

# Income Expectations, Risk Attitudes and Household Borrowing Decisions

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# **Income expectations, risk attitudes and household borrowing decisions**

Eva Branten<sup>\*</sup>

## **Abstract**

This paper studies whether positive expectations for real income and risk aversion can provide information beyond that given by the main economic and sociodemographic characteristics for predicting whether a household applied for a loan or increased its outstanding liabilities. Microdata from the Eurosystem Household Finance and Consumption Survey (HFCS) are employed in the study, which covers a subgroup of the countries conducting the survey that have a panel component. The main estimation method used is a set of panel data fixed effects models. The estimation results imply that positive expectations for real income matter for increases in mortgage loans, but not for non-mortgage loans. Risk aversion is negatively related with the probability of applying for a loan but has no significant effect on an increase in debt.

JEL Codes: G51, D14

Keywords: household borrowing, financial expectations, risk attitudes, Eurosystem Household Finance and Consumption Survey

The views expressed are those of the authors and do not necessarily represent the official views of Eesti Pank or the Eurosystem.

This paper uses data from the Eurosystem Household Finance and Consumption Survey. The results published and the related observations and analysis may not correspond to the results or analysis of the data producers.

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## **Non-technical summary**

This paper investigates the relationships between financial expectations, risk attitudes and household borrowing. The aim of this study is to assess whether real income expectations and risk aversion provide significant additional information beyond that given by the main economic and sociodemographic characteristics of households, which can be used in predicting the borrowing of people in a group of European Union countries. The research question of this paper is important because excessive borrowing and debt repayment difficulties may stem from overly optimistic expectations and a willingness to take on too much financial risk, which could even lead borrowers into financial crisis.

The relationships between expectations and borrowing can be analysed theoretically through the lens of the Life-cycle/Permanent Income Hypothesis (Modigliani and Brumberg (1954), Friedman (1957)). The Life-cycle/Permanent Income Hypothesis posits that households try to hold their consumption levels stable over time at the level of their permanent income, and that they achieve that by borrowing and saving. The life-cycle model has been applied to show the theoretical relationship between optimistic expectations for income and the size of debt by Brown et al. (2005), which concludes that the relationship is positive. The theoretical relationship between risk aversion and the size of debt in Brown et al. (2013) is derived by solving the individual's lifetime expected utility maximisation problem. The model for this with mean-variance utility finds that the theoretical relationship depends on the values of the discounted expected returns on debt and assets, weighted by the variances and covariances.

My paper contributes to multiple strands of the literature. One contribution is that while the relationships between risk attitudes and debt stock sizes have been investigated previously (e.g. Brown et al. (2013), Massó and Abalde (2020), Branten (2022), Lagomarsino and Spiganti (2023)), my paper describes the new loans taken in a specific time period by employing flow variables. This study shows that quite a large share of households change their attitude to risk over time, and it may be informative to investigate the relationship between that attitude to risk and borrowing decisions in a particular period. Another contribution is that while some studies (e.g. Brown et al. (2005)) have investigated the role that expectations play in the growth in loans, my study applies a model that uses the panel component in the dataset and finds a causal logic by taking the values of the explanatory variables from the previous survey wave to the wave from which the dependent variables are taken. The panel data fixed effects models estimated in this study make it possible to control for the household time-invariant unobservable fixed effects. The questions about borrowing in my study include whether loans are applied for, and whether there is any increase in the size of the total debt, mortgage debt or non-mortgage debt.

The paper employs microdata from the 2010, 2014 and 2017 waves of the Eurosystem Household Finance and Consumption Survey (HFCS). Panel data fixed effects models are estimated using data on households from Belgium, Cyprus, Germany, Spain and Italy. Ten countries – Belgium, Cyprus, Germany, Estonia, Spain, France, Italy, Latvia, Poland and Slovakia – are included in the logit models that are estimated as a robustness check in the paper. Although more countries conduct the HFCS, these countries were chosen because they have a panel component in their dataset and cover the variables used in this study.

My study shows a statistically significant negative relationship between risk aversion and loan applications, as the probability of risk averse households applying for a loan is about three percentage points lower than the probability for other households. The effect of expectations

on loan applications is tentative, as some models imply a positive relationship, while others imply there is no significant relationship.

This study finds that optimistic expectations have quite a large effect on increases in the outstanding mortgage debt of households, while the effect on increases in non-mortgage debt is insignificant. This is intuitive since mortgage loans are large liabilities and the decision to buy property can often be postponed if financial circumstances are difficult. Non-mortgage loans are often smaller and may be needed urgently. The result of this study that optimistic expectations about future finances are positively related to an increase in the size of mortgage debt merits deeper analysis for the different countries separately in further studies. Hintermaier and Koeniger (2016) have, for example, developed a framework for analysing the home-equity positions in different European countries. They point out several issues that can be considered as sources of cross-country variation, such as differences in life expectancy, in the life-cycle wage profile, in macroprudential regulation, or in different aspects of social security nets.

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## 1. Introduction

This paper looks at how financial expectations and risk attitudes are related to household borrowing. Theoretical models in economics show that expectations about future finances are an important factor in the economic decisions of households. My study investigates whether expectations for real income matter for the borrowing behaviour of households, expanding on several previous studies that have looked at how different types of expectation affect the economic behaviour of households. Armantier et al. (2015, p. 505) find from their analysis that “most respondents act on their inflation expectations showing patterns consistent with economic theory”. Risk attitudes also influence the economic behaviour of households and this impact can be described using the utility function of households. Armantier et al. (2015) demonstrate that the effect that inflation expectations have on the actual behaviour of households is mediated by their risk attitudes.

The relationships between expectations and borrowing can be analysed theoretically through the lens of the Life-cycle/Permanent Income Hypothesis (Modigliani and Brumberg (1954), Friedman (1957)). The Life-cycle/Permanent Income Hypothesis posits that households try to hold their consumption levels stable over time at the level of their permanent income, and that they achieve that by borrowing and saving. The life-cycle model has been applied to show the theoretical relationship between optimistic expectations for income and the size of debt by Brown et al. (2005), which concludes that the relationship is positive. The theoretical relationship between risk aversion and the size of debt in Brown et al. (2013) is derived by solving the individual’s lifetime expected utility maximisation problem. The model for this with mean-variance utility concludes that this relationship depends on the values of the discounted expected returns on debt and assets, weighted by the variances and covariances.

The aim of this study is to assess whether expectations and risk attitudes provide significant additional information beyond that given by the main economic and sociodemographic characteristics of households, which can be used in predicting borrowing at a particular time period for a group of European Union countries. The research question of this paper is important because excessive borrowing and debt repayment difficulties may stem from overly optimistic expectations and a willingness to take on too much financial risk, which could even lead borrowers into a financial crisis. The assessment in my study of the relations between financial expectations, risk attitudes and household borrowing helps to account better for expectations and risk attitudes in predictions for borrowing.

The paper employs microdata from the 2010, 2014 and 2017 waves of the Eurosystem Household Finance and Consumption Survey (HFCS). Panel data fixed effects models are estimated using data on households from Belgium, Cyprus, Germany, Spain and Italy. Ten countries – Belgium, Cyprus, Germany, Estonia, Spain, France, Italy, Latvia, Poland and Slovakia – are included in the logit models that are estimated as a robustness check in the paper. Although more countries conduct the HFCS, these countries were chosen because they have a panel component in their dataset and cover the variables used in this study.

The paper contributes to multiple strands of the literature. One contribution is that while the relationships between risk attitudes and debt stock sizes have been investigated previously (e.g. Brown et al. (2013), Massó and Abalde (2020), Branten (2022), Lagomarsino and Spiganti (2023)), my paper describes new loans taken in a specific time period by employing flow variables. This study shows later that quite a large share of households change their risk attitude over time, and it may be informative to investigate the relationship between risk attitude and

borrowing decisions in a particular period of time. Another contribution is that while some studies (e.g. Brown et al. (2005)) have investigated the role that expectations play in the growth in loans, my study applies a model that uses the panel component in the dataset and finds a causal logic by taking the values of the explanatory variables from the previous survey wave to the wave from which the dependent variables are taken. The panel data fixed effects models estimated in this study make it possible to control for household time-invariant unobservable fixed effects. The questions about borrowing in my study are whether loans are applied for, and whether there is any increase in the size of the total debt, mortgage debt or non-mortgage debt.

My results show that optimistic expectations have a significant effect on increases in the outstanding mortgage debt of households, but the effect on increases in the outstanding non-mortgage debt is insignificant. The effect of expectations on loan applications is tentative, as some models imply a positive relationship while the others imply there is no significant relationship. Risk attitudes are found to be relevant for loan applications but not for increases in debt.

The paper proceeds as follows. Section 2 reviews the literature. Section 3 describes the data used in this study, with subsection 3.1 giving a general overview and subsections 3.2, 3.3 and 3.4 focusing on the core variables for this study. Section 4 describes the methods used. Section 5 presents the results. Section 6 concludes.

## **2. Literature review**

Expectations are an essential part of macroeconomic models. Armantier et al. (2015, p. 505) point out that: “Although the academic debate about expectations formation is still open, macroeconomic models are generally built on the assumption that agents maximize expected utility under a well-defined distribution representing their beliefs”. Expected utility is affected not only by expectations but also by the shape of the utility function, which reflects how risk averse households are.

Most of the previous empirical studies that use expectations or confidence as their key variables focus on how these variables affect household saving and consumption (e.g. Brown and Taylor (2006), Dees and Brinca (2013)). Relatively few studies have investigated how expectations about future finances affect the borrowing decisions of households. Kłopocka (2017) shows from data for Poland that consumer confidence indicators have predictive power for borrowing. She points out that using both economic fundamentals and subjective confidence indicators would improve forecasts of household financial behaviour. The relationship between financial expectations and both non-mortgage debt size and debt growth is investigated in Brown et al. (2005), and the relationship between financial expectations and mortgage debt size is covered in Brown et al. (2008). They conclude that both relationships are positive. A distinctive feature of my study is that the models use the panel component in the dataset, which means the values of the explanatory variables and dependent variables can be taken from different waves of the HFCS so that the explanatory variables precede the dependent variables.

There is a growing literature that is already well established on various personality characteristics as important factors affecting household borrowing and debt-related problems. The contributions of status-seeking consumption (Lee and Mori (2019)), emotions and personality (Rendall et al. (2021)) and attitudes towards debt (Pattarin and Cosma (2012), Almenberg et al. (2021), Loibl et al. (2021)) have been investigated for example. Brown and



Taylor (2014) analyse how household finances are impacted by the personality characteristics of openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. They find that the relationships are different for different types of debt and assets and that extraversion and openness to experience are the characteristics that are generally significantly related to the sizes of debt and assets.

Several studies show that attitudes towards taking financial risks are another trait of households that impacts borrowing decisions, and conclude that the relationship between risk aversion and debt size is negative (e.g. Brown et al. (2013), Branten (2022)). Lagomarsino and Spiganti (2023) find a different result and conclude that there is a positive relationship between risk aversion and debt size for Italian households. The study points out that households may use debt to protect their consumption level against negative income shocks. My study builds on the previous studies by looking at the relationship between the attitude towards risk and the increase in debt at a specific time. Several studies have shown that attitudes towards taking financial risk are relatively stable over time (e.g. Van de Venter et al. (2012)) and my study broadly supports this finding, but it also shows that about 30% of households changed their risk attitude between the second wave of the HFCS and the third wave, and this provides motivation for investigating the role of risk attitudes at a certain point in time for borrowing decisions that are taken subsequently.

This study includes several countries, and so previous studies that make cross-country comparisons of household borrowing behaviour, expectations and risk attitudes are of special interest for further analysis. Schneider et al. (2017) point out that cross-national differences in the willingness to take financial risk can to some extent be attributed to differences in personal social support networks and the social safety net of the state. Several studies have shown that national background is an important factor affecting individual risk-taking; see Schneider et al. (2017). Bover et al. (2014) and Bover et al. (2016) find from the data of the Eurosystem Household Finance and Consumption Survey that distributions of debt are heterogeneous in different European countries, and they investigate how these differences can be explained by the different legal and economic institutions in those countries. They conclude that the institution among those they study that best explains cross-country heterogeneities is how fast collateral is recovered following non-repayment of a debt. Massó and Abalde (2020) analyse the household indebtedness patterns in the Southern European countries of Spain, Italy, Portugal and Greece, and conclude that the patterns are different in these countries and that a factor which can explain these differences is the attitude to risk.

### **3. Data**

#### **3.1 General overview**

This study uses microdata from the Eurosystem Household Finance and Consumption Survey. Data from three waves of the survey in 2010, 2014 and 2017 are employed. The Eurosystem Household Finance and Consumption Survey is carried out jointly by the European Central Bank, and the national central banks and statistical institutes of the euro area countries, Hungary and Poland. The survey collects data on the non-financial assets of households and on their finances, liabilities, credit constraints, private businesses, financial assets, incomes, consumption and spending, and also records the financial expectations and attitudes, and the

sociodemographic characteristics of household members. The main results from the Eurosystem Household Finance and Consumption Survey are presented in European Central Bank (2013b), European Central Bank (2016b) and European Central Bank (2020c).

Altogether more than 62,000 households in 15 countries participated in the first wave of the survey, more than 84,000 households in 20 countries in the second wave, and more than 91,000 households in 22 countries in the third wave. The fieldwork for the first wave was carried out in 2010 and 2011 in most countries, that for the second wave was between 2013 and the first half of 2015, and that for the third wave was run in 2017. This study uses the data from countries that have a panel component, where a part of the sample of households is retained in the different waves of the survey. Twelve countries had a panel component in the 2017 wave, and they were Belgium, Cyprus, Germany, Estonia, Spain, France, Italy, Latvia, Malta, Poland, Slovakia and Finland. The number of countries in my sample is reduced because fewer countries conducted the first wave of the HFCS, and some variables in the HFCS dataset that are used in this study are missing for some countries. Panel data fixed effects models are estimated using data on households from Belgium, Cyprus, Germany, Spain and Italy. The countries included in this analysis and the time periods when the surveys were carried out in those countries are presented in Table 1.

Table 1. Time when the HFCS was conducted in the countries under observation in this study

Country	Time the survey was conducted		
	1 <sup>st</sup> wave	2 <sup>nd</sup> wave	3 <sup>rd</sup> wave
Belgium	April – October 2010	June 2014 – January 2015	January – September 2017
Cyprus	April 2010 – January 2011	February – July 2014	February – September 2017
Germany	September 2010 – July 2011	April – November 2014	March – October 2017
Estonia	-	March – June 2013	March – June 2017
Spain	November 2008 – July 2009	October 2011 – April 2012	October 2017 – May 2018
France	October 2009 – February 2010	October 2014 – February 2015	September 2017 – January 2018
Italy	January – August 2011	January – June 2015	January – September 2017
Latvia	-	April – September 2014	September – November 2017
Poland	-	January – February 2014	September – November 2016
Slovakia	September – October 2010	February – April 2014	February – April 2017

Source: Compiled by the author based on European Central Bank (2013a), European Central Bank (2016a), European Central Bank (2020b).

An important feature of the microdata from the Eurosystem Household Finance and Consumption Survey is that they are multiply imputed, meaning that missing values that could not be collected are assigned values by applying complex statistical procedures.<sup>1</sup> The dataset contains five imputed values for every missing value for the variables that are components of household wealth, consumption or income (European Central Bank (2020b)). This means that the models have to be estimated in the multiple imputation regime.

Summary statistics of the variables used in this study for the five countries as one group are shown in Table 2. Four models with different dependent variables and different numbers of observations are presented in the paper, and so Table 2 shows the ranges of means and the

<sup>1</sup> The methodology for compiling the Eurosystem Household Finance and Consumption Survey data is described more thoroughly in European Central Bank (2013a), European Central Bank (2016a) and European Central Bank (2020b).

standard deviations of variables across the observations used in the models. Table 2 and the subsequent analysis use the set of households where the age of the reference person under the Canberra definition<sup>2</sup> is between 20 and 64 in the 2014 wave. A description of the variables is given in Appendix 1. The main variables are those for expectations and risk attitudes and the variables describing borrowing, and they are described more thoroughly in subsections 3.2, 3.3 and 3.4. These subsections also show the heterogeneities between the different countries.

Table 2. Summary statistics of the variables

Variable	Mean <sup>a</sup>	Standard deviation <sup>a</sup>	Number of observations
<i>Borrowing-related variables</i>			
Applied (t)	0.24–0.28	0.43–0.45	3,553–3,726
Debt increased ((t-1)–(t)) <sup>b</sup>	0.60–0.63	0.48–0.49	2,460–2,476
Mortgage debt increased ((t-1) –(t)) <sup>b</sup>	0.60–0.68	0.47–0.49	1,659–1,660
Non-mortgage debt increased ((t-1)–(t)) <sup>b</sup>	0.54–0.55	0.50	1,725–1,735
<i>Variables of expectations and risk attitudes</i>			
Risk averse (t-1)	0.57–0.64	0.48–0.50	1,659–3,726
Positive expectation (t-1)	0.16–0.24	0.37–0.42	1,659–3,726
<i>Economic and sociodemographic characteristics</i>			
1st income quintile (t-1)	0.03–0.13	0.18–0.33	1,659–3,726
2nd income quintile (t-1)	0.08–0.19	0.26–0.39	1,659–3,726
3rd income quintile (t-1)	0.19–0.25	0.39–0.43	1,659–3,726
4th income quintile (t-1)	0.24–0.29	0.43–0.45	1,659–3,726
5th income quintile (t-1)	0.21–0.41	0.41–0.49	1,659–3,726
Age 20–34 years (t-1)	0.10–0.24	0.30–0.43	1,659–3,726
Age 35–49 years (t-1)	0.42–0.53	0.49–0.50	1,659–3,726
Age 50–64 years (t-1)	0.30–0.45	0.46–0.50	1,659–3,726
Second stage of basic education or below (t-1)	0.15–0.24	0.36–0.43	1,659–3,726
Upper secondary or post-secondary education (t-1)	0.40–0.51	0.49–0.50	1,659–3,726
Tertiary education (t-1)	0.25–0.45	0.43–0.50	1,659–3,726
Employee (t-1)	0.72–0.80	0.40–0.45	1,659–3,726
Self-employed (t-1)	0.12–0.15	0.32–0.36	1,659–3,726
Unemployed (t-1)	0.03–0.08	0.18–0.27	1,659–3,726
Inactive (t-1)	0.03–0.09	0.17–0.29	1,659–3,726
Household size (t-1)	2.66–2.93	1.29–1.33	1,659–3,726
Number of household members in employment (t-1)	1.40–1.66	0.72–0.80	1,659–3,726
Home owner (t-1)	0.55–0.89	0.31–0.50	1,659–3,726
Has vehicles (t-1)	0.82–0.95	0.23–0.39	1,659–3,726
Has debt (t-1)	0.55–0.60	0.49–0.50	3,553–3,726

Notes.

<sup>a</sup> Calculated using the survey weights for households.

<sup>b</sup> Calculated only for households holding a loan liability in the t-1 or t survey wave.

Sources: Eurosystem Household Finance and Consumption Survey; author's compilation and calculations.

<sup>2</sup> The principles for selecting the reference person according to the Canberra Group definition are provided in UNECE (2011).

The unit of analysis is the household. The number of observations in Table 2 and Table A2 is the number of households, but the number of observations in Table 6 and Table 7 is the number of households multiplied by the number of time points for them. Borrowing-related variables, variables for expectations and risk attitudes, and some control variables are measured in the survey at the household level. The variables for age, education and employment status are measured in the survey at the level of the household members. For my analysis, I have selected the Canberra definition reference person to represent the household for the individual-level variables.

### 3.2 Expectations

The expectations of households are measured in this study by the question in the HFCS questionnaire of whether the household expects its total income to go up by more than prices, less than prices or about the same amount as prices over the next year. Three dummy variables are defined from this question, one of which takes the value 1 if the household expects its income to go up by more than prices, one that does so if the household expects its income to go up by about the same amount as prices, and one that is for if it expects its income to go up by less than prices. The models estimated use the dummy variable for the household expecting its income to go up by more than prices.

Table 3 shows the share of households that expected that their income would rise by more than prices, and the share of households whose assessment of whether their real income would grow, stay the same or decline was the same in the different waves of the HFCS. It shows there are large cross-country differences in the share of households expecting their income to increase by more than prices in the second wave of the survey. This share varies between the ten countries in this study from about 3% in Cyprus to 43% in Italy.

Table 3. Expectations of households for real income in different countries

Country	Share of households expecting their income to rise more than prices over the next year (2014)	Share of households whose real income expectation remained the same in the 2 <sup>nd</sup> and 3 <sup>rd</sup> waves	Share of households whose real income expectation remained the same in the 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> waves
Belgium	0.08	0.53	0.28
Cyprus	0.03	0.47	0.21
Germany	0.11	0.55	0.20
Estonia	0.08	0.53	-
Spain	0.29	0.49	0.25
France	0.17	0.46	-
Italy	0.43	0.34	0.22
Latvia	0.12	0.54	-
Poland	0.04	0.59	-
Slovakia	0.04	0.61	-

Note. Shares are calculated using the survey weights for households.

Sources: Eurosystem Household Finance and Consumption Survey; author's compilation and calculations.

An interesting question is how much the expectations are affected by personality characteristics and cultural aspects and how much they are shaped by the current economic

situation. GDP and compensation of employees fell in Cyprus during the period when the second wave of the HFCS was conducted there. The compensation of employees was growing in Italy, albeit at a moderate rate, but consumer prices were stable or falling in some months. It can be seen from Table 3 that the share of households whose real income expectations remained the same in the different survey waves is smaller for countries where the share of households with optimistic expectations was relatively small in the second wave, like Cyprus, or where it was large like Italy, Spain, France.

### 3.3 Risk attitudes

The risk attitudes of households are measured by the question in the HFCS questionnaire: “Which of the following statements comes closest to describing the amount of financial risk that you (and your husband/wife/partner) are willing to take when you save or make investments?”. The options for answers are that the respondent a) is willing to take substantial financial risks expecting to earn substantial returns; b) is willing to take above average financial risks expecting to earn above average returns; c) is willing to take average financial risks expecting to earn average returns; or d) is not willing to take any financial risk. Three variables are defined from this question. The first is a dummy variable taking the value 1 if the household is not willing to take any financial risk, the second is a dummy variable taking the value 1 if the household is willing to take substantial or above average financial risks<sup>3</sup>, and the third is a dummy variable taking the value 1 if the household is willing to take average financial risks. In the models estimated, the dummy variable for the household not being willing to take any financial risk is used.

Table 4. Risk attitudes of households in different countries

Country	Share of risk averse households (2014)	Share of households willing to take above average financial risks (2014)	Share of households whose risk attitude remained the same in the 2 <sup>nd</sup> and 3 <sup>rd</sup> waves	Share of households whose risk attitude remained the same in the 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> waves
Belgium	0.70	0.06	0.73	0.53
Cyprus	0.85	0.05	0.69	0.45
Germany	0.62	0.04	0.68	0.49
Estonia	0.68	0.08	0.66	-
Spain	0.85	0.02	0.80	0.70
France	0.83	0.03	0.77	-
Italy	0.51	0.14	0.53	0.26
Latvia	0.87	0.04	0.81	-
Poland	0.89	0.02	0.77	-
Slovakia	0.77	0.05	0.77	-

Notes. Shares are calculated using the survey weights for households. The share of households willing to take above average financial risks also includes households willing to take substantial financial risks.

Sources: Eurosystem Household Finance and Consumption Survey; author’s compilation and calculations.

Table 4 shows the share of households unwilling to take on any financial risk, the share of households willing to take substantial or above average financial risks and the share of

<sup>3</sup> The two groups are summed here, because there are few households in these categories.

households whose assessment of their risk attitude in one of the four categories remained the same in the different waves of the HFCS. Comparing the cross-country heterogeneity in risk attitudes to the cross-country heterogeneity in expectations shows there is less variation in risk attitudes. The share of households with the same risk attitude in different survey waves is higher than it was for real income expectations, with as many as 70% of households in Spain holding the same risk attitude in the first, second and third waves. This indicates that risk attitudes are more stable than expectations, which appear to fluctuate more.

### 3.4 Borrowing variables

Four variables related to borrowing are considered in this subsection. The first is a dummy that takes the value 1 if the household had applied for credit within the past three years in the 2017 survey wave; the second is a dummy that takes the value 1 if the debt of the household increased in size between the second and third waves of the HFCS; the third is a dummy that takes the value 1 if the mortgage debt of the household increased in size between the second and third waves of the HFCS; and the fourth is a dummy that takes the value 1 if the non-mortgage debt of the household increased in size between the second and third waves of the HFCS. It should be noted that the last three variables are defined only for households that had a loan liability in the second or third wave of the survey.

The second, third and fourth variables take account of a proxy for the amortisation of loans that is calculated in this study from the variables in the HFCS dataset for the amount initially borrowed and the initial maturity of loans.<sup>4</sup> The proxy for the monthly principal payment of loans is multiplied by the number of months between the second and the third waves of the HFCS. The number of months is different for different countries, and this figure is found for each country from the middle month that the second wave of the HFCS was carried out to the middle month of the third wave of the HFCS.<sup>5</sup> A lack of data means that amortisation cannot be calculated for all loans and the value 0 is given to the proxy for amortisation in these cases.<sup>6</sup>

Table 5 shows the share of households that had applied for credit within the last three years in the third wave, and the share of households that increased their total debt, mortgage debt or non-mortgage debt over the period between the second and third waves of the HFCS. Large cross-country differences are evident for all of these variables.

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<sup>4</sup> The proxy for amortisation was also estimated in alternative ways and the main results were broadly the same when alternative proxies for amortisation were used.

<sup>5</sup> As can be seen from Table 1, each wave of the HFCS was carried out over several months in all of the countries.

<sup>6</sup> Amortisation was considered zero for about 14% of the households that held loan liabilities in the second survey wave. There were some households in that category in all the countries covered in the analysis.

Table 5. Variables related to borrowing for households in different countries

Country	Share of households that had applied for credit within the last three years (2017)	Share of households whose total debt increased in size from the second wave to the third <sup>a</sup>	Share of households whose mortgage debt increased in size from the second wave to the third <sup>a</sup>	Share of households whose non-mortgage debt increased in size from the second wave to the third <sup>a</sup>
Belgium	0.26	0.58	0.62	0.50
Cyprus	0.10	0.51	0.46	0.48
Germany	0.32	0.61	0.64	0.53
Estonia	0.30	0.70	0.53	0.78
Spain	0.35	0.77	0.74	0.78
France	0.41	0.58	0.55	0.56
Italy	0.15	0.48	0.40	0.50
Latvia	0.25	0.66	0.54	0.65
Poland	0.10	0.56	0.46	0.59
Slovakia	0.15	0.52	0.59	0.42

Notes. Figures are calculated using the survey weights for households.

<sup>a</sup>Calculated only for households that held debt in the 2014 or 2017 survey waves.

Sources: Eurosystem Household Finance and Consumption Survey; author's compilation and calculations.

## 4. Method

The main method used is panel data modelling, in which panel data fixed effects logit models and panel data linear probability fixed effects models are estimated. The economic and sociodemographic variables for age, income, education, labour market status, and household size that are in the set of variables are also used in several earlier studies (e.g. Brown et al. (2005), Brown et al. (2013)), but the other variables in the set differ in some aspects since the set of variables available in the HFCS is different to that used in other studies. The variables describing the risk attitudes are the same as those used in Massó and Abalde (2020), but my study has different research questions. The research questions analysed and the set of variables and the method used in this paper are closest to those in Branten (2022). Logit models have been widely used in the literature to investigate various phenomena related to debt (e.g. Bover et al. (2014), Bover et al. (2016), Du Caju et al. (2016), Pattarin and Cosma (2012)).

Panel data logit models are estimated with fixed effects. A Hausman test performed separately on each implicate in the dataset suggested that fixed effects models should be used instead of random effects models. The fixed effects models that are estimated can be described by the following equation:

$$\text{Equation (1): Probability}(DI_{((t-1)-(t))i} = 1) = F(\beta_1 + \beta_2 EXPpos_{(t-1)i} + \beta_3 RAneg_{(t-1)i} + \sum_{s=1}^S \delta_s x_{(t-1)is} + \mu_i + u_{it})$$

where  $DI_{((t-1)-(t))i}$  is the variable “Debt increased”, “Mortgage debt increased” or “Non-mortgage debt increased” for household  $i$  as described in Table 2 and Appendix 1,  $EXPpos_{(t-1)i}$  is the variable “Positive expectation” for household  $i$ ,  $RAneg_{(t-1)i}$  is the variable “Risk averse” for household  $i$ ,  $x_{(t-1)i1}, x_{(t-1)i2}, \dots, x_{(t-1)is}$  are the control variables for household  $i$ ,  $\beta_1, \beta_2, \beta_3, \delta_1, \delta_2, \dots, \delta_s$  are the parameters,  $\mu_i$  is the time-invariant household fixed

effect, and  $u_{it}$  is the error term of the model.  $F(\cdot)$  is the cumulative logistic distribution function.  $t - 1$  and  $t$  denote the survey waves 2010 and 2014, or 2014 and 2017.

The model predicting the application for credit is similar to Equation (1) but with the dependent variable “Applied” and with one more control variable included.

In addition to the panel data fixed effects logit models, panel data linear probability fixed effects models are also estimated in the paper. Linear probability models are easy to estimate and interpret, but they have the drawback that the probabilities predicted by the model can be smaller than 0 or larger than 1. The probabilities predicted by the logit models are within the range of 0 to 1. The results presented in the paper from the logit models estimated are average marginal effects, because these have an understandable interpretation. Angrist and Pischke (2009) suggest that marginal effects from limited dependent variable models and those from linear probability models are often fairly similar.

The panel data models let me test whether the relationships between expectations, risk attitudes and borrowing are significant if a longer time period covering different phases of the economic cycle and unobserved household fixed effects is considered. Panel data models are estimated for the households that participated in all three waves of the HFCS in 2010, 2014 and 2017. There are five countries for which the panel component for the three waves of the HFCS and the variables needed for my models are present, and they are Belgium, Cyprus, Germany, Spain and Italy. Replicate weights could not be used for calculating standard errors in the panel data models.

As a robustness check, cross-sectional logit models are estimated for a larger sample of ten European Union countries. The values for the explanatory variables are taken from the data for the second wave of the HFCS, while the values for the dependent variables are taken from the data for the third wave or defined as the change between the values of the variables in the second and third waves. The larger sample has the benefit of being able to attain more precise estimates in regressions. However, cross-sectional models lack the ability to capture household time-invariant unobservable fixed effects.

## 5. Results

Table 6 presents the results of the panel fixed effects logit models estimated, where the dependent variables are a dummy taking the value 1 if the household had applied for credit within the past three years in survey wave  $t$ , a dummy taking the value 1 if the household increased its debt over the period from the  $t - 1$  wave to the  $t$  wave, a dummy taking the value 1 if the household increased its mortgage debt, and a dummy taking the value 1 if the household increased its non-mortgage debt. The share of such households was about 0.28, 0.63, 0.68 and 0.55 respectively if  $t$  is the 2017 wave, and about 0.24, 0.60, 0.60 and 0.54 respectively if  $t$  is the 2014 wave.

Model (1) has the dependent variable for whether credit was applied for within the past three years from survey wave  $t$ . The explanatory variables are from the survey wave  $t - 1$ . As can be seen from model (1), risk aversion is negatively related to loan applications, as the probability of risk averse households applying for loans is about 3 percentage points lower than the probability for other households. This effect is also very similar in the linear probability fixed effects model that is estimated and shown in Table 7 as model 1. This average marginal



effect on credit applications is smaller than the effects of owning a home and having debt, but is relatively large next to the baseline probability of applying for credit.

Optimistic expectations for real income are not found to be significant at the 10% significance level in the fixed effects logit model, but they are significant in the linear probability fixed effects model (model (1) in Table 7). The conclusion from this may be that positive expectations for real income are related to loan applications but their statistical significance is not very strong. Model (1) in Table 7 implies that the probability of households with optimistic expectations applying for a loan is about 2.9 percentage points higher than that for other households.

It can be seen from model (3) in Table 6 that positive expectations for real income are relevant for predicting whether the mortgage debt increased in size over the period from the  $t - 1$  wave to the  $t$  wave, and the relationship is positive. The average marginal effect is statistically insignificant for non-mortgage loans (see model (4) in Table 6).

The share of households holding a loan liability in the second or third wave of the survey that increased their mortgage debt over the period from the second wave to the third was about 0.68. The fixed effects logit model suggests that the probability of households with positive expectations for real income increasing their mortgage debt over the period from the  $t - 1$  wave to the  $t$  wave was about 12.3 percentage points higher than that for other households. This average marginal effect is less than the effect on the increase in debt of the age of the household's reference person.

The results of model (3) in Table 6 and Table 7 show that households with a younger reference person increased their mortgage debt more often, and households that were already owners of their main residence in the  $t - 1$  wave of the HFCS increased their mortgage debt less often. These results are intuitive. As may be noted from Table 6 and Table 7, attitudes to risk do not provide any additional relevant information beyond that from the main economic and sociodemographic characteristics in predicting increases in household debt in the dataset of the five EU countries.

Appendix 2 presents the cross-sectional logit models estimated on a larger sample as a robustness check. The main results of the panel data models broadly hold. Positive associations are found between optimistic expectations and loan applications, and optimistic expectations and increases in mortgage debt. However, risk aversion is not found to be significant in any of the cross-sectional models.

Table 6. Estimates from fixed effects logit models for predicting whether credit was applied for (wave  $t$ ; model (1)), total debt increased (from wave  $t - 1$  to  $t$ ; model (2)), mortgage debt increased (from wave  $t - 1$  to  $t$ , model (3)), or non-mortgage debt increased (from wave  $t - 1$  to  $t$ , model (4))

Explanatory variables	Applied (1)	Debt increased (2)	Mortgage debt increased (3)	Non-mortgage debt increased (4)
Positive real income expectation ( $t - 1$ )	0.0276 (0.0209)	0.0396 (0.0282)	0.123*** (0.0440)	-0.0412 (0.0354)
Risk averse ( $t - 1$ )	-0.0300* (0.0179)	-0.00824 (0.0260)	-0.0158 (0.0289)	-0.0132 (0.0294)
<i>Income quintile (reference group: 1<sup>st</sup> quintile) (<math>t - 1</math>)</i>				
2 <sup>nd</sup> quintile	-0.00582 (0.0306)	-0.00759 (0.0527)	-0.0746 (0.0763)	0.0635 (0.0573)
3 <sup>rd</sup> quintile	0.000888 (0.0329)	0.0415 (0.0567)	-0.0434 (0.0782)	0.0151 (0.0631)
4 <sup>th</sup> quintile	-0.0215 (0.0318)	0.00246 (0.0589)	-0.0727 (0.0776)	0.0122 (0.0671)
5 <sup>th</sup> quintile	0.00586 (0.0372)	-0.0366 (0.0615)	-0.107 (0.0788)	-0.0190 (0.0725)
<i>Age (reference group: 50–64 years) (<math>t - 1</math>)</i>				
20-34 years	-0.0508 (0.0334)	0.0479 (0.0705)	0.232** (0.100)	0.177** (0.0717)
35-49 years	-0.0342 (0.0237)	-0.0138 (0.0390)	0.0647 (0.0488)	0.0703 (0.0463)
<i>Education level (reference group: second stage of basic education or below) (<math>t - 1</math>)</i>				
Upper secondary or post-secondary	-0.00566 (0.0266)	0.0295 (0.0561)	0.0762 (0.0708)	0.0138 (0.0617)
Tertiary	0.0502 (0.0464)	0.0650 (0.0669)	0.173* (0.0978)	-0.0112 (0.0756)
<i>Labour market status (reference group: inactive) (<math>t - 1</math>)</i>				
Employee	-0.0899* (0.0475)	-0.0173 (0.0612)	-0.0203 (0.0776)	0.0430 (0.0744)
Self-employed	-0.0937* (0.0539)	0.0116 (0.0744)	-0.00301 (0.0930)	0.0809 (0.0838)
Unemployed	-0.0965* (0.0520)	0.0685 (0.0749)	0.0336 (0.102)	0.122 (0.0800)
Household size ( $t - 1$ )	-0.00710 (0.0111)	0.00166 (0.0202)	0.00348 (0.0233)	-0.0184 (0.0238)
Number of household members in employment ( $t - 1$ )	0.0180 (0.0142)	0.00205 (0.0231)	0.00570 (0.0259)	0.0144 (0.0273)
Home owner ( $t - 1$ )	-0.118** (0.0520)	-0.182*** (0.0594)	-0.403*** (0.0867)	0.0325 (0.0608)
Has vehicles ( $t - 1$ )	0.00211 (0.0339)	0.0784 (0.0556)	0.0952 (0.0799)	0.0104 (0.0624)
Has debt ( $t - 1$ )	-0.0932** (0.0366)			
Number of observations	1,836	2,374	1,462	1,726
Number of households	918	1,187	731	863

Notes. Average marginal effects of the variables. Standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% levels respectively.

Sources: Eurosystem Household Finance and Consumption Survey; author's calculations.

Table 7. Estimates from linear probability fixed effects models for predicting whether credit was applied for (wave  $t$ ; model (1)), total debt increased (from wave  $t - 1$  to  $t$ ; model (2)), mortgage debt increased (from wave  $t - 1$  to  $t$ , model (3)), or non-mortgage debt increased (from wave  $t - 1$  to  $t$ , model (4))

Explanatory variables	Applied (1)	Debt increased (2)	Mortgage debt increased (3)	Non-mortgage debt increased (4)
Positive real income expectation ( $t - 1$ )	0.0289* (0.0170)	0.0493 (0.0329)	0.140*** (0.0392)	-0.0538 (0.0473)
Risk averse ( $t - 1$ )	-0.0295* (0.0155)	-0.0129 (0.0291)	-0.0148 (0.0347)	-0.0151 (0.0395)
<i>Income quintile (reference group: 1<sup>st</sup> quintile) (<math>t - 1</math>)</i>				
2 <sup>nd</sup> quintile	8.81e-05 (0.0319)	-0.0175 (0.0609)	-0.0860 (0.0820)	0.0914 (0.0821)
3 <sup>rd</sup> quintile	0.0108 (0.0334)	0.0394 (0.0632)	-0.0477 (0.0818)	0.0251 (0.0851)
4 <sup>th</sup> quintile	-0.0169 (0.0350)	0.00430 (0.0656)	-0.0603 (0.0821)	0.0187 (0.0907)
5 <sup>th</sup> quintile	0.00697 (0.0382)	-0.0438 (0.0702)	-0.101 (0.0857)	-0.0241 (0.0984)
<i>Age (reference group: 50–64 years) (<math>t - 1</math>)</i>				
20-34 years	-0.0417 (0.0423)	0.0291 (0.0736)	0.201** (0.0845)	0.221** (0.103)
35-49 years	-0.0346 (0.0239)	-0.0190 (0.0450)	0.0672 (0.0526)	0.0877 (0.0612)
<i>Education level (reference group: second stage of basic education or below) (<math>t - 1</math>)</i>				
Upper secondary or post-secondary	-0.0102 (0.0337)	0.0306 (0.0608)	0.0927 (0.0741)	0.0217 (0.0813)
Tertiary	0.0494 (0.0406)	0.0708 (0.0725)	0.179** (0.0851)	-0.00826 (0.0991)
<i>Labour market status (reference group: inactive) (<math>t - 1</math>)</i>				
Employee	-0.0515 (0.0345)	-0.0186 (0.0744)	-0.0268 (0.100)	0.0579 (0.0984)
Self-employed	-0.0479 (0.0433)	0.0209 (0.0880)	0.000894 (0.113)	0.102 (0.118)
Unemployed	-0.0585 (0.0415)	0.0770 (0.0857)	0.0122 (0.116)	0.161 (0.113)
Household size ( $t - 1$ )	-0.00582 (0.0129)	0.00393 (0.0232)	0.00356 (0.0266)	-0.0210 (0.0318)
Number of household members in employment ( $t - 1$ )	0.0250* (0.0148)	0.000107 (0.0272)	0.00720 (0.0322)	0.0227 (0.0379)
Home owner ( $t - 1$ )	-0.130*** (0.0345)	-0.202*** (0.0638)	-0.364*** (0.0728)	0.0367 (0.0896)
Has vehicles ( $t - 1$ )	0.00390 (0.0333)	0.0893 (0.0644)	0.100 (0.0852)	0.00270 (0.0847)
Has debt ( $t - 1$ )	-0.0929*** (0.0182)			
Constant	0.412*** (0.0692)	0.636*** (0.138)	0.719*** (0.184)	0.400** (0.182)

<b>Explanatory variables</b>	<b>Applied (1)</b>	<b>Debt increased (2)</b>	<b>Mortgage debt increased (3)</b>	<b>Non-mortgage debt increased (4)</b>
Number of observations	7,279	4,936	3,319	3,460
Number of households	3,777	2,799	1,903	2,146

Notes. Coefficients of the variables. Standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% levels respectively.

Sources: Eurosystem Household Finance and Consumption Survey; author's calculations.

## 6. Conclusion and discussion

My study has shown that positive expectations for real income have quite a large effect on increases in outstanding mortgage debt, while the effect on increases in non-mortgage debt is insignificant. This is intuitive since mortgage loans are large liabilities and the decision to buy property can often be postponed in the face of financial difficulties. Non-mortgage loans are often smaller and may be needed urgently.

The result of this study that optimistic expectations about future finances are related to an increase in the size of mortgage debt merits deeper analysis by further studies for different countries separately. Hintermaier and Koeniger (2016) present a framework for analysing the home-equity positions in different European countries. They point out several issues that can be considered as sources of cross-country variation, such as differences in life expectancy, in the life-cycle wage profile, in social security nets, or in macroprudential and fiscal policy. Poppe et al. (2016) use the focus group method to investigate different aspects of the valuation of homeownership and how this affects the uptake of mortgage loans in the UK, Norway and Denmark. They find that monetary values, especially the idea of owner-occupation as an investment, play an important role in how homeownership is perceived in all three countries.

This study has shown that a household's attitude to risk is significantly related to whether it applies for a loan, but does not provide information for predicting increases in loans. It may be concluded from the previous literature (e.g. Brown et al. (2013), Branten (2022)) that risk attitudes matter for the total amount of debt taken on by a household, but not so much for the change in liabilities in a given period of time.

Finally, some ideas for further research can be noted. The 2017 wave of the Eurosystem Household Finance and Consumption Survey included questions on expectations about future house prices and the estimated likelihood of losing a job. These expectations could also be used for analysis if more waves of the Household Finance and Consumption Survey are carried out. The assessment by households of the value of their residence is found by Camões and Vale (2020) to be significant in explaining household indebtedness, for example. Moreover, the non-core variables of the Household Finance and Consumption Survey may provide information on several interesting aspects that could be analysed. One of these is whether there are differences in the effects on borrowing behaviour of the expectations that households have about their own finances and of their expectations about the general economic climate.

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## Appendix 1. Description of variables

Table A1. Description of the variables used in the study

Variable	Description of the variable
Applied (t)	Household has applied for credit within the last three years in the t wave of HFCS (1=yes, 0=no)
Debt increased ((t-1)-(t))	Outstanding balance of liabilities of the household has increased from the t-1 wave to the t wave of HFCS, taking the proxy for amortisation of loans into account (1=yes, 0=no). Variable is defined only for households that held debt in the t-1 or t wave of the HFCS.
Mortgage debt increased ((t-1)-(t))	Outstanding balance of mortgage debt of the household has increased from the t-1 wave to the t wave of HFCS, taking the proxy for amortisation of loans into account (1=yes, 0=no). Variable is defined only for households that held mortgage debt in the t-1 or t wave of the HFCS.
Non-mortgage debt increased ((t-1)-(t))	Outstanding balance of non-mortgage debt of the household has increased from the t-1 wave to the t wave of HFCS, taking the proxy for amortisation of loans into account (1=yes, 0=no). Variable is defined only for households that held non-mortgage debt in the t-1 or t wave of the HFCS.
Risk averse (t-1)	Household is not willing to take any financial risk in the t-1 wave of the HFCS (1=yes, 0=no).
Positive expectation (t-1)	Household expects its total income to go up more than prices over the next year in the t-1 wave of the HFCS (1=yes, 0=no).
1st income quintile (t-1)	Household's annual income is in the first income quintile in the t-1 wave of the HFCS; based on the original sample (1=yes, 0=no).
2nd income quintile (t-1)	Household's annual income is in the second income quintile in the t-1 wave of the HFCS; based on the original sample (1=yes, 0=no).
3rd income quintile (t-1)	Household's annual income is in the third income quintile in the t-1 wave of the HFCS; based on the original sample (1=yes, 0=no).
4th income quintile (t-1)	Household's annual income is in the fourth income quintile in the t-1 wave of the HFCS; based on the original sample (1=yes, 0=no).
5th income quintile (t-1)	Household's annual income is in the fifth income quintile in the t-1 wave of the HFCS; based on the original sample (1=yes, 0=no).
Age 20–34 years (t-1)	Household's reference person's age is between 20 and 34 years in the t-1 wave of the HFCS (1=yes, 0=no).
Age 35–49 years (t-1)	Household's reference person's age is between 35 and 49 years in the t-1 wave of the HFCS (1=yes, 0=no).
Age 50–64 years (t-1)	Household's reference person's age is between 50 and 64 years in the t-1 wave of the HFCS (1=yes, 0=no).
Second stage of basic education or below (t-1)	Highest completed education of the reference person of the household in the t-1 wave of the HFCS is second stage of basic education or below (1=yes, 0=no).
Upper secondary or post-secondary education (t-1)	Highest completed education of the reference person of the household in the t-1 wave of the HFCS is upper secondary or post-secondary education (1=yes, 0=no).
Tertiary education (t-1)	Highest completed education of the reference person of the household in the t-1 wave of the HFCS is tertiary education (1=yes, 0=no).
Employee (t-1)	The reference person of the household is an employee in the t-1 wave of the HFCS (1=yes, 0=no).
Self-employed (t-1)	The reference person of the household is self-employed in the t-1 wave of the HFCS (1=yes, 0=no).
Unemployed (t-1)	The reference person of the household is unemployed in the t-1 wave of the HFCS (1=yes, 0=no).



<b>Variable</b>	<b>Description of the variable</b>
Inactive (t-1)	The reference person of the household is inactive in the labour market in the t-1 wave of the HFCS (1=yes, 0=no).
Household size (t-1)	Number of members in the household in the t-1 wave of the HFCS.
Number of household members in employment (t-1)	Number of household members in employment in the t-1 wave of the HFCS.
Home owner (t-1)	Household owns its main residence in the t-1 wave of the HFCS (1=yes, 0=no).
Has vehicles (t-1)	Household has vehicles in the t-1 wave of the HFCS (1=yes, 0=no).
Has debt (t-1)	Household has debt in the t-1 wave of the HFCS (1=yes, 0=no).

Sources: Author's compilation based on European Central Bank (2020a); European Central Bank (2021).

## Appendix 2. Estimated cross-sectional logit models

Table A2. Estimated logit models for predicting whether credit was applied for (2017, model (1)), total debt increased (2014–2017; model (2)), mortgage debt increased (2014–2017, model (3)), or non-mortgage debt increased (2014–2017, model (4))

Explanatory variables	Applied (1)	Debt increased (2)	Mortgage debt increased (3)	Non-mortgage debt increased (4)
Positive real income expectation (2014)	0.0289* (0.0165)	0.0472** (0.0229)	0.0616** (0.0287)	0.0267 (0.0273)
Risk averse (2014)	-0.00793 (0.0147)	0.0103 (0.0219)	0.00570 (0.0281)	0.00712 (0.0242)
<i>Income quintile (reference group: 1<sup>st</sup> quintile) (2014)</i>				
2 <sup>nd</sup> quintile	0.0450* (0.0258)	0.0677 (0.0431)	0.0366 (0.0634)	0.0325 (0.0457)
3 <sup>rd</sup> quintile	0.0666*** (0.0238)	0.0600 (0.0403)	0.0290 (0.0574)	0.0149 (0.0430)
4 <sup>th</sup> quintile	0.0607** (0.0253)	0.0444 (0.0438)	0.0319 (0.0581)	0.00688 (0.0475)
5 <sup>th</sup> quintile	0.0698*** (0.0248)	0.0395 (0.0433)	0.0284 (0.0582)	0.0206 (0.0469)
<i>Age (reference group: 50-64 years) (2014)</i>				
20-34 years	0.138*** (0.0204)	0.0821*** (0.0273)	0.148*** (0.0356)	0.0462 (0.0313)
35-49 years	0.0518*** (0.0141)	0.0465** (0.0212)	0.0726** (0.0287)	0.0300 (0.0234)
<i>Education level (reference group: second stage of basic education or below) (2014)</i>				
Upper secondary or post-secondary	-0.0152 (0.0181)	-0.0140 (0.0270)	-0.00155 (0.0361)	-0.0179 (0.0295)
Tertiary	-0.0185 (0.0186)	-0.00749 (0.0276)	0.00165 (0.0362)	-0.0230 (0.0307)
<i>Labour market status (reference group: inactive) (2014)</i>				
Employee	0.0166 (0.0227)	-0.0104 (0.0342)	0.0247 (0.0525)	0.00190 (0.0401)
Self-employed	0.0242 (0.0261)	-0.0472 (0.0426)	-0.0416 (0.0608)	-0.00438 (0.0480)
Unemployed	-0.00616 (0.0312)	-0.00826 (0.0429)	-0.00292 (0.0686)	-0.00308 (0.0520)
Household size (2014)	0.00796 (0.00526)	0.00357 (0.00762)	0.000596 (0.0104)	-0.000220 (0.00883)
Number of household members in employment (2014)	0.0260** (0.0114)	0.0171 (0.0152)	0.00204 (0.0212)	0.00871 (0.0192)
Home owner (2014)	-0.0209 (0.0164)	-0.0424* (0.0230)	-0.182*** (0.0385)	-0.00581 (0.0266)
Has vehicles (2014)	0.0204 (0.0226)	-0.00182 (0.0303)	0.00429 (0.0458)	0.00977 (0.0342)
Has debt (2014)	0.172*** (0.0133)			
Number of observations	14,684	9,753	6,068	7,297
Pseudo R <sup>2</sup>	0.132	0.030	0.049	0.039

Notes. Average marginal effects of the variables. Standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% levels respectively. Models also include country dummies, the effects of which are not reported. Values of Pseudo

$R^2$  are calculated for each implicate separately and the minimal values across implicates are reported (a similar approach was used in Kukk (2017)).

Sources: Eurosystem Household Finance and Consumption Survey; author's calculations.

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