** (0.936)	4.137*** (0.714)	4.904*** (0.826)
Age of Household Head 55 - 64 years	4.842*** (0.820)	2.801*** (0.649)	4.049*** (0.712)
Education Level 2	−0.387 (0.722)	0.791 (0.640)	1.207* (0.708)
Education Level 3	−0.170 (0.791)	0.870 (0.680)	1.333* (0.794)
Educational Level 4	−1.541 (0.992)	−0.753 (0.747)	−0.812 (1.035)
No. of Household Members	1.337*** (0.220)	1.413*** (0.197)	1.667*** (0.218)
Amount of Real Estate (Log)	0.113 (0.075)	−0.038 (0.083)	0.313*** (0.105)
Amount of Financial Assets (Log)	−0.477*** (0.103)	−0.965*** (0.086)	−0.483*** (0.067)
Income Quantile 2	3.720*** (0.856)	3.487*** (0.694)	0.254 (0.728)
Income Quantile 3	5.637*** (1.078)	3.455*** (0.880)	0.798 (0.935)
Income Quantile 4	5.051*** (1.370)	4.040*** (1.176)	1.665 (1.245)
Currently Employed	−0.335 (0.646)	0.735 (0.511)	2.600*** (0.579)
Risk Aversion 1	2.873 (3.409)	0.085 (2.642)	−6.064*** (1.808)
Risk Aversion 2	1.389 (2.691)	−2.479 (2.429)	−3.774** (1.773)
Risk Aversion 3	1.179 (2.586)	−3.214 (2.402)	−2.896 (1.766)
Own Credit Card	6.260*** (0.557)	6.111*** (0.624)	3.621*** (0.515)
Peer Income Effect	0.009 (0.049)	0.020 (0.037)	−0.007 (0.043)
Constant	−21.311*** (2.927)	−9.965*** (2.703)	−18.931*** (2.182)
Observations	4,365	6,195	7,951
Log Likelihood	−4,061.814	−7,109.017	−7,175.273
Wald Test (df = 22)	408.908***	626.904***	545.511***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 10: Tobit Regression Results: Unsecured Debt

	<i>Dependent variable:</i>	
	Unsecured Debt	
	(Greece)	(Germany)
Female	0.292 (0.442)	-0.559 (0.398)
Married	-0.337 (0.542)	-0.704 (0.501)
Age of Household Head 18 - 24 years	-0.356 (1.350)	4.159*** (1.138)
Age of Household Head 25 - 34 years	4.139*** (0.981)	7.472*** (0.853)
Age of Household Head 35 - 44 years	2.644*** (0.982)	5.515*** (0.827)
Age of Household Head 45 - 54 years	2.447** (0.973)	5.952*** (0.773)
Age of Household Head 55 - 64 years	1.802* (0.924)	4.519*** (0.696)
Education Level 2	1.836** (0.820)	4.944** (2.490)
Education Level 3	1.584** (0.755)	5.339** (2.434)
Educational Level 4	-0.373 (0.873)	4.227* (2.492)
No. of Household Members	0.676*** (0.211)	0.799*** (0.208)
Amount of Real Estate (Log)	0.195*** (0.075)	-0.071 (0.060)
Amount of Financial Assets (Log)	-0.362*** (0.058)	-0.784*** (0.097)
Income Quantile 2	1.115 (0.709)	1.381** (0.648)
Income Quantile 3	1.552* (0.914)	2.114** (0.871)
Income Quantile 4	2.065* (1.186)	-0.014 (1.180)
Currently Employed	1.631*** (0.545)	1.474*** (0.535)
Risk Aversion 1	1.094 (1.452)	-1.370 (3.399)
Risk Aversion 2	0.603 (1.232)	-1.223 (3.242)
Risk Aversion 3	-0.817 (1.184)	-2.031 (3.237)
Own Credit Card	11.023*** (0.509)	1.510*** (0.454)
Peer Income Effect	0.011 (0.045)	0.019 (0.038)
Constant	-14.078*** (1.679)	-6.249 (3.912)
Observations	2,971	3,468
Log Likelihood	-3,654.762	-5,131.314
Wald Test (df = 22)	674.083***	404.380***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 11: Financial Fragility Probit: Portugal, Spain and Italy

	<i>Dependent variable:</i>		
	Financially Fragile		
	(Portugal)	(Spain)	(Italy)
Female	0.031 (0.135)	0.041 (0.083)	-0.090 (0.121)
Married	-0.071 (0.144)	-0.200** (0.095)	-0.191 (0.151)
Age	-0.050* (0.028)	-0.089*** (0.022)	-0.012 (0.030)
Age Squared	0.042 (0.028)	0.072*** (0.021)	-0.007 (0.029)
Education Level 2	-0.309** (0.139)	-0.507*** (0.124)	-0.431** (0.185)
Education Level 3	-0.755*** (0.179)	-0.676*** (0.132)	-0.717*** (0.212)
Educational Level 4	-0.766*** (0.256)	-1.136*** (0.152)	-0.963*** (0.286)
No. of Household Members	-0.009 (0.052)	-0.048 (0.038)	0.108** (0.049)
Amount of Secured Debt (Log)	0.107*** (0.017)	0.103*** (0.011)	0.084*** (0.016)
Amount of Unsecured Debt (Log)	0.078*** (0.016)	0.091*** (0.011)	0.070*** (0.019)
Amount of Real Estate (Log)	-0.056** (0.022)	-0.072*** (0.019)	-0.070** (0.028)
Income Quantile 2	-1.007*** (0.148)	-0.907*** (0.123)	-1.498*** (0.147)
Income Quantile 3	-2.138*** (0.218)	-1.827*** (0.168)	-2.657*** (0.223)
Income Quantile 4	-2.816*** (0.326)	-1.854*** (0.240)	-3.048*** (0.368)
Currently Employed	0.074 (0.132)	-0.029 (0.095)	0.088 (0.149)
Risk Aversion 1	1.698* (0.919)	0.081 (0.508)	-0.469 (0.423)
Risk Aversion 2	0.364 (0.820)	-0.642 (0.474)	-0.643 (0.413)
Risk Aversion 3	0.546 (0.798)	-0.199 (0.461)	-0.567 (0.409)
Own Credit Card	-0.155 (0.110)	-0.521*** (0.114)	-0.130 (0.129)
Peer Income Effect	0.027** (0.011)	0.057*** (0.008)	0.054*** (0.011)
Constant	1.156 (1.053)	4.002*** (0.729)	2.397*** (0.855)
Observations	1,574	2,451	1,794
Log Likelihood	-385.571	-643.968	-353.093
Akaike Inf. Crit.	813.142	1,329.937	748.186

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 12: Financial Fragility Probit

	<i>Dependent variable:</i>	
	Financial Fragility Probit: Greece and Germany	
	(Greece)	(Germany)
Female	0.069 (0.150)	0.039 (0.121)
Married	-0.436** (0.186)	-0.079 (0.150)
Age	-0.062* (0.037)	-0.054* (0.030)
Age Squared	0.047 (0.039)	0.032 (0.030)
Education Level 2	-0.757*** (0.265)	-0.290 (0.847)
Education Level 3	-0.957*** (0.250)	-0.668 (0.840)
Educational Level 4	-1.356*** (0.309)	-0.829 (0.857)
No. of Household Members	-0.033 (0.071)	-0.077 (0.069)
Amount of Secured Debt (Log)	0.122*** (0.020)	0.089*** (0.018)
Amount of Unsecured Debt (Log)	0.073*** (0.024)	0.061*** (0.021)
Amount of Real Estate (Log)	-0.002 (0.027)	-0.075*** (0.018)
Income Quantile 2	-1.449*** (0.178)	-1.800*** (0.150)
Income Quantile 3	-2.635*** (0.292)	-2.571*** (0.272)
Income Quantile 4	-2.611*** (0.451)	-5.942 (98.228)
Currently Employed	-0.227 (0.168)	-0.257* (0.144)
Risk Aversion 1	-0.710* (0.428)	0.384 (0.851)
Risk Aversion 2	-0.418 (0.358)	0.836 (0.786)
Risk Aversion 3	-0.710** (0.345)	1.107 (0.779)
Own Credit Card	-0.415*** (0.158)	-0.201 (0.133)
Peer Income Effect	0.068*** (0.017)	0.042*** (0.013)
Constant	3.182*** (0.863)	2.113* (1.197)
Observations	1,121	1,712
Log Likelihood	-219.861	-278.175
Akaike Inf. Crit.	481.722	598.351

Note:

*p<0.1; **p<0.05; ***p<0.01