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## The impact of income inequality on household indebtedness in euro area countries

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# The Impact of Income Inequality on Household Indebtedness in Euro Area Countries

Stefan Jestl





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# Abstract

This paper examines the impact of income inequality on consumption-related household indebtedness at the household level. Using the first wave of the Eurosystem Household Finance and Consumption Survey data, the analysis sheds light on heterogeneous effects across euro area countries. The results suggest a positive impact of income inequality on consumption-related household indebtedness in a small sample of countries. We further employ a multilevel regression model to also take country's macroeconomic characteristics into account, such as credit market and welfare state design. In this setting, we find an overall positive impact of income inequality on consumption-related household indebtedness.

**Keywords:** Income Inequality, Keeping Up With The Joneses, Household Indebtedness, Euro Area

**JEL classification:** D12, D14, D31



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# 1 Introduction

*“Debt is a two-edged sword. Used wisely and in moderation, it clearly improves welfare. But, when it is used imprudently and in excess, the result can be disaster. For individual households and firms, overborrowing leads to bankruptcy and financial ruin.”* (Cecchetti, Mohanty, and Zampolli, 2011). The evolution of household indebtedness and its roots have been on the agenda of the economic discussion in the aftermath of the global financial and economic crisis. In some European countries, households had increased their debt remarkably in the pre-crisis period which fuelled the risk of over-indebtedness of households. This raised the question as to why households generally take on debt and what are the underlying mechanisms that are in play in the background.

In the post-crisis period, a strand in the economic literature has emerged that debates the relationship between income inequality and household indebtedness<sup>1</sup>. Among others, Stockhammer (2015), Morelli and Atkinson (2015) and Treeck (2014) argue that rising income inequality had been associated with the surge of household indebtedness in the pre-crisis period and that eventually led to macroeconomic instabilities. Individuals that felt lagging behind were induced to take out loans in order to increase consumption and to keep up with individuals higher ranked in the income distribution. Income inequality may therefore foster unsustainable household indebtedness (see Dabla-Norris et al., 2015).

Over the last decade, a growing amount of empirical studies investigated the impact of income inequality on household indebtedness at the country level (for an overview of empirical studies see Bazillier and Hericourt, 2017). The results are however rather mixed and inconclusive. In contrast, the empirical evidence on the impact of income inequality on borrowing behaviour at the household level is scarce. Georgarakos, Haliassos, and Pasini (2014) presented robust effects on borrowings, particularly for those who consider themselves poorer than their reference group, using Dutch household survey data. Similarly, Berlemann and Salland (2016) examined peer effects based on regional average incomes on debt market participation by using cross-sectional private customer data from a German savings bank. Their findings suggest a positive effect of income inequality on the financial behaviour of individuals. In addition, Brown, Ghosh, and Taylor (2016) used British Household Panel Survey data (1995, 2000, 2005) and based their social interaction measure on responses to a number of questions concerning group memberships. They found a positive effect of social interactions on household financial decisions. In contrast, Coibion, Gorodnichenko, Kudlyak, and Mondragon (2014) found evidence for the reversed relationship. They used US quarterly panel data over the course of 2001 to 2012 and found that debt leverage was relatively higher for high-income households in high-inequality areas compared with lower-inequality areas. Likewise, Loschiavo (2016) provided evidence for the predominant importance of supply factors compared to demand factors for the probability of being indebted using panel survey data for Italian households. In regions with high income inequality, financial institutions tend to give loans to richer households since a household’s income might be regarded as a reliable criterion for creditworthiness.

By discussing the existing empirical literature, we identify two important patterns: First, the ma-

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<sup>1</sup>Some studies already addressed the nexus between income inequality and household indebtedness in the pre-crisis period (see, for example, Barba and Pivetti, 2008; Palley, 2002).

majority of empirical studies focus on the total amount of debts. Although some studies distinguish between collateralised and non-collateralised debts, none of them focus on consumption-related debts. However, according to theoretical arguments, consumption-related debts in particular are crucial for the nexus between income inequality and household indebtedness. Second, empirical studies at the micro-level are focused solely on individual countries. Thus, differences in data sources and availability make it difficult to compare effects across countries. Moreover, focusing on individual countries does not allow countries' macroeconomic characteristics in the empirical analysis to be considered, that can also be relevant for taking out loans.

This paper explores the impact of income inequality on household indebtedness at the household level and uses the Eurosystem Household Finance and Consumption Survey (HFCS<sup>2</sup>) for 2010. Specifically, we empirically test the hypothesis, that a higher exposure to income inequality for households is associated with a higher consumption-related household indebtedness. Since the data cover euro area countries, the analysis allows us to compare effects and to shed light on heterogeneous effects across continental European countries. Using a set of countries, further allows us to take into account countries' macroeconomic characteristics, such as the size of credit market and the welfare state regime, that appear to be crucial for the opportunity and/or necessity to take on debt.

The remainder of this paper is structured as follows: Section 2 discusses the relationship between income inequality and household indebtedness from a theoretical point of view. Section 3 describes the data used in this study, while Section 4 describes the empirical strategy. Section 5 focuses on the results of the empirical analysis and Section 6 provides robustness checks. Finally, Section 7 concludes.

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<sup>2</sup>Fieldwork took place between 2007 and 2010. We only use the first wave of the HFCS, because we want to focus on the pre-crisis period.

## 2 Income Inequality & Household Indebtedness

Finance is basically considered as necessary and beneficial for economic development. Debts offer individuals and households the opportunity to consume and to invest, even in periods with lower income. Borrowings therefore allow individuals and households to make intertemporal decisions, as they are interested in smoothing their consumption paths and prefer to pull forward investment decisions. From this perspective, transitory income shocks, for example due to unemployment, are likely to be dampened by increased borrowings (see Treck, 2014; Krueger and Perri, 2006). According to the life-cycle model of Modigliani (1986) and the permanent-income hypothesis of Friedman (1957), households maximise their utility by smoothing consumption over their lifetime. In periods of low income relative to average income, households raise debts to finance current consumption. Loans thus appear to be a rational answer to temporary income shocks.

The relative income hypothesis, initially put forward by Duesenberry (1967), allows to address the link between indebtedness and household behaviour from a different perspective. In principle, this hypothesis underlines that the household's savings rate (and thus also the consumption rate) is not influenced by the absolute level of income, rather, it represents an increasing function of the household's position in the income distribution within a reference group.<sup>3</sup> This argument implies that preferences are not independent from other individuals, as initially proposed by Veblen (1899). Hence, it is assumed that individuals make comparisons with other individuals and derive their utility not only from their own absolute income, but also from the income of a reference group (see Verme, 2013). The hypothesis primarily predicts effects on consumption, since it is conspicuous consumption that is eventually visible for individuals. In this context, consumption might be seen as a social status, where low-income and middle-income households want to keep up with higher-income households and take on debt. The *expenditure cascade* approach by Frank, Levine, and Dijk (2014) argues in a similar vein. Higher expenditures by higher-income households make poorer households spend more, influencing the even poorer households, and so on. In this respect, permanent income differences between households as reflected in a higher income inequality are therefore directly linked to higher household indebtedness.

In contrast, Coibion, Gorodnichenko, Kudlyak, and Mondragon (2014) argue that income inequality may reflect a supply-side mechanism rather than a demand-side mechanism. Income inequality may affect the credit supply of the banking system to households, since it works as a signalling for credit risk. In the case of a high level of income inequality, incomes are stronger signals of credit worthiness. This, however, implies that income inequality is more likely to be associated with a lower (higher) indebtedness of lower (higher) income households.

In general, in order to meet the demand for credit, the supply-side of the credit market plays an essential role. The general institutional features of the credit supply-side affects indebtedness because constraints on the ability of households to raise debts are imposed (see Bazillier and Hericourt, 2017). As a consequence of the process of financial liberalisation, the easing of credit constraints on households had started (see Debelle, 2004). That allowed households to increase their borrowings steadily, particularly in the Anglo-Saxon countries, namely the United States and

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<sup>3</sup>The hypothesis further states that there exists a relation of the household's current to past income (see Brown, 2008).

the United Kingdom. According to Rajan (2011), the financial liberalisation in the US had been induced by political authorities to relieve debt-financed household consumption and to dampen the negative impact of an increased income inequality on aggregate demand. In contrast, Fitoussi and Saraceno (2010) argued that credit markets in continental Europe had generally been more restrictive, which constrained households from taking on debt.

### 3 Data

In this study, we use the Eurosystem Household Finance and Consumption Survey for the year 2010 that was originally conducted in 15 euro area countries comprising Austria (AT), Belgium (BE), Cyprus (CY), Finland (FI), France (FR), Germany (DE), Greece (GR), Italy (IT), Luxembourg (LU), Malta (MT), the Netherlands (NL), Portugal (PT), Spain (ES), Slovakia (SK) and Slovenia (SI). The HFCS is a household level dataset and provides information about household gross income, household wealth as well as different household debt positions such as collateralised and non-collateralised debt. The gross household income consists of income (from work, capital and property) including monetary transfers but does not consider any type of taxes. As concerns wealth, we can distinguish between household main residences, other real estate properties, self-employment businesses and financial assets. Furthermore, debts are split into collateralised and non-collateralised debts. In the case of loans the reasons for borrowings are available. In this analysis, we are primarily focused on debt positions that are associated with “conspicuous” consumption. We therefore consider collateralised and non-collateralised loans with the main purpose “to cover living expenses and other purchases”, “to consolidate other consumption debt” and “to buy vehicle or other means of transport”<sup>4</sup>. Moreover, we add *outstanding credit lines* to our considered debt positions. In the following, we always refer to this definition of consumer debts. The data for Finland do not include information on the purpose of borrowing. Additionally, data for Malta is limited, for example age is only available in brackets. Due to these data limitations<sup>5</sup>, we exclude FI and MT from our analysis.

In order to avoid missing values, the dataset works with five implicates. For each implicate, values for specific variables were estimated by using an imputation technique with an iterative and sequential structure. In order to ensure the representativeness of the data, the HFCS provides household weights. Moreover, a set of replicate weights is available to account for uncertainties regarding the sample design. We take both into account in our estimation procedure.

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<sup>4</sup>Other purposes for taking out loans: “to purchase the household main residence”, “to purchase another real estate asset”, “to refurbish or renovate the residence”, “to finance a business or professional activity” and “for education purposes”.

<sup>5</sup>Despite the extensive harmonisation in the applied methodology in the HFCS, some differences in the data production across countries need to be considered (see Fessler and Schürz, 2013). Fieldwork took place between 2007 and 2010. In addition, there are also differences in sampling designs and survey methods applied across countries. The typically applied survey mode was Computer Assisted Personal Interviews (CAPI). However, CY, NL and FI, as well as partly IT and MT, applied other survey methods. In BE, DE, GR, NL, FR, IT, LU, SI and SK other data sources were also used for income and public pension plans data (see Finance and Network, 2013).

**Table 1** – Descriptive Statistics – Consumer Debts

Country	Households with consumer debts, in %	Share of total debts, in %	Mean of consumer debts, in EUR
<i>AT</i>	16.6	5.7	5,718
<i>BE</i>	17.1	4.8	8,456
<i>CY</i>	35.5	7.7	15,384
<i>DE</i>	29.3	7.3	6,757
<i>ES</i>	16.5	6.6	13,121
<i>FR</i>	26.8	7.4	6,901
<i>GR</i>	16.0	12.8	9,585
<i>IT</i>	12.3	7.4	7,114
<i>LU</i>	30.1	4.9	13,205
<i>NL</i>	25.4	3.7	11,882
<i>PT</i>	11.6	4.9	7,437
<i>SI</i>	32.5	26.2	4,279
<i>SK</i>	11.0	5.4	1,624

*Note:* Debts in this table refer to consumer debts. The third column shows the share of consumer debts relative to total debts in countries.

*Source:* HFCS (2010).

Table 1 presents summary statistics about consumer debts in the euro area countries. The second column shows the share of households with consumer debts. Here, we can identify quite heterogeneous shares across the countries, ranging from 11.0% in Slovakia to 35.5% in Cyprus. In addition, those numbers reveal that the majority of households do not hold consumer debts. Moreover, we find that consumer debts are rather small compared to other type of debts, as indicated by the third column. With the exceptions of Slovenia and Greece, consumer debts account for less than 10% of total debts. The larger part of total debts can be ascribed to investment debts such as loans to purchase assets. The largest amounts of consumer debts, on average, can be found in Cyprus, Spain, Luxembourg and the Netherlands. In contrast, we observe smaller values in Slovakia, Slovenia and Austria. This implies that the number of indebted households is not necessarily associated with the average debt amount.

## 4 Empirical Strategy

In this analysis, we examine the impact of income inequality on the borrowing behaviour of households. In doing so, we take into account demand-side and supply-side factors that are important for household indebtedness. In our baseline model, we estimate the specification in the following form, separately for a country  $c$ :

$$Debt_i = RD_i\theta + GHI_i\phi + \mathbf{X}_i'\boldsymbol{\beta} + \epsilon_i, \quad (1)$$

where  $Debt_i$  denotes either a debt ownership dummy or the outstanding amount of consumer debts of household  $i$ ;  $\mathbf{X}_i$  is a  $k \times 1$  vector containing a set of explanatory variables;  $RD_i$  represents the measure of income inequality – *relative deprivation* – and  $GHI_i$  is the own absolute household’s gross income for household  $i$ . The remaining  $\epsilon_i$  is the error term.

The explanatory variable of main interest  $RD_i$  aims at capturing the exposure to income inequality of household  $i$  with respect to a reference group. Unlike the approach of Georgarakos, Haliassos, and Pasini (2014), we cannot apply direct information about a reference group. Moreover, our dataset does not provide information on regions within countries. We therefore use the entire society within a country and so all households in the same country as the reference group in our specification.<sup>6</sup> As proposed by the notion of the *relative income hypothesis* and the *expenditure cascade*, we assume that households make comparisons in particular with higher-income households<sup>7</sup>. Following Yitzhaki (1979) and Stark (1984), we compute the *relative deprivation* — a measure of relative income — for each household by comparing household  $i$ ’s income with those of all households with a higher income ( $j$ ) in a country:

$$RD_i = \frac{1}{N} \sum_{j=i+1}^N (y_j - y_i), \quad (2)$$

where households are sorted by their equivalised household gross income  $y$  in ascending order. We apply the OECD equivalence scale to compute the equivalised household gross income. The higher the relative deprivation for a household  $i$ , the higher the exposure to income inequality for household  $i$ , since a high RD reflects a large average income distance between households in a country<sup>8</sup>.

There is a rich volume of literature on problems when estimating social interactions (for example see Moffitt, 2001; Manski, 2000). As stressed by Georgarakos, Haliassos, and Pasini (2014), we have to deal with two main issues in our setting. First, income inequality may simply reflect, holding other factors constant, a transitory income shock. In that case, economic theory would predict that households take out debts to compensate for income instability and to smooth con-

<sup>6</sup>We acknowledge that this is a drawback of the study as the literature underscores, for instance, the role of small neighbourhoods for making comparisons (for example see Luttmer, 2005; Clark, Westergård-Nielsen, and Kristensen, 2009). We also estimate specifications, where we apply educational attainment groups and age cohorts of the household head as reference groups. For those types of RD measures we however found weaker results with a lower level of significance.

<sup>7</sup>In the robustness checks (see Section 6), we also test a measure for income inequality where households compare themselves with an *average* household.

<sup>8</sup>In this context, we assume that especially the levels of income inequality are crucial for the microeconomic mechanisms explained above, instead of the changes in income inequality. For a discussion on the “level” and “change” hypothesis see Morelli and Atkinson (2015).



sumption. To control for transitory income shocks, we use information about the employment within the household, future income expectations, and whether the income in the reference period was regarded as “low”. Second, unobserved factors that affect both borrowing behaviour and relative income result in a spurious relationship between the two observed variables. Such an omitted variable can cause a bias in our estimates. In order to minimise the impact of such a bias, we also apply an instrumental variable estimation (see Section 5.1.1).

Treec (2014) quotes strategies along with indebtedness which intend to cope with a lower relative income. Individuals may increase their working hours or households their participation rate in the labour market to increase their own as well as relative income. To take this possibility into account, we control for the employment and the number of individuals with more than one job within the household. As a further coping strategy, households can use their savings to afford spending. To take this into account, we add a dummy to our model that indicates whether a household has a savings account or not. Households may further have the possibility to use sources of informal credit via relatives or friends. To consider this channel of raising debts, we use information in the survey whether households had the “*ability to get financial assistance from friends or relatives.*” Moreover, we add a dummy variable that captures the past receipt of an inheritance. Karagiannaki (2017) provided evidence that households, particularly at the lower part of the wealth distribution, tend to reveal a higher propensity to consume out of the inherited wealth. This would imply a lower propensity to take on debt for those households.

In addition, we consider standard explanatory variables in our specification: age of household’s head and its squared term, dummies for education attainment of the household head as well as dummies for female household head and married household head. To control for the household structure, we use the number of children and adults in the household, as well as the age and educational attainment differences within a household (i.e. max and min comparison within the household). We further use real estate and financial assets of households to proxy the creditworthiness of households. Moreover, we add a dummy variable for liquidity constrained households, as was done by Le Blanc, Porpiglia, Zhu, and Ziegelmeier (2014) using the HFCS dataset. In doing so, we create a dummy variable that indicates whether net assets are worth less than six months’ gross household income.

Since the amount of outstanding debts as well as some continuous explanatory variables are characterised by a large number of zero values, we apply the inverse-hyperbolic-sine (ihs) transformation instead of a typical logarithmic transformation.<sup>9</sup>

Bazillier and Hericourt (2017) and Bover et al. (2016) stress the role of national institutions and legal processes for the financial development and credit supply. In order to use institutional and other country-specific characteristics, we pool countries together, but consider the structure in the data. In doing so, we employ a multilevel regression model that allows incorporating the hierarchy of the data and combining micro and macro variables appropriately in one regression model (see Gelman and Hill, 2007). Specifically, a two-level model is applied, where households are nested in countries:

$$Debt_{ic} = RD_{ic}\theta + GHI_{ic}\phi + \mathbf{X}_{ic}'\boldsymbol{\beta} + \mathbf{U}'_c\boldsymbol{\delta} + \nu_c + \epsilon_{ic}, \quad (3)$$

where  $i$  is a household in country  $c$ .  $Debt_{ic}$ ,  $RD_{ic}$  and  $\mathbf{X}_{ic}$  are defined as in Specification 1.

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<sup>9</sup> $ihs(y) = \ln(y + \sqrt{y^2 + 1})$ ; see for example Burbidge, Magee, and Robb (1988)

Additionally,  $\mathbf{U}_c$  includes country-level explanatory variables ( $l \times 1$  vector).  $\nu_c$  and  $\epsilon_{ic}$  are the error terms corresponding to the country and the household level respectively.

As country-specific covariates in  $\mathbf{U}_c$  we consider domestic credit to the private sector<sup>10</sup> as a percentage of GDP to capture the general size of the financial and credit market, public social expenditure as a percentage of GDP<sup>11</sup> to control for differences in the welfare state regimes and the index of residential property<sup>12</sup> to catch the general development in national housing markets. We further add the real long-run interest rate to control for the general interest environment for borrowing<sup>13</sup>. All country-level variables are average values between 2005 and 2010.

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<sup>10</sup>Data available from the World Bank.

<sup>11</sup>Data available from OECD.

<sup>12</sup>Data available from the Bank of International Settlement: [https://www.bis.org/statistics/pp\\_selected.htm](https://www.bis.org/statistics/pp_selected.htm). Indices are based on nominal values.

<sup>13</sup>Data available from Eurostat.

## 5 Results

In this analysis, we investigate the impact of income inequality on the borrowing behaviour of households. From a demand-side perspective, economic theory suggests a positive impact of income inequality on borrowing decisions, given that we control for transitory income shocks and other households' and individuals' characteristics, that might have an impact on financial decisions. Contrary to this, income inequality might reflect a supply-side impact on household indebtedness, indicating a signal for a household's credit worthiness. This is more likely to be associated with a negative impact of income inequality on household indebtedness, in particular, at the lower part of income distribution. In what follows, we take a look at the relationship under consideration by each country separately. Afterwards, we also take country-specific credit supply characteristics into account, which allows us to shed more light on the interplay between credit demand and credit supply factors.

### 5.1 Country-specific Regressions

First, we evaluate the impact of income inequality on the likelihood of credit market participation. In doing so, we estimate Specification 1, where the dependent variable indicates the ownership of consumer debts. The results of the Probit model for the full set of included explanatory variables are shown in Table 2. We start by discussing the results of the additional explanatory variables.

The average marginal effect of the absolute own households' income is positive, however, not statistically different from zero in most countries. On average, a higher absolute income induces households to raise debts in France, Portugal, Slovakia and slightly in Belgium. The age of the household's head has a predominantly negative impact on being indebted. Thus, the average marginal effect for the household's head age and its squared term is negative. The older the household's head, the lower the likelihood of taking out consumer debts. Likewise, households with a female household head are characterised by having a lower likelihood of holding consumer debts. Education does not seem to play a major role for being indebted, since most estimates are not statistically different from zero, even at a 10% significance level. We further cannot find a clear pattern in the results for the educational attainment levels. In addition, age differences and differences in the educational attainment within the household are irrelevant for the decision to take on consumer debts. If the household head is married this has a predominantly negative influence on debts, with exception of the Netherlands, where we find a statistically significant positive effect. The number of adults as well as number of children within a household have only an influence in some countries. In Spain, Italy, Luxembourg and Slovenia, an additional adult living in a household increases the probability of holding consumer debts, while it is only in France where the probability decreases with a higher number of adults. As concerns the number of children, the probability increases in Belgium, Greece and Italy but falls in Slovakia. The dummy capturing inheritances received also reveals a heterogeneous pattern in the effects on consumer debts. Although we find statistically significant negative impacts in Belgium, Spain and Greece, there seems to be a positive influence in Austria. On average, the receipt of an inheritance therefore tends to reduce the propensity of a household to raise consumer debts, *ceteris paribus*. Such a negative effect corresponds to the mechanism that households might consume out of the inherited wealth, instead of saving it. The results for the ownership of a savings account are characterised by a heterogeneous pattern as well. While we observe positive effects in Austria, France and Italy, negative effects prevail, on

average, in Luxembourg and Slovenia. When a self-employed individual lives in the household, the likelihood for holding consumer debt increases in Austria and Cyprus, however decreases in France and Luxembourg. Interestingly, the employment intensity within a household seems to only have a small impact on the likelihood to take out consumer debts. Although we find a positive influence in most countries, those effects are rather weak.

The source of informal credit has a statistically significantly negative impact on the likelihood of holding consumer debts in Austria, Germany and the Netherlands. Financial assistance from relatives and friends therefore acts as a substitution for taking on debts via formal credit supply channels. Furthermore, our controls for transitory income shocks exhibit, as suggested by economic theory, a consistent pattern of positive effects on the probability to raise debts. When temporary shocks or even expectations of such shocks hit a household, the likelihood of taking on debts increases. These results are in line with the assumption that households prefer to smooth consumption. In order to balance temporary income instabilities, households take on debts to keep consumption at a certain level.

The variables in the last three rows in Table 2 take into account households' wealth stock. The results suggest that households with a low level of net assets are more likely to take on consumer debts. We find a statistically significant influence on the probability of holding consumer debts in Austria, Germany, France, Greece, Italy, Portugal and Slovakia. These results might also correspond to the coping strategies as outlined by Treeck (2014). When liquid assets and savings are low, *ceteris paribus*, households are more willing to take on consumer debts. Moreover, the results for financial assets show a clear pattern. Financial assets are associated with a lower likelihood of taking on consumer debts. Contrary to this finding, real assets reduce the likelihood in Belgium and Slovakia, while increase it in France, Greece, Italy and Slovenia.

Table 2 – Probit Regressions

Dependent variable:	Pr(debt > 0)												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Relative deprivation, ihs-transformed</i>	0.032 (0.055)	0.067 (0.053)	-0.018 (0.077)	0.055 (0.085)	-0.007 (0.068)	0.192 (0.063)	-0.033 (0.024)	-0.002 (0.013)	-0.011 (0.057)	-0.018 (0.027)	0.082 (0.037)	0.157 (0.058)	-0.030 (0.019)
<i>Gross income, ihs-transformed</i>	0.055 (0.060)	0.066 (0.044)	0.028 (0.090)	0.023 (0.081)	0.009 (0.029)	0.172 (0.046)	0.005 (0.023)	0.001 (0.013)	0.042 (0.041)	-0.013 (0.038)	0.110 (0.035)	0.266 (0.090)	0.001 (0.008)
<i>Age household head</i>	-0.002 (0.001)	0.001 (0.001)	-0.006 (0.002)	-0.004 (0.001)	-0.003 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.005 (0.002)	-0.005 (0.002)	-0.003 (0.001)	-0.001 (0.001)	-0.006 (0.002)
<i>Female household head</i>	-0.003 (0.020)	0.018 (0.021)	-0.063 (0.041)	-0.040 (0.023)	0.004 (0.017)	-0.006 (0.012)	-0.013 (0.019)	-0.037 (0.009)	-0.033 (0.035)	0.000 (0.041)	-0.025 (0.017)	-0.014 (0.016)	-0.095 (0.037)
<i>Primary educ or below</i>	0.349 (0.225)	-0.060 (0.058)	0.048 (0.103)	-0.053 (0.154)	-0.008 (0.023)	-0.037 (0.024)	-0.040 (0.032)	-0.006 (0.019)	-0.166 (0.067)	0.090 (0.111)	0.007 (0.020)	-	-
<i>Upper secondary educ</i>	0.066 (0.029)	0.013 (0.033)	0.078 (0.076)	0.026 (0.039)	0.003 (0.024)	0.023 (0.023)	0.018 (0.030)	-0.008 (0.013)	-0.117 (0.058)	0.008 (0.045)	0.029 (0.019)	0.142 (0.098)	0.023 (0.057)
<i>Tertiary educ</i>	0.013 (0.041)	0.004 (0.033)	0.090 (0.074)	-0.018 (0.053)	0.015 (0.027)	-0.039 (0.024)	-0.033 (0.034)	-0.006 (0.022)	-0.208 (0.071)	-0.038 (0.052)	0.015 (0.025)	0.094 (0.101)	0.013 (0.068)
<i>Age diff. within HH</i>	0.000 (0.001)	0.000 (0.001)	-0.001 (0.002)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	0.002 (0.001)	0.000 (0.002)
<i>Educ diff. within HH</i>	0.005 (0.014)	0.021 (0.012)	-	-0.011 (0.011)	0.009 (0.007)	0.013 (0.006)	0.017 (0.010)	0.003 (0.007)	0.026 (0.018)	-0.009 (0.018)	-0.007 (0.006)	0.012 (0.012)	-0.018 (0.022)
<i>Married household head</i>	-0.049 (0.024)	-0.017 (0.025)	-0.021 (0.054)	-0.023 (0.032)	0.009 (0.022)	0.020 (0.015)	-0.010 (0.024)	-0.003 (0.014)	0.045 (0.047)	0.105 (0.044)	-0.039 (0.019)	-0.023 (0.021)	-0.092 (0.052)
<i># of adults</i>	-0.003 (0.023)	0.002 (0.021)	0.027 (0.032)	0.036 (0.035)	0.041 (0.016)	-0.037 (0.016)	0.033 (0.020)	0.018 (0.011)	0.028 (0.032)	0.000 (0.033)	-0.006 (0.011)	-0.066 (0.022)	0.059 (0.034)
<i># of children</i>	0.013 (0.021)	0.038 (0.017)	0.012 (0.030)	-0.015 (0.029)	0.007 (0.017)	-0.019 (0.011)	0.057 (0.019)	0.023 (0.011)	0.020 (0.028)	-0.010 (0.033)	-0.002 (0.011)	-0.070 (0.018)	-0.014 (0.036)
<i>Inheritance received</i>	0.053 (0.021)	-0.079 (0.020)	0.030 (0.042)	0.031 (0.030)	-0.043 (0.024)	-0.007 (0.012)	-0.124 (0.045)	-	-0.049 (0.047)	0.009 (0.051)	-0.019 (0.015)	0.006 (0.018)	0.029 (0.045)
<i>Savings account</i>	0.091 (0.048)	0.008 (0.028)	0.019 (0.039)	0.012 (0.038)	-0.019 (0.021)	0.083 (0.022)	0.047 (0.048)	0.022 (0.012)	-0.083 (0.041)	-0.006 (0.058)	-0.032 (0.019)	-0.033 (0.022)	-0.108 (0.050)
<i>Self-employed</i>	0.073 (0.032)	0.016 (0.045)	0.094 (0.047)	0.056 (0.041)	0.010 (0.025)	-0.049 (0.020)	0.017 (0.023)	0.004 (0.019)	-0.099 (0.054)	-0.007 (0.096)	-0.034 (0.021)	0.002 (0.029)	-0.059 (0.054)
<i>Employment share</i>	0.001 (0.002)	0.002 (0.003)	0.004 (0.005)	0.006 (0.003)	0.004 (0.002)	0.007 (0.001)	0.001 (0.002)	0.002 (0.001)	-0.001 (0.005)	0.006 (0.004)	0.001 (0.001)	0.001 (0.001)	0.003 (0.004)
<i>% with more jobs</i>	0.001 (0.000)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	0.002 (0.001)	0.000 (0.000)	0.001 (0.000)	0.003 (0.003)
<i>Informal fin. assistance</i>	-0.047 (0.016)	0.011 (0.029)	-0.039 (0.040)	-0.047 (0.026)	-	-	-0.012 (0.020)	-	0.017 (0.044)	-0.128 (0.038)	-0.009 (0.016)	-0.009 (0.018)	-0.049 (0.046)
<i>Low income expectations</i>	0.034 (0.019)	0.026 (0.021)	0.016 (0.034)	0.050 (0.021)	-0.042 (0.024)	-	0.011 (0.020)	0.029 (0.013)	0.011 (0.034)	-0.007 (0.046)	0.008 (0.013)	-0.017 (0.015)	0.124 (0.039)
<i>Transitory shock</i>	0.071 (0.028)	0.088 (0.026)	-0.022 (0.040)	0.001 (0.029)	0.014 (0.020)	-	0.010 (0.022)	0.025 (0.013)	-0.013 (0.045)	0.026 (0.070)	0.045 (0.015)	0.014 (0.018)	-0.026 (0.037)
<i>Low asset constraint</i>	0.125 (0.032)	-0.003 (0.046)	0.122 (0.110)	0.206 (0.040)	0.074 (0.037)	0.113 (0.026)	0.184 (0.044)	0.107 (0.036)	-0.018 (0.079)	0.089 (0.054)	0.147 (0.029)	0.082 (0.040)	-0.009 (0.110)
<i>Financial assets, ihs-transformed</i>	-0.022 (0.006)	-0.025 (0.006)	-0.013 (0.010)	-0.015 (0.009)	-0.012 (0.003)	-0.040 (0.004)	-0.030 (0.005)	-0.008 (0.002)	-0.016 (0.012)	-0.029 (0.010)	-0.002 (0.005)	-0.023 (0.004)	-0.035 (0.006)
<i>Real assets, ihs-transformed</i>	-0.002 (0.006)	-0.011 (0.007)	-0.010 (0.015)	0.002 (0.007)	0.007 (0.007)	0.011 (0.004)	0.025 (0.011)	0.013 (0.004)	-0.009 (0.014)	-0.010 (0.010)	0.006 (0.005)	-0.012 (0.007)	0.041 (0.019)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,914	14,958	2,056	7,113	888	1,206	3,687	1,772	301
<i>Pseudo-R<sup>2</sup></i>	0.164	0.167	0.137	0.141	0.110	0.134	0.160	0.107	0.110	0.125	0.147	0.149	0.204

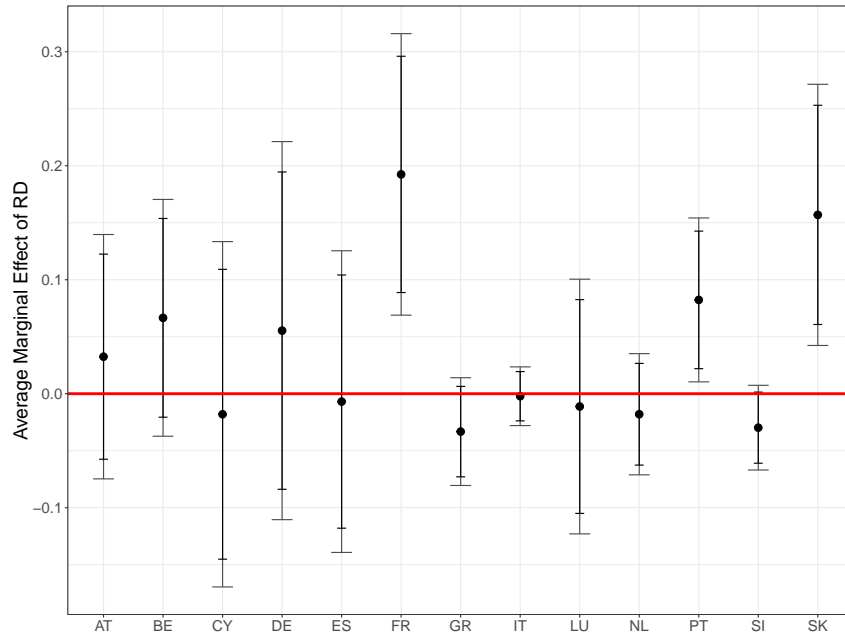
Note: Results are reported as average marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary education of household head.

Source: HFCS (2010).

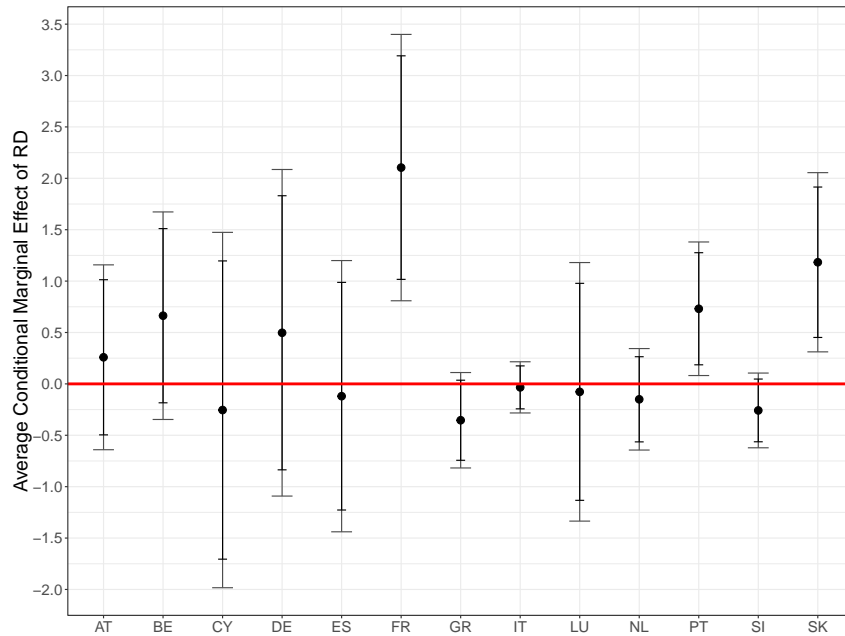
We then turn to the results of the variable of main interest – the *relative deprivation* – that measures income inequality at the household level. Figure 1a illustrates the average marginal effects of relative deprivation on the probability of holding consumer debts with the corresponding 95% and 90% confidence intervals. Again, the results show a heterogeneous pattern. In most countries the average marginal effects are not statistically different from zero. Interestingly, we observe in many countries, even though statistically insignificant, negative point estimates. Especially, the results for Greece and Slovenia (nearly significant at a 10% confidence interval) suggest a negative influence of income inequality on the probability of holding consumer debts. In contrast, households seem to react positively to income inequality in France, Portugal and Slovakia. Holding the own absolute household income and other household characteristics constant, a higher income inequality induces households to take on consumer debts. In particular, income inequality shows a strong impact in France. However, as reported in Table 2, in France we cannot use information about informal financial assistance from family and relatives, income expectations, and transitory income shocks. Leaving these important explanatory variables unconsidered in the regression, the estimates for relative deprivation in France are likely to be biased upward.

Second, we examine the impact of income inequality on the households' outstanding amount of consumer debts. As already discussed in Section 3, Table 1 reports low levels of indebted households in all countries considered in this study. In order to test the impact of income inequality appropriately, we need to take the large number of non-indebted households into account. We therefore apply a Tobit regression model. Table 6 in the Appendix reports the effects on the (conditional) expected values for indebted households. In principle, the estimated coefficients are consistent with those reported in Table 2. Analogous to the marginal effects, Figure 1b illustrates the (conditional) impact of RD on the outstanding amount. We observe a similar pattern in the effects as before. The effects are positive and statistically different from zero in France, Portugal and Slovakia. Even though the impact of relative deprivation is statistically insignificant in most countries, there seems to be at least weak evidence for a “keeping-up” behaviour of households.

**Figure 1** – (a) Average Marginal Effect of Income Inequality on Credit Market Participation. (b) Conditional Average Marginal Effect of Income Inequality on Debt Outstandings (ihs-transformed).



(a)



(b)

*Notes:* The whiskers indicate the corresponding 95% and the 90% confidence interval.  
*Source:* Own illustration.

So far, we have analysed average effects over the total sample. In this respect, RD reveals the average (conditional) impact of income inequality across the entire income distribution. In order to shed light on heterogeneous effects across the income distribution, we assess the average (conditional) effects for quartiles of the equalised income distribution. The results of the different (conditional) marginal effects are reported in Table 3.

**Table 3** – Average Marginal Effect of RD across the Income Distribution

<i>Dependent variable:</i>	$\text{Pr}(\text{debt} > 0)$												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>First quartile</i>	0.031 (0.048)	0.064 (0.048)	-0.014 (0.053)	0.056 (0.075)	-0.005 (0.047)	0.180 (0.058)	-0.023 (0.016)	-0.002 (0.013)	-0.011 (0.054)	-0.019 (0.028)	0.055 (0.022)	0.123 (0.044)	-0.026 (0.017)
<i>Second quartile</i>	0.032 (0.056)	0.065 (0.054)	-0.018 (0.076)	0.055 (0.086)	-0.007 (0.070)	0.196 (0.065)	-0.030 (0.022)	-0.002 (0.012)	-0.011 (0.057)	-0.019 (0.028)	0.082 (0.039)	0.158 (0.065)	-0.027 (0.017)
<i>Third quartile</i>	0.034 (0.060)	0.071 (0.059)	-0.020 (0.087)	0.057 (0.091)	-0.008 (0.077)	0.205 (0.068)	-0.035 (0.026)	-0.002 (0.013)	-0.012 (0.059)	-0.017 (0.027)	0.092 (0.043)	0.182 (0.071)	-0.031 (0.020)
<i>Fourth quartile</i>	0.032 (0.054)	0.066 (0.052)	-0.020 (0.088)	0.054 (0.083)	-0.008 (0.075)	0.188 (0.062)	-0.041 (0.030)	-0.002 (0.014)	-0.011 (0.058)	-0.017 (0.026)	0.094 (0.042)	0.159 (0.057)	-0.034 (0.022)

<i>Dependent variable:</i>	$\text{E}(\text{rhs}(\text{debt}) \mid \text{debt} > 0)$												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>First quartile</i>	0.255 (0.411)	0.688 (0.504)	-0.168 (0.513)	0.536 (0.728)	-0.085 (0.426)	1.908 (0.585)	-0.222 (0.141)	-0.035 (0.129)	-0.079 (0.645)	-0.157 (0.253)	0.453 (0.175)	0.887 (0.334)	-0.206 (0.153)
<i>Second quartile</i>	0.258 (0.472)	0.655 (0.540)	-0.239 (0.834)	0.501 (0.849)	-0.123 (0.714)	2.226 (0.712)	-0.308 (0.208)	-0.031 (0.115)	-0.076 (0.636)	-0.162 (0.274)	0.733 (0.356)	1.271 (0.534)	-0.228 (0.157)
<i>Third quartile</i>	0.270 (0.511)	0.702 (0.584)	-0.289 (1.044)	0.525 (0.926)	-0.135 (0.796)	2.299 (0.734)	-0.382 (0.260)	-0.034 (0.129)	-0.079 (0.660)	-0.141 (0.255)	0.821 (0.398)	1.365 (0.546)	-0.265 (0.198)
<i>Fourth quartile</i>	0.252 (0.443)	0.616 (0.470)	-0.299 (1.053)	0.445 (0.730)	-0.132 (0.752)	1.983 (0.618)	-0.447 (0.307)	-0.036 (0.135)	-0.075 (0.641)	-0.140 (0.234)	0.864 (0.387)	1.171 (0.418)	-0.325 (0.246)

*Note:* Results are reported as average marginal effects (Probit) in the first section and as average conditional marginal effects (Tobit) in the second section. Standard errors in parentheses. Standard errors computed based on replicate weights. Basegroup: lower secondary educ.

*Source:* HFCS (2010).

Overall, the results are in line with those presented in Table 2 and Table 6. Again, we find effects of income inequality that are statistically different from zero in FR, PT and SK. Interestingly, the point estimates are quite robust across the four income quartiles in all countries. We can however find a slight concave trend in the (conditional) effects. In most countries, the largest effect prevails in the third quartile and thus upper middle class. In contrast, CY, ES, GR, PT and SI show the largest effects in the highest income group. This pattern in the effects is consistent in the Probit and Tobit regression models.

The results suggest that the “keeping-up” behaviour of households prevails across the entire income distribution in FR, PT and SK. Among this group of countries, Portugal seems to be an interesting exception. This country is characterised by a relatively sharp increase in the marginal effects across the income quartiles. While the effect is the lowest in the first quartile, the effect nearly doubles up to the highest quartile. A further interesting finding applies to the countries with negative point estimates. There, we observe consistent patterns of negative statistically insignificant point estimates across the income quartiles. A supply-side income inequality mechanism stems from the notion that income works more as a signal for credit worthiness in the case of high income inequality. This would imply a varying impact of income inequality: a negative impact for lower income groups whereas a positive impact for higher income groups. Our findings in Table 3 however do not suggest such a supply-side mechanism.



### 5.1.1 Instrumental Variable Regressions

In the results presented above, we do not consider potential issues resulting from omitted variables, that affect both the borrowing behaviour and income inequality. Such an omitted variable is expected to result in a spurious relationship between the two variable of main interest. In order to test for a bias in our estimates and therefore lack in our identification strategy, we apply additionally an instrumental variable estimation.

Finding effective instruments to apply this approach is a difficult task. In order to transform our potentially *endogenous* income inequality variable into an exogenous variable, instruments have to fulfil the requirements of *exogeneity* and *relevance* (see Angrist and Pischke, 2008). Georgarakos, Haliassos, and Pasini (2014) rely on information about employment shares in regional high-tech industries (manufacturing and knowledge-intensive services) and gaps in educational attainments between households and their peer group. They argue that the educational gap raises households' perception of lagging behind and this effect is higher in regions with larger employment shares in high-tech industries. Thus, higher earnings of highly educated workers in high-tech industries may induce less educated workers in other industries to feel lagging behind. Since we do not have information about regions within countries, we cannot exploit variations in local employment rates. Instead, we use information on the overall employment in high-tech industries<sup>14</sup> within each country. Additionally, we compute the employment shares separately for age cohorts<sup>15</sup> (based on the age of the household head). In order to consider varying effects across educational groups, we compute the gap in educational attainments for households (i.e. the gap between highest educational attainment and highest educational attainment within the household). The interaction of both variables, employment rates in high-tech industries by age cohorts and educational attainment gaps, allows us to capture the variation of high earners by different ages for different educational attainment levels. Since we conduct our empirical analysis in multiple countries, we also consider an alternative set of instruments. In doing so, we select the size of the household main residence and income that accrues from private business (other than self-employment). Concerning this set of instruments, we assume that these variables are associated with a lower relative deprivation for households, while there is no direct impact on taking on consumer debts.

By discussing the assumptions of our instruments, we have to address the requirements of *relevance* and *exogeneity*. The correlation between the instruments and the potentially *endogenous* income inequality measure determines the instruments' relevance. In Table 7 we find the results of the first stage of our instrumental variable estimations. For AT, BE, DE and ES the instruments size of household main residence and income from private business seem to be more appropriate, while in all other countries we stick to the instruments that we derived from Georgarakos, Haliassos, and Pasini (2014)<sup>16</sup>. In the first stage results, we observe the correlation between instruments as well as our other explanatory variables and our income inequality measure *relative deprivation*. The first five variables reveal the results of our respective sets of instrument variables. The results of the household main residence and the income from private business show the expected negative sign. As indicated by the F-statistics for the instruments (see last row), the instruments show a high correlation in DE and ES, whereas a somewhat smaller role in AT and BE. With respect to

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<sup>14</sup>We compute the shares of employed individuals in percentage of the total population. Workers in *high-tech industries* are defined as managers and professionals in the industries *Manufacturing, Information & Communication*, and *Financial and Insurance Activities*.

<sup>15</sup>Age cohorts: under 35, 35-50 and over 50 years.

<sup>16</sup>In Italy, we only use information on the educational attainment gap due to data limitations

the other countries, the employment rates correlate positively with relative deprivation (with the exception of CY) as well as the educational attainment gap. In particular, the latter variable shows a strong correlation with our income inequality measure. The variable is statistically different from zero in almost all countries. In contrast, the point estimates for the interaction term between the employment rates and the educational attainment gap are negative, however in most countries not statistically significant. Interestingly, the estimates for the interaction term are statistically different from zero in FR and PT. These surprising results suggest that high-tech industry employment rates among individuals with the same age have a higher impact on relative deprivation for higher educated individuals. One potential explanation might be that highly educated individuals care relatively more about individuals/workers with higher incomes. Higher earnings of highly educated workers have therefore a higher impact on the income inequality of higher educated individuals. The F-statistics of the instruments point to a high correlation in FR, IT and PT. In contrast, the correlation is weaker in CY, LU, NL, SK and SI. Thus, the relevance of our sets of instruments is quite different across our sample of countries.

In addition, we assume that the instruments are exogenous. Following from this, the instruments do not have a direct effect on the probability of taking on consumer debts and the outstanding amount of consumer debts. There is only an indirect link from the instruments to the borrowing behaviour through income inequality. Given that we apply a rich set of additional control variables in our estimations – for example, temporary income shocks, income expectations, employment rates within the household – we assume that our instruments do not have a direct impact on indebtedness.

In Table 8 and Table 9 we present the results of our instrumental variable Probit and Tobit model. The first row shows the results of our income inequality measure – relative deprivation. Since we additionally control for the residuals from the first stage regression (see Table 7) in the second row, relative deprivation is expected to show unbiased estimates<sup>17</sup> In general, the results for our income inequality measure are similar to those of the baseline estimations in Table 2 and Table 6. The estimated coefficients point into the same direction, with the exceptions of ES, LU and NL. In the latter two countries, this change in the coefficients might be related to the weakness of the applied instruments. In contrast, instruments are not interpreted as weak in ES (see Table 7). By using instrument variable regressions, the estimates in ES turn from insignificantly negative to significantly positive. Overall, relative deprivation is statistically different from zero in more countries as compared to the baseline results.

We test for exogeneity of the relative deprivation variable by using a Wald-test. At the bottom of Table 8 and Table 9, we find the Wald-test statistics. In all countries, we fail to reject the null hypothesis of exogeneity (critical value of  $\chi^2$  at 90% significance level is 2.706)<sup>18</sup> The results suggest a preference for the results from the baseline specifications in Table 2 and Table 6.

<sup>17</sup>Estimates of this (two-stage OLS) regression are identical to the *2SLS* estimates, while standard errors are typically different. By using the HFCS data, we, however, derive inference based on estimated coefficients that we obtained from regressions using different replicate weights (see Finance and Network, 2013). Accordingly, standard errors are not biased.

<sup>18</sup>We also conducted a *Hausman test* that is robust to heteroscedasticity. The test is based on the difference of two *Sargan-Hansen* statistics, one for the specification, where relative deprivation is treated as endogenous, and the other for the specification augmented by the instrument where relative deprivation is treated as exogenous. The results for this endogeneity test are in line with those presented in Table 8 and Table 9.

## 5.2 Multilevel Regressions

In addition to individual household characteristics, country-specific characteristics may also have an effect on the opportunity and/or necessity for households to take on debts. The size of the credit market as well as the stage of its liberalisation are crucial determinants for the credit-supply channel (see Bazillier and Hericourt, 2017). The development in the housing markets may also be relevant since there is a direct link to mortgages and more generally to households' risk-behaviour<sup>19</sup>. In order to control for credit costs, we consider the real long-term interest rates in countries. Wildauer and Stockhammer (2018) discuss the credit market deregulation, the housing boom and a low interest rate as crucial determinants for household debts. In addition, the welfare state reflects a sort of security system for individuals and households<sup>20</sup>, which may also affect households' indebtedness.

In order to consider additional country-specific variables in our regression specification, we estimate multilevel Probit and Tobit models, as illustrated in Specification 3, where the dependent variable is again a dummy variable indicating whether a household holds consumer debts or not, and the outstanding amount, respectively. The average (conditional) marginal effects are reported in Table 10 in Columns (1) and (2) respectively, in the Appendix. The results are structured in two sections. The first section shows the results for covariates at the household level while the second section lists the results for covariates at the country level.

The results of the two specifications are robust. The estimated coefficients point in the same direction in both columns. The own absolute household income reveals a positive effect on households' indebtedness that is only weakly statistically different from zero. The age of the household head seems to be negatively associated with indebtedness. The older the household head, on average, the lower the likelihood of holding consumer debts as well as the lower the amount of outstanding debt. Households with a female household head are less prone to indebtedness compared to households with a male household head. Then, interestingly, education seems to matter for indebtedness only when the household head has the highest educational attainment. Moreover, the number of adults within a household also influences households' indebtedness. The results for the employment share within the household suggest that the indebtedness of households is more likely, on average, when the employment among household members is higher. The availability of financial assistance via relatives and/or friends constitutes a crucial determinant for indebtedness that is indicated as an important coping mechanisms, as discussed above. In addition, we find that (expected) transitory income instability, as captured by "low income expectations" and "transitory shock", is positively associated with households' indebtedness. These results suggest that households take out debts in order to smooth consumption. Again, households that are constrained by a low level of assets exhibit, on average, a higher likelihood of holding consumer debts as well as higher expected values of consumer debts. Additionally, as concerns households' assets, financial assets are associated negatively with households' indebtedness. In contrast, real assets show a positive impact on indebtedness. This effect is, however, only weakly statistically different from zero.

Then, we turn to the results of our country-specific variables. Since we only cover a small number of countries in our analysis, we need to be cautious in the interpretation of the results of our country-

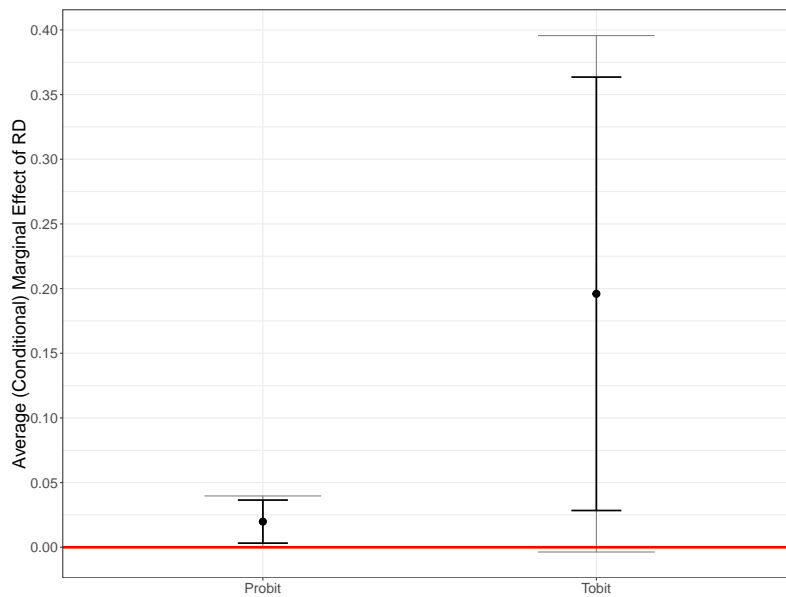
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<sup>19</sup>The results of Mian, Rao, and Sufi (2013) suggests a direct link between house prices and household consumption as well as indebtedness, by using household data for the US. Moreover, Burrows (2018) uses household-level data for the UK and provides evidence for the nexus between house prices and borrowings.

<sup>20</sup>Fessler and Schürz (2018) show that welfare state expenditures are substitutes for the accumulation of private wealth. In the case of a more pronounced welfare state, households save less for precautionary issues.

specific variables. According to Bryan and Jenkins (2015) and Stegmueller (2013), multilevel estimates for higher-level covariates do have biased standard errors when there is only a small number of observations at the highest hierarchical level. The estimates at the household level, however, remain unaffected, given that we estimate a random-intercept model. Accordingly, we need to be cautious when interpreting the results of our country-specific variables in the following. We consider domestic credit to the private sector in % of GDP in our specification to control for the size of the credit market. Although we find a positive point estimate for the size of the credit market, it does not seem to play a statistically significant role for household indebtedness. Similarly, the index of residential property does not show a statistically significant impact on household indebtedness. In contrast, the public social expenditures in % of GDP show a relatively strong positive impact on households' indebtedness which is statistically significant. When a country provides a stronger welfare state and social security system, households show a higher probability of being indebted as well as a higher expected value of the outstanding amount. In the case of a strong welfare state, households do not seem to see the need to save for precautionary issues (see Fessler and Schürz, 2018); they even prefer to take on consumer debts. The real long-term interest rate shows a negative statistically significant impact on household indebtedness. A higher interest rate makes borrowing more costly which affects credit demand negatively. Having discussed household and country-level characteristics, we take a look at our variable of main interest. In Figure 2 we observe the results for the relative deprivation of households.

**Figure 2** – Average (Conditional) Marginal Effect of Income Inequality



*Notes:* The whiskers indicate the corresponding 95% and the 90% confidence interval.  
*Source:* Own illustration.

We find positive weakly statistically significant average (conditional) marginal effects in both specifications. Holding other factors fixed, the higher the exposure to income inequality for a household, the higher, on average, the impact on the indebtedness. The country-specific regressions in Section 5.1 show a positive statistically significant impact of income inequality in a small set of countries. Interestingly, the results of our multilevel specifications point to an overall positive impact across all countries considered in the analysis. Given that we additionally control for

country-specific determinants, households that have a higher exposure to income inequality show, on average, a higher likelihood of being indebted and hold higher outstanding amounts of consumer debts. These results thus point to a, at least weak, “keeping-up” behaviour of households in euro area countries.

## 6 Robustness Checks

In order to assess the robustness of our findings, we conduct further checks. First, we want to test the robustness of our measure for income inequality. Second, we consider the total consumer debts stock so far. However, we are interested in the question of what is the impact of income inequality on current/new debts as well. In doing so, we use the following question in the survey: “*In the last three years, have you (or any member of your household) applied for a loan or other credit?*”.

Georgarakos, Haliassos, and Pasini (2014) apply *inter alia* the difference between the own income and the average peer income as their relative income measure. Thus, they implicitly assume that households compare themselves with the average household within their reference group. By using the *relative deprivation* measure in our analysis, we assume that households make comparison particularly with higher-income households. In order to consider that households compare themselves with the average, we compute the *relative income* (RI) for an individual  $i$  as the ratio between the own (equivalised) income ( $y_i$ ) and the average (equivalised) income ( $\bar{y}$ ) in a country:

$$RI_i = \frac{y_i}{\bar{y}}, \quad (4)$$

where  $\bar{y} = \frac{\sum_{j=1}^N y_j}{N}$  and  $N$  is the total number of households in a country. Thus, the higher  $RI_i$ , the larger the distance to the average household and the higher is its position across the social ladder. Conversely, when  $RI_i$  is smaller than one, a household is lagging behind the average household. By using  $RI$  instead of  $RD$ , we rerun the baseline specifications from Table 2 and Table 6. The estimation results are presented in Table 11 and Table 12 in the Appendix. The results are similar to those of the initial income inequality measure ( $RD$ ). We find positive point estimates in CY, GR, IT, NL and SI. This would suggest that the higher the household’s own income relative to the average income, the higher the impact on debts, holding other factors constant. However, none of the estimated coefficients is statistically different from zero. In contrast, we observe negative point estimates in the majority of countries. This implies that, on average, lagging behind induces households to take out consumer debts. Again, this effect is statistically significant in France, Portugal and Slovakia. Thus, the results for  $RI$  coincide with those for  $RD$ .

We then turn to the question as to whether a household has applied for a new credit. Since that variable represents a dummy variable, we can only employ a Probit regression model. In doing so, we apply the baseline specification (as shown in Table 2). The results are presented in Table 13 in the Appendix. Interestingly, we find positive marginal average effects in nearly all countries. Cyprus and Spain are exceptions where we observe negative results. However, the average marginal effects are only statistically different from zero in France and Greece. Surprisingly, Greece shows here a positive effect of income inequality on the likelihood to apply for a new credit. Income inequality however does not reveal a statistically significant impact in Portugal and Slovakia. Those results are different to the findings obtained in our specifications before. This might be related to the time of fieldwork of the HFCS survey. Information on wealth and liabilities in Portugal and Slovakia were collected in 2010. Thus, the last three years cover the crisis period from 2007 onwards. In contrast, fieldwork concerning those items in France and Greece took place in 2009. The three years therefore also cover a short period before the crisis. Since it is assumed that the crisis affected the risk-taking behaviour of households substantially, households’ financial

behaviour may differ in the two periods.

## 7 Conclusion

There is only scarce empirical evidence on the impact of income inequality on the financial behaviour of households in continental European countries. Most of the analyses rely on data for individual countries and focus on total household debt. In this paper, we investigate the impact of the exposure to income inequality on consumption-related household indebtedness and shed light on the heterogeneity in effects across continental European countries. In doing so, we make use of the Eurosystem Household Finance and Consumption Survey for the year 2010. Based on the purpose of debts, we focus on debt positions in the households' balance sheet that are potentially used for "conspicuous" consumption. A rich set of explanatory variables enables us to control for transitory income shocks, employment intensity within households, wealth stocks and informal channels to acquire financial resources. Additionally, we consider country-specific characteristics by using a multilevel regression model. This allows us to control further for the size and liberalisation of the credit market, strength of the welfare state, general price level in the residential market and the long-term real interest rate.

The country-specific regressions reveal a heterogeneous pattern for the impact of income inequality on consumer debts. We find a robust positive impact of income inequality in France, Portugal and Slovakia. In the countries Austria, Belgium, Cyprus, Germany, Spain, Greece, Italy, Luxembourg, the Netherlands and Slovenia, income inequality does not seem to be influential for holding consumer debts. Interestingly, even though the country-specific regressions show an impact of income inequality in a set of countries only, the results of our multilevel regression models point to an overall positive impact across all the countries considered in the analysis. Given that we control additionally for country-specific covariates, households are, on average, more induced to hold consumer debts, when they are lagging behind.

Overall, our results suggest that there is, to some extent, a link between income inequality and consumption-related household indebtedness in continental European countries. Individuals do not only consider their own balance sheet when they make financial decisions, but also take their relative position in the society into account. Further research needs to address whether this mechanism is also related to over-indebtedness of households. The low levels of consumer debts in euro area countries, however, point to a low risk of financial stress and macroeconomic instability.



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## Appendix – Data

**Table 4** – Description of Explanatory Variables

<b>Variable</b>	<b>Description</b>
<i>RD</i>	relative deprivation - income inequality measure
<i>Gross inc.</i>	gross household income
<i>Age HHH</i>	age of household head
<i>Female HHH</i>	female household head
<i>Educ 1 HHH</i>	primary education or below of household head
<i>Educ 3 HHH</i>	upper secondary education of household head
<i>Educ 4 HHH</i>	tertiary education of household head
<i>Age diff.</i>	age difference within the household (max-min)
<i>Educ diff.</i>	education difference within the household (max-min)
<i>Married HHH</i>	married household head
<i># of adults</i>	number of adults in the household
<i># of children</i>	number of children in the household
<i>Inherit. received</i>	household received an inheritance
<i>Savings account</i>	household holds a saving account
<i>Self-employed</i>	household holds self-employment assets
<i>Employ. share</i>	share of employed individuals within the household (older than 16 years)
<i>% with more jobs</i>	share of individuals with more than one job among employed individuals within the household
<i>Informal fin. assist.</i>	ability to get financial assistance from friends or relatives
<i>Low inc. expec.</i>	low future income expectations
<i>Transitory shock</i>	income is considered as low in reference period compared to other periods
<i>Low assets constraint</i>	household's net assets are worth less than six months' gross household income
<i>Fin. assets</i>	household's financial assets
<i>Real assets</i>	household's real assets

*Note:* HHH – household head; own illustration.

*Source:* HFCS (2010).

**Table 5 – Correlation Matrix**

	<i>RD</i>	<i>Gross inc.</i>	<i>AgeHHH</i>	<i>FemaleHHH</i>	<i>Educ1HHH</i>	<i>Educ3HHH</i>	<i>Educ4HHH</i>	<i>Age diff.</i>	<i>Educ diff.</i>	<i>MarriedHHH</i>	<i># of adults</i>	<i># of children</i>	<i>Inherit. rec.</i>	<i>Sav. account</i>	<i>Self-employ.</i>	<i>Employ.share</i>	<i>% more jobs</i>	<i>Inf.fin.assist.</i>	<i>Low inc.expec.</i>	<i>Trans.shock</i>	<i>Low assets c.</i>	<i>Fin.assets</i>	<i>Real assets</i>
<i>RD</i>	1																						
<i>Gross inc.</i>	-0.3358	1																					
<i>Age HHH</i>	0.0421	-0.0413	1																				
<i>Female HHH</i>	0.0527	-0.1051	-0.0225	1																			
<i>Educ1 HHH</i>	0.1604	-0.2396	0.3479	0.0216	1																		
<i>Educ3 HHH</i>	-0.0095	0.0044	-0.224	-0.0095	-0.39	1																	
<i>Educ4 HHH</i>	-0.1857	0.2593	-0.1046	-0.0262	-0.3051	-0.4506	1																
<i>Age diff.</i>	-0.0309	0.1888	-0.3178	-0.0332	-0.0798	0.0262	0.0462	1															
<i>Educ diff.</i>	-0.0444	0.1974	-0.0548	-0.0805	-0.0723	-0.0709	0.1501	0.3976	1														
<i>Married HHH</i>	-0.1258	0.2303	0.0935	-0.2603	-0.0458	-0.021	0.0678	0.2519	0.2449	1													
<i># of adults</i>	-0.0978	0.2539	-0.1203	-0.1447	-0.0423	0.005	0.0049	0.6568	0.5165	0.4768	1												
<i># of children</i>	0.0633	0.1091	-0.3992	-0.0103	-0.1219	0.0469	0.0862	0.5636	0.0521	0.1663	0.1029	1											
<i>Inherit. received</i>	0.0624	0.0884	0.1286	-0.0798	0.004	-0.0343	0.1249	-0.0347	0.0362	0.0793	0.0151	-0.0385	1										
<i>Savings account</i>	0.1313	0.111	0.0848	-0.0889	0.007	0.0209	0.0841	-0.0232	0.0296	0.0419	-0.011	-0.0035	0.3363	1									
<i>Self-employ.</i>	-0.1218	0.1509	-0.0805	-0.063	-0.1133	0.025	0.0818	0.1425	0.0988	0.1293	0.154	0.0901	0.0772	-0.0044	1								
<i>Employ. share</i>	-0.2428	0.3089	-0.5215	-0.0688	-0.2497	0.1161	0.1521	0.5335	0.2603	0.240	0.504	0.3717	-0.0288	-0.0046	0.2553	1							
<i>% more jobs</i>	-0.0548	0.0576	-0.0913	-0.0141	-0.0663	0.005	0.0712	0.0524	0.0306	0.0093	0.032	0.0444	0.0152	0.009	0.1106	0.1171	1						
<i>Inf. fin. assist.</i>	-0.1982	-0.0418	-0.0827	-0.0063	-0.0241	0.0262	0.0514	0.014	-0.0348	0.0326	0.0149	0.0121	0.0491	0.1231	-0.0338	0.0783	0.0326	1					
<i>Low inc. expec.</i>	-0.1607	-0.0854	0.0434	0.0224	0.0219	0.0356	-0.0757	0.0345	-0.0293	0.0437	0.0583	-0.0454	-0.0575	-0.023	-0.0507	-0.0007	-0.0066	0.2218	1				
<i>Trans. shock</i>	-0.0253	-0.1645	-0.0242	0.0372	0.0701	-0.019	-0.0756	0.0696	-0.0081	0.0079	0.0641	-0.0009	-0.0309	-0.1141	-0.0081	-0.0089	0.0019	0.0757	0.2173	1			
<i>Low assets c.</i>	0.1427	-0.1093	-0.1889	0.0787	0.0364	0.0449	-0.0955	-0.0903	-0.1227	-0.2231	-0.1742	0.0105	-0.159	-0.1318	-0.1342	-0.0812	-0.0098	-0.0371	-0.0154	0.0121	1		
<i>Fin. assets</i>	-0.2044	0.3689	0.1519	-0.1255	-0.196	-0.0313	0.2726	-0.0064	0.124	0.1927	0.1025	-0.0459	0.2532	0.3395	0.164	0.0967	0.0418	0.0558	-0.0691	-0.1408	-0.405	1	
<i>Real assets</i>	-0.2175	0.3019	0.1457	-0.1128	-0.1613	-0.0424	0.2099	0.1191	0.1676	0.2697	0.2135	0.0197	0.2034	0.0401	0.2599	0.1493	0.0582	0.0151	-0.0252	-0.0317	-0.5982	0.417	1

Source: HFCS (2010).

# Appendix – Regression Results

Table 6 – Tobit Regressions

<i>Dependent variable:</i>	E(ihs(debt)   debt > 0)												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Relative deprivation, ihs-transformed</i>	0.259 (0.459)	0.663 (0.515)	-0.254 (0.882)	0.497 (0.811)	-0.120 (0.673)	2.104 (0.661)	-0.354 (0.237)	-0.034 (0.127)	-0.077 (0.642)	-0.150 (0.252)	0.731 (0.332)	1.183 (0.445)	-0.258 (0.185)
<i>Gross income, ihs-transformed</i>	0.460 (0.507)	0.636 (0.427)	0.364 (1.055)	0.214 (0.767)	0.088 (0.289)	1.785 (0.473)	0.045 (0.227)	0.009 (0.127)	0.539 (0.477)	-0.114 (0.355)	1.006 (0.314)	2.017 (0.686)	0.053 (0.065)
<i>Age of household head</i>	-0.011 (0.006)	0.014 (0.010)	-0.058 (0.020)	-0.032 (0.011)	-0.028 (0.008)	-0.016 (0.005)	-0.015 (0.009)	-0.017 (0.005)	-0.048 (0.020)	-0.045 (0.019)	-0.025 (0.010)	-0.007 (0.005)	-0.049 (0.013)
<i>Female household head</i>	-0.037 (0.175)	0.162 (0.200)	-0.777 (0.440)	-0.396 (0.218)	0.062 (0.174)	-0.070 (0.115)	-0.133 (0.185)	-0.351 (0.085)	-0.419 (0.360)	-0.028 (0.369)	-0.243 (0.157)	-0.113 (0.118)	-0.730 (0.333)
<i>Primary educ or below</i>	2.461 (1.404)	-0.610 (0.536)	0.452 (1.168)	-0.490 (4.284)	-0.089 (0.231)	-0.358 (0.222)	-0.351 (0.332)	-0.052 (0.187)	-1.623 (0.657)	0.826 (1.018)	0.050 (0.183)	-5.770 (1.060)	-19.872 (1.331)
<i>Upper secondary educ</i>	0.547 (0.258)	0.135 (0.307)	0.780 (0.876)	0.218 (0.350)	0.040 (0.239)	0.199 (0.213)	0.242 (0.293)	-0.063 (0.118)	-1.044 (0.542)	0.078 (0.416)	0.232 (0.172)	1.070 (0.751)	-0.068 (0.515)
<i>Tertiary educ</i>	0.059 (0.367)	0.029 (0.318)	0.873 (0.866)	-0.275 (0.485)	0.145 (0.268)	-0.376 (0.222)	-0.270 (0.337)	-0.045 (0.204)	-2.086 (0.689)	-0.388 (0.483)	0.135 (0.225)	0.728 (0.775)	-0.128 (0.636)
<i>Age diff. within HH</i>	-0.001 (0.008)	0.000 (0.010)	-0.010 (0.023)	0.005 (0.014)	0.002 (0.007)	-0.002 (0.005)	-0.013 (0.011)	0.005 (0.006)	-0.024 (0.019)	0.021 (0.019)	0.010 (0.005)	0.012 (0.007)	0.001 (0.018)
<i>Educ diff. within HH</i>	0.056 (0.127)	0.211 (0.116)	-	-0.079 (-)	0.103 (0.107)	0.120 (0.068)	0.158 (0.059)	0.021 (0.105)	0.290 (0.062)	-0.102 (0.184)	-0.060 (0.166)	0.087 (0.058)	-0.160 (0.091)
<i>Married household head</i>	-0.421 (0.214)	-0.159 (0.230)	-0.099 (0.575)	-0.221 (0.308)	0.111 (0.221)	0.174 (0.133)	-0.107 (0.230)	-0.011 (0.134)	0.486 (0.505)	0.977 (0.401)	-0.348 (0.175)	-0.143 (0.153)	-0.730 (0.463)
<i># of adults</i>	-0.043 (0.195)	-0.031 (0.194)	0.247 (0.332)	0.284 (0.321)	0.409 (0.153)	-0.369 (0.151)	0.358 (0.204)	0.164 (0.096)	0.236 (0.335)	-0.052 (0.310)	-0.061 (0.100)	-0.513 (0.171)	0.556 (0.288)
<i># of children</i>	0.085 (0.168)	0.331 (0.157)	0.094 (0.329)	-0.157 (0.267)	0.041 (0.164)	-0.215 (0.108)	0.554 (0.181)	0.194 (0.100)	0.187 (0.275)	-0.144 (0.300)	-0.032 (0.100)	-0.537 (0.139)	-0.151 (0.330)
<i>Inheritance received</i>	0.499 (0.189)	-0.799 (0.196)	0.302 (0.460)	0.286 (0.292)	-0.439 (0.246)	-0.098 (0.119)	-1.234 (0.471)	-	-0.609 (0.509)	0.063 (0.491)	-0.189 (0.135)	0.023 (0.138)	0.292 (0.403)
<i>Savings account</i>	0.727 (0.427)	0.075 (0.270)	0.147 (0.420)	0.039 (0.351)	-0.211 (0.210)	0.766 (0.212)	0.414 (0.481)	0.203 (0.114)	-0.841 (0.407)	-0.150 (0.549)	-0.303 (0.170)	-0.261 (0.165)	-1.037 (0.476)
<i>Self-employed</i>	0.660 (0.290)	0.165 (0.440)	0.976 (0.504)	0.534 (0.400)	0.112 (0.253)	-0.480 (0.193)	0.154 (0.223)	0.052 (0.180)	-1.044 (0.603)	-0.074 (0.894)	-0.310 (0.191)	0.020 (0.219)	-0.541 (0.504)
<i>Employment share</i>	0.010 (0.019)	0.022 (0.024)	0.039 (0.052)	0.060 (0.031)	0.042 (0.018)	0.068 (0.013)	0.010 (0.023)	0.021 (0.014)	0.000 (0.047)	0.059 (0.042)	0.011 (0.014)	0.005 (0.016)	0.027 (0.037)
<i>% with more jobs</i>	0.010 (0.003)	0.003 (0.006)	0.001 (0.011)	-0.001 (0.005)	-0.006 (0.007)	0.008 (0.005)	0.009 (0.005)	-0.004 (0.013)	0.008 (0.013)	0.019 (0.007)	0.003 (0.004)	0.010 (0.003)	0.018 (0.023)
<i>Informal fin. assistance</i>	-0.400 (0.143)	0.061 (0.274)	-0.478 (0.433)	-0.411 (0.239)	-	-	-0.119 (0.198)	-	0.159 (0.464)	-1.141 (0.346)	-0.093 (0.139)	-0.078 (0.134)	-0.399 (0.420)
<i>Low income expectations</i>	0.290 (0.172)	0.213 (0.208)	0.172 (0.370)	0.453 (0.200)	-0.417 (0.244)	-	0.132 (0.206)	0.290 (0.127)	0.129 (0.364)	-0.064 (0.421)	0.052 (0.119)	-0.125 (0.115)	1.241 (0.386)
<i>Transitory shock</i>	0.613 (0.235)	0.806 (0.245)	-0.132 (0.417)	0.047 (0.270)	0.111 (0.207)	-	0.093 (0.219)	0.234 (0.123)	-0.088 (0.479)	0.155 (0.616)	0.395 (0.134)	0.117 (0.135)	-0.201 (0.335)
<i>Low asset constraint</i>	1.117 (0.283)	-0.016 (0.410)	1.387 (1.018)	1.963 (0.350)	0.722 (0.344)	1.175 (0.241)	1.682 (0.388)	1.000 (0.333)	-0.040 (0.793)	0.966 (0.491)	1.279 (0.241)	0.612 (0.277)	0.298 (1.057)
<i>Financial assets, ihs-transformed</i>	-0.171 (0.054)	-0.210 (0.046)	-0.132 (0.098)	-0.121 (0.073)	-0.119 (0.032)	-0.340 (0.034)	-0.282 (0.048)	-0.072 (0.015)	-0.167 (0.127)	-0.229 (0.083)	-0.016 (0.042)	-0.160 (0.031)	-0.266 (0.054)
<i>Real assets, ihs-transformed</i>	-0.014 (0.049)	-0.093 (0.071)	-0.082 (0.164)	0.025 (0.063)	0.078 (0.067)	0.119 (0.041)	0.242 (0.105)	0.123 (0.040)	-0.059 (0.147)	-0.081 (0.092)	0.056 (0.042)	-0.082 (0.053)	0.362 (0.183)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,916	14,958	2,056	7,113	888	1,206	3,687	1,777	315
<i>Pseudo-R<sup>2</sup></i>	0.031	0.027	0.027	0.030	0.019	0.025	0.029	0.015	0.021	0.029	0.021	0.022	0.041

*Note:* Results are reported as average conditional marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary educ. FI & MT excluded due to data availability limitations.

*Source:* HFCS (2010).

# Appendix – IV-Regression Results

Table 7 – Auxiliary Regression – 1<sup>st</sup> Stage Regression

<i>Dependent variable:</i>	<i>ihs(relative deprivation)</i>												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>HMR-size, ihs-transformed</i>	-0.049 (0.028)	-0.057 (0.040)	-	-0.141 (0.036)	-0.029 (0.010)	-	-	-	-	-	-	-	-
<i>Business income, ihs-transformed</i>	-0.021 (0.011)	-0.057 (0.030)	-	-0.018 (0.007)	-0.019 (0.005)	-	-	-	-	-	-	-	-
<i>High-inc employ. rates (by age cohorts)</i>	-	-	-0.014	-	-	0.014	1.098	-	0.010	0.042	0.104	0.015	0.251
<i>Educational gap</i>	-	-	0.035	-	-	0.032	0.086	0.128	0.064	0.115	0.161	0.017	0.143
<i>High-inc employ. rates × educational gap</i>	-	-	0.017	-	-	-0.007	-0.080	-	-0.006	-0.017	-0.030	0.005	0.001
<i>Gross income, ihs-transformed</i>	-0.617 (0.168)	-0.234 (0.038)	-0.298 (0.106)	-0.374 (0.092)	-0.160 (0.023)	-0.487 (0.029)	-0.301 (0.077)	-0.447 (0.060)	-0.250 (0.077)	-0.775 (0.187)	-0.275 (0.026)	-0.946 (0.204)	-0.137 (0.015)
<i>Age household head (HHH)</i>	0.003 (0.005)	-0.005 (0.005)	-0.033 (0.012)	-0.006 (0.004)	-0.008 (0.002)	0.003 (0.001)	-0.006 (0.005)	-0.011 (0.003)	-0.020 (0.005)	-0.035 (0.013)	-0.018 (0.004)	-0.009 (0.005)	0.008 (0.018)
<i>Age HHH × age HHH</i>	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Female household head</i>	0.031 (0.021)	0.019 (0.025)	0.028 (0.076)	0.053 (0.022)	0.019 (0.007)	-0.001 (0.003)	0.034 (0.024)	0.054 (0.015)	0.075 (0.029)	0.153 (0.066)	0.060 (0.021)	0.028 (0.023)	0.084 (0.064)
<i>Primary educ or below</i>	0.117 (0.110)	0.068 (0.054)	0.045 (0.114)	-0.063 (0.057)	0.037 (0.013)	0.004 (0.006)	0.030 (0.040)	0.006 (0.024)	0.132 (0.074)	-0.049 (0.107)	0.055 (0.027)	0.000 (0.175)	0.000 (0.135)
<i>Upper secondary educ</i>	-0.073 (0.043)	-0.023 (0.048)	0.043 (0.068)	-0.038 (0.039)	-0.029 (0.012)	0.009 (0.006)	-0.090 (0.045)	-0.048 (0.024)	0.098 (0.068)	-0.043 (0.073)	-0.067 (0.040)	-0.025 (0.051)	0.267 (0.078)
<i>Tertiary educ</i>	-0.214 (0.085)	-0.165 (0.053)	0.000 (0.000)	-0.149 (0.051)	-0.131 (0.016)	-0.019 (0.008)	-0.202 (0.067)	-0.219 (0.054)	-0.182 (0.078)	-0.047 (0.158)	-0.066 (0.057)	-0.066 (0.080)	0.205 (0.132)
<i>Age diff. within HH</i>	0.002 (0.001)	0.002 (0.001)	0.003 (0.003)	0.002 (0.001)	0.000 (0.000)	0.001 (0.000)	0.001 (0.002)	0.001 (0.001)	0.001 (0.002)	0.008 (0.003)	0.001 (0.001)	0.003 (0.001)	0.005 (0.004)
<i>Educ diff. within HH</i>	-0.018 (0.020)	0.006 (0.012)	-	0.020 (0.010)	0.009 (0.004)	0.015 (0.002)	0.045 (0.020)	0.064 (0.017)	0.045 (0.019)	0.052 (0.034)	0.092 (0.020)	0.015 (0.020)	0.020 (0.076)
<i>Married household head</i>	0.007 (0.050)	-0.009 (0.031)	-0.028 (0.072)	-0.002 (0.023)	0.019 (0.011)	0.016 (0.004)	-0.014 (0.033)	0.001 (0.023)	0.014 (0.034)	0.036 (0.090)	-0.011 (0.025)	0.037 (0.043)	0.027 (0.083)
<i># of adults</i>	0.243 (0.024)	0.132 (0.024)	0.164 (0.040)	0.176 (0.029)	0.075 (0.009)	0.135 (0.007)	0.199 (0.033)	0.234 (0.019)	0.163 (0.025)	0.329 (0.064)	0.146 (0.015)	0.239 (0.028)	0.124 (0.052)
<i># of children</i>	0.177 (0.024)	0.129 (0.024)	0.124 (0.036)	0.137 (0.017)	0.081 (0.008)	0.090 (0.003)	0.185 (0.032)	0.211 (0.020)	0.112 (0.023)	0.199 (0.049)	0.104 (0.014)	0.153 (0.036)	0.078 (0.067)
<i>Inheritance received</i>	-0.031 (0.022)	0.005 (0.027)	0.027 (0.054)	0.026 (0.018)	0.004 (0.009)	0.006 (0.005)	0.027 (0.065)	-	-0.035 (0.039)	-0.056 (0.104)	0.055 (0.022)	0.005 (0.019)	-0.022 (0.085)
<i>Savings account</i>	0.092 (0.053)	0.059 (0.043)	-0.021 (0.052)	-0.015 (0.029)	-0.011 (0.008)	0.030 (0.005)	-0.061 (0.052)	0.025 (0.017)	-0.011 (0.038)	0.057 (0.091)	0.028 (0.019)	0.012 (0.020)	0.094 (0.081)
<i>Self-employed</i>	-0.004 (0.058)	-0.137 (0.068)	-0.062 (0.083)	-0.092 (0.040)	-0.001 (0.013)	-0.056 (0.008)	-0.156 (0.060)	-0.180 (0.027)	-0.299 (0.120)	0.149 (0.128)	-0.003 (0.039)	-0.356 (0.117)	-0.100 (0.116)
<i>Employment share within HH</i>	-0.011 (0.006)	-0.016 (0.004)	-0.015 (0.006)	-0.008 (0.003)	-0.010 (0.001)	0.002 (0.001)	-0.036 (0.004)	-0.023 (0.003)	-0.019 (0.005)	-0.012 (0.008)	-0.015 (0.002)	-0.009 (0.008)	-0.061 (0.006)
<i>% with more jobs</i>	-0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001 (0.001)	-0.002 (0.001)	0.000 (0.002)	0.001 (0.002)	-0.001 (0.002)	0.001 (0.001)	-0.007 (0.003)
<i>Informal fin. assistance</i>	-0.022 (0.029)	-0.015 (0.030)	0.039 (0.065)	-0.015 (0.014)	-	-	-0.048 (0.031)	-	-0.028 (0.043)	-0.003 (0.060)	0.007 (0.018)	0.039 (0.021)	-0.159 (0.080)
<i>Low income expectations</i>	0.024 (0.025)	0.026 (0.024)	0.070 (0.059)	0.062 (0.025)	0.002 (0.010)	-	0.071 (0.032)	0.041 (0.014)	0.001 (0.033)	-0.004 (0.061)	-0.044 (0.016)	0.012 (0.021)	-0.243 (0.086)
<i>Transitory shock</i>	-0.023 (0.038)	0.029 (0.039)	0.120 (0.084)	-0.028 (0.025)	0.019 (0.007)	-	0.091 (0.022)	0.066 (0.028)	0.084 (0.050)	0.104 (0.121)	0.048 (0.020)	0.067 (0.025)	0.253 (0.058)
<i>Low asset constraint</i>	-0.129 (0.057)	-0.214 (0.096)	-0.263 (0.124)	-0.072 (0.031)	-0.126 (0.021)	-0.016 (0.008)	-0.453 (0.087)	-0.208 (0.040)	-0.180 (0.075)	-0.197 (0.084)	-0.254 (0.037)	0.002 (0.063)	-0.480 (0.189)
<i>Financial assets, ihs-transformed</i>	-0.040 (0.014)	-0.020 (0.007)	-0.025 (0.013)	-0.034 (0.009)	-0.012 (0.002)	-0.016 (0.003)	-0.030 (0.007)	-0.027 (0.003)	-0.046 (0.014)	-0.059 (0.016)	-0.065 (0.006)	-0.014 (0.011)	-0.034 (0.009)
<i>Real assets, ihs-transformed</i>	-0.029 (0.014)	-0.033 (0.010)	-0.065 (0.017)	-0.019 (0.006)	-0.028 (0.005)	-0.006 (0.002)	-0.099 (0.018)	-0.066 (0.007)	-0.055 (0.017)	-0.052 (0.016)	-0.050 (0.007)	0.018 (0.014)	-0.131 (0.035)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,914	14,958	2,056	7,113	888	1,206	3,687	1,772	301
<i>Adj R<sup>2</sup></i>	0.690	0.503	0.508	0.654	0.676	0.852	0.601	0.695	0.548	0.594	0.663	0.773	0.496
<i>F-statistics (instruments)</i>	4.404	3.876	0.645	11.451	9.246	25.228	2.896	57.631	1.706	2.628	31.034	0.261	1.494

*Note:* Results are first stage estimates of IV-regressions. The first four rows show the results for the instrument variables. Standard errors in parentheses. Standard errors computed based on replicate weights. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary educ. FI & MT excluded due to data availability limitations.

*Source:* HFCS (2010).

**Table 8** – Instrumental Variable Probit Regression

<i>Dependent variable:</i>	<b>Pr(debt &gt; 0)</b>												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Relative deprivation, ihs-transformed</i>	0.081 (0.212)	0.216 (0.161)	-0.018 (0.287)	0.275 (0.090)	0.444 (0.191)	0.057 (0.075)	-0.140 (0.065)	-0.068 (0.012)	0.236 (0.407)	0.428 (0.264)	0.131 (0.032)	0.121 (0.160)	-0.339 (0.340)
<i>Relative deprivation residuals (1<sup>st</sup> stage)</i>	-0.049 (0.213)	-0.151 (0.162)	0.000 (0.287)	-0.226 (0.091)	-0.460 (0.193)	0.137 (0.075)	0.108 (0.065)	0.067 (0.012)	-0.250 (0.407)	-0.449 (0.264)	-0.052 (0.034)	0.038 (0.160)	0.312 (0.341)
<i>Gross income, ihs-transformed</i>	0.085 (0.203)	0.102 (0.039)	0.027 (0.093)	0.107 (0.049)	0.082 (0.032)	0.106 (0.042)	-0.028 (0.026)	-0.029 (0.008)	0.104 (0.125)	0.355 (0.235)	0.123 (0.009)	0.233 (0.175)	-0.042 (0.050)
<i>Age household head</i>	-0.002 (0.000)	0.001 (0.001)	-0.006 (0.001)	-0.004 (0.000)	-0.002 (0.000)	-0.002 (0.000)	-0.002 (0.000)	-0.002 (0.000)	-0.004 (0.002)	-0.004 (0.002)	-0.002 (0.000)	-0.001 (0.000)	-0.006 (0.001)
<i>Female household head</i>	-0.005 (0.005)	0.015 (0.005)	-0.065 (0.021)	-0.050 (0.007)	-0.004 (0.005)	-0.006 (0.001)	-0.010 (0.003)	-0.034 (0.001)	-0.053 (0.031)	-0.067 (0.055)	-0.029 (0.003)	-0.013 (0.006)	-0.063 (0.039)
<i>Primary educ or below</i>	0.341 (0.014)	-0.072 (0.016)	0.045 (0.037)	-0.036 (0.017)	-0.024 (0.011)	-0.034 (0.001)	-0.033 (0.007)	0.000 (0.002)	-0.203 (0.056)	0.073 (0.043)	0.000 (0.005)	-	-
<i>Upper secondary educ</i>	0.069 (0.010)	0.016 (0.009)	0.076 (0.017)	0.037 (0.010)	0.017 (0.009)	0.023 (0.001)	0.002 (0.010)	-0.017 (0.002)	-0.137 (0.041)	0.060 (0.037)	0.038 (0.006)	0.141 (0.012)	0.087 (0.079)
<i>Tertiary educ</i>	0.022 (0.027)	0.027 (0.028)	0.090 (0.060)	0.017 (0.017)	0.076 (0.026)	-0.045 (0.003)	-0.070 (0.021)	-0.038 (0.006)	-0.154 (0.080)	0.081 (0.084)	0.041 (0.017)	0.090 (0.023)	0.009 (0.052)
<i>Age diff. within HH</i>	0.000 (0.001)	0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001 (0.000)	0.000 (0.000)	-0.002 (0.001)	-0.002 (0.002)	0.001 (0.000)	0.002 (0.001)	0.002 (0.003)
<i>Educ diff. within HH</i>	0.006 (0.003)	0.020 (0.002)	-	-0.015 (0.003)	0.005 (0.003)	0.014 (0.001)	0.018 (0.002)	0.002 (0.001)	0.017 (0.015)	-0.017 (0.016)	-0.006 (0.001)	0.012 (0.002)	-0.034 (0.029)
<i>Married household head</i>	-0.049 (0.020)	-0.015 (0.008)	-0.019 (0.018)	-0.020 (0.006)	0.002 (0.007)	0.022 (0.002)	-0.013 (0.004)	-0.003 (0.002)	0.041 (0.021)	0.082 (0.036)	-0.039 (0.002)	-0.022 (0.012)	-0.095 (0.068)
<i># of adults</i>	-0.014 (0.053)	-0.018 (0.022)	0.027 (0.051)	0.001 (0.018)	0.007 (0.015)	-0.019 (0.011)	0.055 (0.014)	0.034 (0.003)	-0.011 (0.069)	-0.152 (0.100)	-0.014 (0.005)	-0.058 (0.042)	0.105 (0.048)
<i># of children</i>	0.005 (0.031)	0.019 (0.023)	0.012 (0.042)	-0.043 (0.014)	-0.030 (0.015)	-0.007 (0.007)	0.078 (0.013)	0.037 (0.003)	-0.008 (0.043)	-0.102 (0.062)	-0.007 (0.004)	-0.064 (0.022)	0.014 (0.030)
<i>Inheritance received</i>	0.055 (0.005)	-0.080 (0.006)	0.025 (0.017)	0.023 (0.005)	-0.043 (0.005)	-0.006 (0.001)	-0.122 (0.008)	-	-0.039 (0.018)	0.035 (0.051)	-0.022 (0.002)	0.006 (0.002)	0.021 (0.030)
<i>Savings account</i>	0.085 (0.012)	-0.001 (0.012)	0.019 (0.010)	0.016 (0.007)	-0.014 (0.006)	0.087 (0.003)	0.041 (0.008)	0.024 (0.001)	-0.081 (0.017)	-0.027 (0.037)	-0.033 (0.002)	-0.033 (0.004)	-0.086 (0.044)
<i>Self-employed</i>	0.077 (0.015)	0.039 (0.039)	0.088 (0.024)	0.088 (0.016)	0.015 (0.007)	-0.057 (0.005)	0.002 (0.012)	-0.008 (0.003)	-0.026 (0.107)	-0.080 (0.073)	-0.034 (0.003)	-0.012 (0.051)	-0.090 (0.093)
<i>Employment share within HH</i>	0.001 (0.001)	0.005 (0.003)	0.004 (0.004)	0.007 (0.001)	0.009 (0.002)	0.007 (0.000)	-0.003 (0.002)	0.001 (0.000)	0.004 (0.006)	0.011 (0.006)	0.002 (0.001)	0.000 (0.001)	-0.016 (0.017)
<i>% with more jobs</i>	0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	-0.001 (0.000)	0.001 (0.001)	0.002 (0.001)	0.000 (0.000)	0.001 (0.000)	0.001 (0.002)
<i>Informal fin. assistance</i>	-0.046 (0.005)	0.014 (0.009)	-0.037 (0.020)	-0.042 (0.004)	-	-	-0.017 (0.005)	-	0.024 (0.017)	-0.124 (0.028)	-0.009 (0.001)	-0.008 (0.006)	-0.097 (0.077)
<i>Low income expectations</i>	0.033 (0.003)	0.021 (0.011)	0.016 (0.020)	0.036 (0.008)	-0.042 (0.005)	-	0.019 (0.005)	0.032 (0.001)	0.012 (0.018)	-0.004 (0.024)	0.010 (0.002)	-0.016 (0.003)	0.052 (0.139)
<i>Transitory shock</i>	0.073 (0.005)	0.084 (0.012)	-0.019 (0.046)	0.007 (0.008)	0.005 (0.005)	-	0.020 (0.006)	0.030 (0.002)	-0.034 (0.019)	-0.014 (0.049)	0.043 (0.002)	0.016 (0.010)	0.058 (0.084)
<i>Low asset constraint</i>	0.131 (0.018)	0.029 (0.026)	0.126 (0.085)	0.223 (0.010)	0.133 (0.026)	0.111 (0.002)	0.134 (0.027)	0.093 (0.004)	0.028 (0.074)	0.177 (0.070)	0.160 (0.009)	0.082 (0.014)	-0.166 (0.165)
<i>Financial assets, ihs-transformed</i>	-0.020 (0.004)	-0.022 (0.003)	-0.012 (0.007)	-0.007 (0.003)	-0.006 (0.003)	-0.042 (0.001)	-0.033 (0.002)	-0.009 (0.000)	-0.004 (0.018)	-0.001 (0.017)	0.001 (0.002)	-0.023 (0.002)	-0.045 (0.015)
<i>Real assets, ihs-transformed</i>	0.000 (0.003)	-0.006 (0.004)	-0.009 (0.017)	0.008 (0.003)	0.021 (0.006)	0.010 (0.000)	0.015 (0.006)	0.009 (0.001)	0.005 (0.028)	0.014 (0.016)	0.008 (0.002)	-0.012 (0.003)	-0.002 (0.044)
<i>Observations</i>	2036	2100	1122	3127	5914	14958	2056	7113	888	1206	3687	1772	301
<i>Wald-test of exogeneity (statistics)</i>	0.144	0.516	1.197	1.057	1.638	0.171	0.338	0.660	0.264	2.277	0.336	0.018	0.836

*Note:* Standard errors in parentheses. Standard errors computed based on replicate weights. The following instruments are applied: household main residence and business income (AT, BE, DE, ES); high-income employment rates in age cohorts, education gap (gap of max educ in HH to highest possible educ) and its interaction (CY, FR, GR, IT, LU, NL, PT, SK, SI). *relative deprivation residuals* were extracted from 1<sup>st</sup> stage from IV-regressions. Results of 1<sup>st</sup> stage from IV-regressions are reported in Table 7. Critical value for  $\chi^2$  (Wald-test of exogeneity) at 90% significance level: 2.706. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary educ. FI & MT excluded due to data availability limitations.

*Source:* HFCS (2010).



**Table 9** – Instrumental Variable Tobit Regression

<i>Dependent variable:</i>	E(ihs(debt)   debt > 0)												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Relative deprivation, ihs-transformed</i>	0.826 (1.889)	2.224 (1.589)	-1.461 (2.092)	2.820 (0.968)	4.275 (1.849)	1.032 (0.766)	-1.526 (0.721)	-0.740 (0.128)	2.758 (4.070)	3.721 (2.409)	1.127 (0.298)	0.414 (1.394)	-3.393 (3.014)
<i>Relative deprivation residuals (1<sup>st</sup> stage)</i>	-0.577 (1.890)	-1.578 (1.590)	1.210 (2.092)	-2.382 (0.980)	-4.475 (1.863)	1.087 (0.774)	1.184 (0.725)	0.720 (0.128)	-2.862 (4.074)	-3.893 (2.412)	-0.417 (0.311)	0.794 (1.397)	3.168 (3.028)
<i>Gross income, ihs-transformed</i>	0.810 (1.797)	1.006 (0.381)	0.005 (0.670)	1.100 (0.522)	0.798 (0.305)	1.261 (0.426)	-0.310 (0.290)	-0.311 (0.086)	1.244 (1.268)	3.088 (2.182)	1.111 (0.082)	1.299 (1.529)	-0.383 (0.439)
<i>Age household head</i>	-0.012 (0.002)	0.013 (0.006)	-0.064 (0.011)	-0.034 (0.003)	-0.023 (0.003)	-0.015 (0.001)	-0.020 (0.004)	-0.019 (0.001)	-0.029 (0.025)	-0.031 (0.017)	-0.022 (0.002)	-0.008 (0.002)	-0.045 (0.013)
<i>Female household head</i>	-0.056 (0.045)	0.129 (0.053)	-0.752 (0.200)	-0.507 (0.071)	-0.018 (0.045)	-0.070 (0.008)	-0.099 (0.036)	-0.312 (0.014)	-0.649 (0.315)	-0.610 (0.468)	-0.272 (0.025)	-0.089 (0.056)	-0.401 (0.373)
<i>Primary educ or below</i>	2.373 (0.129)	-0.733 (0.159)	0.563 (0.298)	-0.304 (0.181)	-0.246 (0.103)	-0.338 (0.013)	-0.276 (0.083)	0.012 (0.020)	-2.048 (0.552)	0.691 (0.392)	-0.007 (0.046)	-5.944 (0.392)	-19.521 (1.165)
<i>Upper secondary educ</i>	0.581 (0.086)	0.170 (0.090)	0.731 (0.152)	0.327 (0.110)	0.172 (0.083)	0.199 (0.010)	0.061 (0.115)	-0.159 (0.023)	-1.275 (0.408)	0.525 (0.330)	0.305 (0.056)	1.045 (0.110)	0.569 (0.687)
<i>Tertiary educ</i>	0.168 (0.242)	0.278 (0.273)	0.601 (0.441)	0.097 (0.187)	0.738 (0.249)	-0.424 (0.030)	-0.686 (0.235)	-0.384 (0.064)	-1.473 (0.811)	0.652 (0.711)	0.346 (0.159)	0.643 (0.209)	-0.171 (0.443)
<i>Age diff. within HH</i>	-0.002 (0.005)	-0.002 (0.003)	-0.005 (0.008)	0.001 (0.003)	0.000 (0.002)	-0.001 (0.001)	-0.012 (0.002)	0.005 (0.001)	-0.027 (0.009)	-0.007 (0.018)	0.010 (0.001)	0.015 (0.006)	0.020 (0.024)
<i>Educ diff. within HH</i>	0.065 (0.030)	0.199 (0.022)	- (-)	-0.124 (0.032)	0.065 (0.025)	0.129 (0.007)	0.169 (0.023)	0.012 (0.008)	0.185 (0.147)	-0.180 (0.143)	-0.054 (0.008)	0.085 (0.019)	-0.326 (0.279)
<i>Married household head</i>	-0.420 (0.185)	-0.136 (0.078)	-0.135 (0.198)	-0.190 (0.063)	0.040 (0.064)	0.191 (0.016)	-0.145 (0.049)	-0.010 (0.017)	0.442 (0.214)	0.773 (0.316)	-0.348 (0.018)	-0.117 (0.106)	-0.751 (0.534)
<i># of adults</i>	-0.175 (0.470)	-0.238 (0.214)	0.454 (0.382)	-0.079 (0.191)	0.077 (0.150)	-0.224 (0.113)	0.600 (0.153)	0.339 (0.035)	-0.220 (0.694)	-1.361 (0.918)	-0.123 (0.044)	-0.325 (0.366)	1.017 (0.466)
<i># of children</i>	-0.009 (0.273)	0.127 (0.231)	0.245 (0.279)	-0.458 (0.148)	-0.316 (0.150)	-0.116 (0.074)	0.781 (0.148)	0.349 (0.028)	-0.137 (0.432)	-0.937 (0.562)	-0.078 (0.033)	-0.415 (0.196)	0.125 (0.284)
<i>Inheritance received</i>	0.514 (0.047)	-0.808 (0.062)	0.326 (0.170)	0.211 (0.058)	-0.443 (0.050)	-0.093 (0.005)	-1.211 (0.084)	- (-)	-0.490 (0.175)	0.287 (0.452)	-0.209 (0.019)	0.027 (0.025)	0.203 (0.282)
<i>Savings account</i>	0.659 (0.109)	-0.019 (0.114)	0.115 (0.148)	0.076 (0.075)	-0.163 (0.055)	0.798 (0.026)	0.340 (0.084)	0.227 (0.014)	-0.823 (0.170)	-0.321 (0.320)	-0.312 (0.013)	-0.251 (0.039)	-0.819 (0.415)
<i>Self-employed</i>	0.706 (0.140)	0.408 (0.383)	0.879 (0.274)	0.866 (0.169)	0.159 (0.067)	-0.541 (0.053)	-0.009 (0.137)	-0.073 (0.027)	-0.209 (1.076)	-0.712 (0.661)	-0.309 (0.024)	-0.264 (0.451)	-0.863 (0.827)
<i>Employment share within HH</i>	0.015 (0.008)	0.048 (0.026)	0.021 (0.035)	0.077 (0.010)	0.086 (0.020)	0.070 (0.003)	-0.034 (0.026)	0.003 (0.004)	0.056 (0.065)	0.098 (0.048)	0.019 (0.005)	-0.003 (0.012)	-0.161 (0.153)
<i>% with more jobs</i>	0.010 (0.001)	0.001 (0.004)	0.001 (0.004)	0.000 (0.002)	-0.006 (0.001)	0.008 (0.000)	0.008 (0.003)	-0.005 (0.001)	0.008 (0.007)	0.016 (0.007)	0.003 (0.001)	0.010 (0.001)	0.001 (0.021)
<i>Informal fin. assistance</i>	-0.389 (0.049)	0.089 (0.089)	-0.423 (0.209)	-0.357 (0.045)	- (-)	- (-)	-0.173 (0.053)	- (-)	0.236 (0.164)	-1.105 (0.249)	-0.096 (0.011)	-0.045 (0.059)	-0.907 (0.687)
<i>Low income expectations</i>	0.281 (0.033)	0.168 (0.114)	0.259 (0.155)	0.309 (0.083)	-0.415 (0.053)	- (-)	0.218 (0.055)	0.324 (0.013)	0.132 (0.182)	-0.032 (0.212)	0.070 (0.016)	-0.116 (0.030)	0.492 (1.142)
<i>Transitory shock</i>	0.631 (0.052)	0.762 (0.117)	0.010 (0.377)	0.117 (0.080)	0.029 (0.052)	0.207 (-)	0.279 (0.072)	0.279 (0.022)	-0.328 (0.190)	-0.191 (0.439)	0.375 (0.019)	0.172 (0.085)	0.628 (0.717)
<i>Low asset constraint</i>	1.184 (0.157)	0.322 (0.258)	1.066 (0.458)	2.141 (0.107)	1.298 (0.257)	1.157 (0.014)	1.145 (0.296)	0.848 (0.043)	0.486 (0.755)	1.726 (0.586)	1.377 (0.080)	0.614 (0.118)	-1.304 (1.515)
<i>Financial assets, ihs-transformed</i>	-0.147 (0.032)	-0.178 (0.032)	-0.162 (0.045)	-0.033 (0.034)	-0.063 (0.025)	-0.357 (0.009)	-0.320 (0.024)	-0.092 (0.004)	-0.030 (0.172)	0.009 (0.152)	0.011 (0.020)	-0.172 (0.019)	-0.370 (0.132)
<i>Real assets, ihs-transformed</i>	0.004 (0.029)	-0.035 (0.041)	-0.163 (0.121)	0.088 (0.032)	0.211 (0.062)	0.112 (0.004)	0.125 (0.067)	0.075 (0.010)	0.097 (0.289)	0.123 (0.149)	0.077 (0.016)	-0.069 (0.025)	-0.073 (0.401)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,916	14,958	2,056	7,113	888	1,206	3,687	1,777	315
<i>Wald-test of exogeneity (statistics)</i>	0.158	0.560	0.014	1.038	1.471	0.228	0.418	0.732	0.343	2.005	0.245	0.050	1.101

*Note:* Standard errors in parentheses. Standard errors computed based on replicate weights. The following instruments are applied: household main residence and business income (AT, BE, DE, ES); high-income employment rates in age cohorts, education gap (gap of max educ in HH to highest possible educ) and its interaction (CY, FR, GR, IT, LU, NL, PT, SK, SI). *relative deprivation residuals* were extracted from 1<sup>st</sup> stage from IV-regressions. Results of 1<sup>st</sup> stage from IV-regressions are reported in Table 7. Critical value for  $\chi^2$  (Wald-test of exogeneity) at 90% significance level: 2.706. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary educ. FI & MT excluded due to data availability limitations.

*Source:* HFCS (2010).

## Appendix – Multilevel Regression Results

**Table 10** – Multilevel Estimation

<i>Dependent variable:</i>		<b>Probit</b>	<b>Tobit</b>	
		<b>Pr(debt &gt; 0)</b>	<b>E(ihs(debt)   debt&gt;0)</b>	
<b>Household-level covariates:</b>	<i>Relative deprivation, ihs-transformed</i>	0.020 (0.010)	0.196 (0.102)	
	<i>Gross income, ihs-transformed</i>	0.020 (0.013)	0.210 (0.131)	
	<i>Age household head</i>	-0.003 (0.000)	-0.022 (0.004)	
	<i>Female household head</i>	-0.023 (0.009)	-0.226 (0.086)	
	<i>Primary educ or below</i>	- (-)	- (-)	
	<i>Upper secondary educ</i>	0.020 (0.013)	0.194 (0.125)	
	<i>Tertiary educ</i>	0.040 (0.010)	0.386 (0.092)	
	<i>Age diff. within HH</i>	0.000 (0.000)	0.004 (0.004)	
	<i>Educ diff. within HH</i>	0.005 (0.004)	0.053 (0.035)	
	<i>Married household head</i>	-0.002 (0.011)	-0.013 (0.104)	
	<i># of adults</i>	0.015 (0.009)	0.135 (0.085)	
	<i># of children</i>	0.002 (0.007)	0.005 (0.069)	
	<i>Inheritance received</i>	-0.004 (0.011)	-0.039 (0.105)	
	<i>Savings account</i>	0.009 (0.013)	0.066 (0.124)	
	<i>Self-employed</i>	0.004 (0.014)	0.040 (0.133)	
	<i>Employment share within HH</i>	0.005 (0.001)	0.051 (0.010)	
	<i>% with more jobs</i>	0.000 (0.000)	0.003 (0.003)	
	<i>Informal fin. assistance</i>	-0.046 (0.017)	-0.411 (0.151)	
	<i>Low income expectations</i>	0.032 (0.010)	0.307 (0.093)	
	<i>Transitory shock</i>	0.020 (0.012)	0.201 (0.113)	
	<i>Low assets constraint</i>	0.135 (0.022)	1.274 (0.191)	
	<i>Financial assets, ihs-transformed</i>	-0.016 (0.002)	-0.146 (0.020)	
	<i>Real assets, ihs-transformed</i>	0.006 (0.004)	0.065 (0.038)	
	<b>Country-level covariates:</b>	<i>Private credit in % of GDP</i>	0.000 (0.000)	0.001 (0.002)
		<i>Resid. price index</i>	0.000 (0.000)	-0.001 (0.002)
		<i>Public social expenditures in % of GDP</i>	0.008 (0.003)	0.080 (0.029)
		<i>Real long-term interest rate</i>	-0.058 (0.019)	-0.522 (0.187)
	<i>Observations</i>	46,290	46,290	
	<i># of countries</i>	13	13	
	<i>Log-likelihood</i>	-55,346,816	-135,841,115	

*Note:* Results are reported as (conditional) average marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. Results for “NA”-categories and “negative income” dummy are not shown. For *primary educ or below* we cannot compute average marginal effects due to high correlation. Country-level covariates are average values over the period 2005-2010. Basegroup: lower secondary education of household head.

*Source:* HFCS (2010), World Bank, OECD, BIS, Eurostat.

# Appendix – Robustness-Checks

Table 11 – Probit Estimation – Alternative RD Measure

<i>Dependent variable:</i>	Pr(debt > 0)												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Ratio – own income to average income</i>	-0.00025 (0.00024)	-0.00026 (0.00014)	0.00004 (0.00044)	-0.00050 (0.00040)	-0.00021 (0.00017)	-0.00066 (0.00018)	0.00014 (0.00018)	0.00000 (0.00010)	-0.00008 (0.00030)	0.00031 (0.00053)	-0.00039 (0.00016)	-0.00101 (0.00040)	0.00030 (0.00022)
<i>Gross income, ihs-transformed</i>	0.053 (0.036)	0.050 (0.022)	0.033 (0.068)	0.022 (0.046)	0.018 (0.018)	0.113 (0.025)	0.016 (0.025)	0.001 (0.011)	0.057 (0.038)	-0.013 (0.041)	0.078 (0.020)	0.154 (0.049)	0.002 (0.008)
<i>Age household head</i>	-0.002 (0.001)	0.001 (0.001)	-0.006 (0.002)	-0.004 (0.001)	-0.003 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.005 (0.002)	-0.005 (0.002)	-0.003 (0.001)	-0.001 (0.001)	-0.006 (0.002)
<i>Female household head</i>	-0.003 (0.020)	0.021 (0.021)	-0.063 (0.041)	-0.040 (0.023)	0.005 (0.017)	-0.006 (0.012)	-0.006 (0.012)	-0.014 (0.019)	-0.037 (0.009)	-0.032 (0.035)	-0.001 (0.041)	-0.025 (0.017)	-0.016 (0.016)
<i>Primary educ or below</i>	0.350 (0.225)	-0.060 (0.058)	0.047 (0.102)	-0.056 (0.154)	-0.008 (0.023)	-0.034 (0.024)	-0.041 (0.032)	-0.006 (0.019)	-0.166 (0.068)	0.090 (0.111)	0.007 (0.020)	-	-
<i>Upper secondary educ</i>	0.065 (0.029)	0.010 (0.033)	0.079 (0.076)	0.024 (0.038)	0.004 (0.024)	0.023 (0.023)	0.021 (0.030)	-0.008 (0.013)	-0.117 (0.058)	0.008 (0.045)	0.027 (0.019)	0.138 (0.100)	0.023 (0.057)
<i>Tertiary educ</i>	0.009 (0.041)	-0.001 (0.034)	0.093 (0.075)	-0.020 (0.053)	0.020 (0.026)	-0.042 (0.024)	-0.027 (0.033)	-0.005 (0.022)	-0.206 (0.070)	-0.038 (0.052)	0.011 (0.025)	0.090 (0.103)	0.014 (0.068)
<i>Age diff. within HH</i>	0.000 (0.001)	0.000 (0.001)	-0.001 (0.002)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	0.002 (0.001)	0.000 (0.002)
<i>Educ diff. within HH</i>	0.006 (0.014)	0.021 (0.012)	-	-0.011 (0.011)	0.009 (0.007)	0.013 (0.006)	0.017 (0.010)	0.003 (0.007)	0.025 (0.017)	-0.009 (0.018)	-0.007 (0.006)	0.011 (0.012)	-0.017 (0.023)
<i>Married household head</i>	-0.049 (0.024)	-0.018 (0.025)	-0.021 (0.053)	-0.023 (0.032)	0.008 (0.022)	0.022 (0.015)	-0.010 (0.024)	-0.003 (0.044)	0.044 (0.047)	0.105 (0.044)	-0.037 (0.019)	-0.020 (0.021)	-0.093 (0.052)
<i># of adults</i>	-0.002 (0.020)	0.008 (0.018)	0.024 (0.030)	0.036 (0.029)	0.039 (0.015)	-0.021 (0.012)	0.028 (0.020)	0.017 (0.011)	0.025 (0.031)	0.000 (0.033)	0.001 (0.010)	-0.041 (0.016)	0.059 (0.035)
<i># of children</i>	0.014 (0.020)	0.042 (0.016)	0.010 (0.030)	-0.014 (0.025)	0.005 (0.016)	-0.009 (0.010)	0.053 (0.018)	0.022 (0.011)	0.018 (0.027)	-0.010 (0.033)	0.003 (0.011)	-0.056 (0.017)	-0.015 (0.036)
<i>Inheritance received</i>	0.053 (0.021)	-0.080 (0.020)	0.030 (0.042)	0.030 (0.030)	-0.043 (0.024)	-0.006 (0.012)	-0.125 (0.045)	-	-0.049 (0.047)	0.009 (0.051)	-0.019 (0.015)	0.005 (0.018)	0.029 (0.045)
<i>Savings account</i>	0.091 (0.048)	0.009 (0.028)	0.020 (0.039)	0.011 (0.038)	-0.020 (0.021)	0.083 (0.022)	0.050 (0.048)	0.022 (0.012)	-0.083 (0.041)	-0.006 (0.058)	-0.032 (0.019)	-0.036 (0.022)	-0.107 (0.050)
<i>Self-employed</i>	0.075 (0.032)	0.019 (0.045)	0.095 (0.047)	0.059 (0.041)	0.011 (0.025)	-0.048 (0.020)	0.018 (0.024)	0.004 (0.019)	-0.094 (0.054)	-0.007 (0.097)	-0.034 (0.021)	0.006 (0.029)	-0.058 (0.055)
<i>Employment share within HH</i>	0.000 (0.002)	0.002 (0.003)	0.005 (0.005)	0.006 (0.003)	0.004 (0.002)	0.007 (0.001)	0.002 (0.002)	0.002 (0.001)	-0.001 (0.005)	0.006 (0.004)	0.001 (0.001)	0.000 (0.002)	0.003 (0.004)
<i>% with more jobs</i>	0.001 (0.000)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	0.002 (0.001)	0.000 (0.000)	0.001 (0.000)	0.003 (0.003)
<i>Informal fin. assistance</i>	-0.048 (0.016)	0.010 (0.029)	-0.039 (0.040)	-0.048 (0.026)	-	-	-0.010 (0.020)	-	0.017 (0.044)	-0.128 (0.038)	-0.009 (0.016)	-0.009 (0.018)	-0.047 (0.046)
<i>Low income expectations</i>	0.033 (0.019)	0.026 (0.021)	0.015 (0.034)	0.050 (0.021)	-0.041 (0.024)	-	0.010 (0.020)	0.029 (0.013)	0.012 (0.034)	-0.007 (0.046)	0.008 (0.013)	-0.017 (0.015)	0.126 (0.039)
<i>Transitory shock</i>	0.072 (0.028)	0.089 (0.026)	-0.024 (0.041)	0.001 (0.029)	0.013 (0.020)	-	0.008 (0.022)	0.025 (0.014)	-0.012 (0.045)	0.026 (0.070)	0.046 (0.015)	0.020 (0.019)	-0.028 (0.037)
<i>Low asset constraint</i>	0.125 (0.032)	0.001 (0.046)	0.125 (0.110)	0.208 (0.040)	0.077 (0.037)	0.114 (0.026)	0.190 (0.044)	0.107 (0.036)	-0.018 (0.079)	0.090 (0.054)	0.147 (0.029)	0.086 (0.041)	-0.006 (0.110)
<i>Financial assets, ihs-transformed</i>	-0.022 (0.006)	-0.025 (0.006)	-0.012 (0.010)	-0.015 (0.009)	-0.011 (0.003)	-0.041 (0.004)	-0.029 (0.005)	-0.007 (0.002)	-0.016 (0.012)	-0.029 (0.010)	-0.002 (0.005)	-0.023 (0.004)	-0.035 (0.006)
<i>Real assets, ihs-transformed</i>	-0.002 (0.006)	-0.011 (0.007)	-0.009 (0.015)	0.002 (0.007)	0.008 (0.007)	0.010 (0.004)	0.027 (0.011)	0.013 (0.004)	-0.009 (0.014)	-0.010 (0.010)	0.006 (0.005)	-0.010 (0.007)	0.042 (0.019)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,914	14,958	2,056	7,113	888	1,206	3,687	1,772	301
<i>Pseudo-R<sup>2</sup></i>	0.165	0.168	0.136	0.142	0.110	0.134	0.158	0.107	0.110	0.124	0.147	0.147	0.203

*Note:* Results are reported as average marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. *Ratio – own income to average income* is calculated based on equalised household income. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary education of household head.

*Source:* HFCS (2010).

**Table 12** – Tobit Estimation – Alternative RD Measure

<i>Dependent variable:</i>	E(ths(debt)   debt > 0)												
	AT	BE	CY	DE	ES	FR	GR	IT	LU	NL	PT	SK	SI
<i>Ratio – own income to average income</i>	-0.00224 (0.00213)	-0.00272 (0.00139)	0.00071 (0.00478)	-0.00466 (0.00401)	-0.00194 (0.00152)	-0.00627 (0.00192)	0.00136 (0.00166)	0.00014 (0.00095)	-0.00131 (0.00345)	0.00260 (0.00494)	-0.00348 (0.00146)	-0.00740 (0.00310)	0.00244 (0.00203)
<i>Gross income, ihs-transformed</i>	0.473 (0.323)	0.482 (0.221)	0.432 (0.795)	0.210 (0.446)	0.186 (0.164)	1.085 (0.238)	0.168 (0.257)	0.018 (0.103)	0.708 (0.418)	-0.114 (0.381)	0.731 (0.178)	1.156 (0.371)	0.064 (0.063)
<i>Age household head</i>	-0.011 (0.006)	0.013 (0.010)	-0.057 (0.020)	-0.032 (0.011)	-0.028 (0.008)	-0.016 (0.005)	-0.014 (0.009)	-0.017 (0.005)	-0.048 (0.020)	-0.045 (0.019)	-0.025 (0.010)	-0.008 (0.005)	-0.049 (0.013)
<i>Female household head</i>	-0.033 (0.175)	0.184 (0.200)	-0.781 (0.445)	-0.396 (0.218)	0.063 (0.174)	-0.070 (0.114)	-0.138 (0.184)	-0.352 (0.085)	-0.411 (0.361)	-0.031 (0.369)	-0.239 (0.158)	-0.121 (0.119)	-0.743 (0.331)
<i>Primary educ or below</i>	2.469 (1.405)	-0.614 (0.535)	0.442 (1.163)	-0.519 (4.283)	-0.091 (0.236)	-0.327 (0.223)	-0.367 (0.334)	-0.055 (0.184)	-1.619 (0.664)	0.825 (1.018)	0.052 (0.183)	-5.638 (1.049)	-20.079 (1.354)
<i>Upper secondary educ</i>	0.531 (0.257)	0.109 (0.307)	0.783 (0.876)	0.201 (0.347)	0.046 (0.242)	0.202 (0.213)	0.267 (0.291)	-0.060 (0.119)	-1.045 (0.542)	0.079 (0.416)	0.211 (0.171)	1.043 (0.768)	-0.075 (0.514)
<i>Tertiary educ</i>	0.033 (0.366)	-0.019 (0.322)	0.912 (0.869)	-0.293 (0.483)	0.196 (0.260)	-0.415 (0.226)	-0.207 (0.331)	-0.036 (0.208)	-2.068 (0.681)	-0.382 (0.483)	0.106 (0.224)	0.699 (0.791)	-0.118 (0.635)
<i>Age diff. within HH</i>	-0.001 (0.008)	0.000 (0.010)	-0.010 (0.023)	0.005 (0.014)	0.002 (0.007)	0.000 (0.005)	-0.013 (0.011)	0.005 (0.006)	-0.025 (0.019)	0.021 (0.019)	0.011 (0.004)	0.015 (0.007)	0.000 (0.018)
<i>Educ diff. within HH</i>	0.059 (0.127)	0.208 (0.117)	-	-0.081 (0.107)	0.094 (0.066)	0.124 (0.059)	0.156 (0.104)	0.021 (0.062)	0.284 (0.182)	-0.103 (0.167)	-0.062 (0.058)	0.082 (0.091)	-0.155 (0.202)
<i>Married household head</i>	-0.424 (0.215)	-0.167 (0.230)	-0.093 (0.572)	-0.214 (0.307)	0.100 (0.218)	0.203 (0.133)	-0.104 (0.230)	-0.011 (0.134)	0.482 (0.508)	0.975 (0.401)	-0.331 (0.175)	-0.118 (0.152)	-0.737 (0.463)
<i># of adults</i>	-0.044 (0.166)	0.028 (0.168)	0.213 (0.305)	0.285 (0.266)	0.385 (0.140)	-0.177 (0.114)	0.306 (0.198)	0.159 (0.096)	0.193 (0.322)	-0.054 (0.312)	0.004 (0.085)	-0.317 (0.120)	0.553 (0.291)
<i># of children</i>	0.093 (0.161)	0.366 (0.143)	0.071 (0.325)	-0.153 (0.231)	0.018 (0.154)	-0.095 (0.090)	0.505 (0.177)	0.189 (0.102)	0.164 (0.269)	-0.145 (0.300)	0.010 (0.100)	-0.426 (0.124)	-0.158 (0.331)
<i>Inheritance received</i>	0.497 (0.189)	-0.809 (0.197)	0.294 (0.461)	0.279 (0.293)	-0.439 (0.244)	-0.095 (0.119)	-1.247 (0.470)	-	-0.608 (0.509)	0.062 (0.491)	-0.184 (0.135)	0.022 (0.139)	0.289 (0.402)
<i>Savings account</i>	0.720 (0.425)	0.084 (0.271)	0.150 (0.419)	0.028 (0.351)	-0.217 (0.212)	0.764 (0.209)	0.444 (0.479)	0.203 (0.114)	-0.836 (0.410)	-0.149 (0.549)	-0.302 (0.169)	-0.282 (0.167)	-1.032 (0.476)
<i>Self-employed</i>	0.679 (0.289)	0.195 (0.446)	0.982 (0.503)	0.565 (0.399)	0.127 (0.253)	-0.466 (0.199)	0.165 (0.230)	0.055 (0.179)	-0.986 (0.601)	-0.074 (0.895)	-0.309 (0.191)	0.053 (0.220)	-0.535 (0.508)
<i>Employment share</i>	0.007 (0.020)	0.017 (0.025)	0.042 (0.052)	0.058 (0.031)	0.044 (0.018)	0.066 (0.012)	0.017 (0.023)	0.021 (0.014)	0.000 (0.047)	0.059 (0.042)	0.011 (0.014)	0.002 (0.016)	0.032 (0.037)
<i>% with more jobs</i>	0.010 (0.004)	0.003 (0.006)	0.001 (0.011)	-0.001 (0.005)	-0.006 (0.007)	0.008 (0.005)	0.009 (0.005)	-0.004 (0.005)	0.008 (0.013)	0.019 (0.007)	0.003 (0.004)	0.010 (0.003)	0.019 (0.023)
<i>Informal fin. assistance</i>	-0.404 (0.143)	0.047 (0.273)	-0.483 (0.435)	-0.411 (0.237)	-	-	-0.095 (0.197)	-	0.153 (0.464)	-1.142 (0.346)	-0.095 (0.139)	-0.077 (0.134)	-0.380 (0.421)
<i>Low income expectations</i>	0.286 (0.173)	0.217 (0.209)	0.160 (0.370)	0.452 (0.199)	-0.408 (0.244)	-	0.120 (0.205)	0.290 (0.127)	0.131 (0.364)	-0.063 (0.422)	0.052 (0.119)	-0.129 (0.116)	1.259 (0.386)
<i>Transitory shock</i>	0.627 (0.236)	0.819 (0.246)	-0.154 (0.431)	0.054 (0.271)	0.108 (0.207)	-	0.072 (0.218)	0.231 (0.125)	-0.081 (0.481)	0.154 (0.615)	0.401 (0.135)	0.167 (0.140)	-0.222 (0.336)
<i>Low asset constraint</i>	1.116 (0.282)	0.027 (0.412)	1.424 (1.020)	1.976 (0.350)	0.759 (0.338)	1.174 (0.242)	1.749 (0.390)	1.004 (0.333)	-0.047 (0.792)	0.969 (0.491)	1.273 (0.242)	0.647 (0.283)	0.336 (1.054)
<i>Financial assets, ihs-transformed</i>	-0.171 (0.054)	-0.210 (0.046)	-0.127 (0.099)	-0.121 (0.073)	-0.114 (0.032)	-0.348 (0.034)	-0.279 (0.048)	-0.072 (0.015)	-0.170 (0.127)	-0.229 (0.083)	-0.017 (0.042)	-0.161 (0.031)	-0.265 (0.054)
<i>Real assets, ihs-transformed</i>	-0.014 (0.049)	-0.090 (0.071)	-0.072 (0.162)	0.026 (0.063)	0.088 (0.065)	0.114 (0.041)	0.255 (0.103)	0.125 (0.039)	-0.058 (0.147)	-0.080 (0.092)	0.055 (0.042)	-0.069 (0.054)	0.374 (0.182)
<i>Observations</i>	2,036	2,100	1,122	3,127	5,916	14,958	2,056	7,113	888	1,206	3,687	1,777	315
<i>Pseudo-R<sup>2</sup></i>	0.078	0.076	0.054	0.060	0.053	0.058	0.074	0.054	0.045	0.055	0.073	0.076	0.086

*Note:* Results are reported as average marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. *Ratio – own income to average income* is calculated based on equalised household income. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary education of household head.

*Source:* HFCS (2010).

**Table 13** – Probit Estimation – Applied for New Credit

<i>Dependent variable:</i>	Pr(Applied for New Credit > 0)											
	AT	BE	CY	DE	ES	FR	GR	LU	NL	PT	SK	SI
<i>Relative deprivation, ihs-transformed</i>	0.026 (0.049)	0.020 (0.039)	-0.039 (0.046)	0.030 (0.048)	-0.045 (0.042)	0.234 (0.062)	0.107 (0.041)	0.049 (0.072)	0.025 (0.063)	0.029 (0.034)	0.005 (0.044)	0.028 (0.021)
<i>Gross income, ihs-transformed</i>	0.029 (0.052)	0.014 (0.029)	0.010 (0.036)	0.042 (0.048)	-0.007 (0.011)	0.190 (0.041)	0.097 (0.051)	0.070 (0.053)	0.041 (0.121)	0.051 (0.036)	0.027 (0.055)	0.055 (0.029)
<i>Age household head</i>	-0.003 (0.001)	-0.006 (0.001)	-0.008 (0.002)	-0.005 (0.001)	-0.004 (0.001)	-0.005 (0.001)	-0.001 (0.001)	-0.011 (0.001)	-0.005 (0.002)	-0.006 (0.001)	0.003 (0.001)	-0.006 (0.001)
<i>Female household head</i>	0.011 (0.015)	-0.012 (0.017)	0.055 (0.038)	-0.007 (0.028)	0.005 (0.017)	-0.011 (0.012)	0.008 (0.015)	-0.043 (0.033)	-0.023 (0.032)	0.027 (0.022)	0.011 (0.030)	0.063 (0.032)
<i>Primary educ or below</i>	0.057 (0.175)	-0.067 (0.049)	0.178 (0.081)	0.144 (0.119)	0.012 (0.026)	-0.021 (0.029)	-0.069 (0.027)	0.055 (0.067)	-0.012 (0.207)	-0.060 (0.022)	0.096 (0.309)	0.257 (0.089)
<i>Upper secondary educ</i>	0.015 (0.020)	-0.035 (0.027)	0.062 (0.071)	0.069 (0.046)	0.027 (0.024)	0.022 (0.027)	-0.021 (0.021)	0.034 (0.060)	-0.035 (0.033)	-0.045 (0.028)	-0.062 (0.100)	0.046 (0.043)
<i>Tertiary educ</i>	0.033 (0.030)	-0.029 (0.026)	0.068 (0.067)	0.067 (0.052)	0.032 (0.028)	0.001 (0.028)	0.007 (0.026)	0.050 (0.065)	0.014 (0.036)	-0.015 (0.034)	-0.083 (0.101)	-0.005 (0.055)
<i>Age diff. within HH</i>	0.001 (0.001)	-0.001 (0.001)	0.004 (0.002)	0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.002 (0.002)	0.000 (0.002)	0.000 (0.001)	-0.004 (0.002)	0.003 (0.002)
<i>Educ diff. within HH</i>	0.003 (0.009)	-0.015 (0.009)	-	-0.003 (0.010)	-0.010 (0.007)	0.006 (0.006)	-0.004 (0.004)	0.025 (0.021)	0.019 (0.013)	0.001 (0.010)	0.017 (0.019)	0.021 (0.018)
<i>Married household head</i>	0.022 (0.019)	-0.052 (0.022)	-0.041 (0.057)	0.051 (0.026)	-0.048 (0.022)	0.001 (0.017)	0.032 (0.020)	0.023 (0.039)	-0.015 (0.037)	-0.016 (0.020)	-0.008 (0.037)	0.003 (0.044)
<i># of adults</i>	-0.019 (0.021)	-0.009 (0.016)	-0.002 (0.031)	-0.029 (0.031)	0.065 (0.013)	-0.051 (0.015)	-0.044 (0.020)	0.029 (0.034)	-0.015 (0.032)	0.035 (0.015)	0.048 (0.046)	-0.016 (0.029)
<i># of children</i>	-0.028 (0.014)	0.012 (0.014)	-0.027 (0.031)	-0.032 (0.016)	0.046 (0.022)	-0.021 (0.011)	-0.021 (0.015)	0.011 (0.026)	-0.017 (0.026)	0.009 (0.016)	0.051 (0.045)	0.004 (0.032)
<i>Inheritance received</i>	0.038 (0.017)	-0.004 (0.019)	0.002 (0.038)	-0.042 (0.024)	-0.015 (0.022)	-0.012 (0.012)	-0.036 (0.034)	-0.031 (0.040)	0.015 (0.039)	0.002 (0.020)	-0.070 (0.031)	-0.007 (0.042)
<i>Savings account</i>	0.011 (0.041)	0.011 (0.028)	-0.030 (0.041)	0.027 (0.039)	0.004 (0.021)	0.004 (0.021)	0.057 (0.026)	0.032 (0.053)	0.016 (0.041)	-0.047 (0.020)	0.049 (0.040)	-0.086 (0.045)
<i>Self-employed</i>	-0.005 (0.023)	-0.077 (0.033)	0.017 (0.054)	-0.056 (0.034)	0.026 (0.026)	-0.019 (0.020)	0.029 (0.021)	-0.045 (0.064)	0.003 (0.068)	0.032 (0.027)	0.139 (0.046)	-0.200 (0.052)
<i>Employment share within HH</i>	0.001 (0.002)	0.003 (0.002)	0.007 (0.004)	0.006 (0.003)	0.003 (0.002)	0.007 (0.001)	0.004 (0.002)	-0.004 (0.004)	-0.004 (0.003)	0.002 (0.002)	-0.010 (0.004)	0.007 (0.004)
<i>% with more jobs</i>	0.001 (0.000)	0.001 (0.000)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.000)	0.001 (0.001)	0.009 (0.002)
<i>Informal fin. assistance</i>	-0.014 (0.015)	0.009 (0.026)	0.007 (0.042)	-0.069 (0.021)	-	-	-0.010 (0.017)	0.093 (0.052)	0.030 (0.031)	0.006 (0.019)	0.106 (0.024)	-0.004 (0.040)
<i>Low income expectations</i>	0.001 (0.015)	-0.019 (0.021)	-0.040 (0.038)	-0.003 (0.020)	-0.008 (0.025)	-	0.013 (0.015)	-0.014 (0.038)	0.067 (0.039)	0.015 (0.016)	0.103 (0.027)	0.103 (0.038)
<i>Transitory shock</i>	0.048 (0.022)	-0.020 (0.029)	0.033 (0.041)	-0.016 (0.027)	0.047 (0.017)	-	0.007 (0.020)	-0.016 (0.052)	-0.059 (0.051)	0.006 (0.017)	0.019 (0.033)	0.024 (0.036)
<i>Low asset constraint</i>	0.068 (0.028)	-0.036 (0.062)	0.163 (0.101)	0.104 (0.044)	0.224 (0.054)	0.145 (0.028)	0.096 (0.052)	0.056 (0.100)	0.059 (0.045)	0.153 (0.038)	0.220 (0.098)	0.149 (0.090)
<i>Financial assets, ihs-transformed</i>	-0.003 (0.005)	-0.005 (0.004)	0.004 (0.011)	-0.011 (0.007)	-0.010 (0.004)	-0.028 (0.004)	-0.007 (0.004)	-0.018 (0.016)	-0.011 (0.008)	-0.001 (0.005)	-0.001 (0.010)	0.003 (0.005)
<i>Real assets, ihs-transformed</i>	0.023 (0.006)	0.074 (0.009)	0.041 (0.019)	0.037 (0.007)	0.037 (0.008)	0.040 (0.004)	0.033 (0.009)	0.028 (0.016)	0.031 (0.009)	0.027 (0.007)	-0.002 (0.020)	0.054 (0.019)
<i>Observations</i>	2,036	2,088	1,122	3,127	5,914	14,957	2,056	888	1,192	3,683	1,777	313
<i>Pseudo-R<sup>2</sup></i>	0.137	0.291	0.171	0.104	0.121	0.155	0.120	0.135	0.140	0.142	0.099	0.208

*Note:* Results are reported as average marginal effects. Standard errors in parentheses. Standard errors computed based on replicate weights. *Ratio – own income to average income* is calculated based on equivalised household income. Results for “NA”-categories and “negative income” dummy are not shown. Basegroup: lower secondary education of household head. IT does not provide information on “applied for a new credit”.

*Source:* HFCS (2010).

## IMPRESSUM

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