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Know more, spend more?

The impact of financial literacy on household consumption

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Abstract

This paper examines the relationship between household consumption and financial literacy for Dutch households. The economic framework is a simple life-cycle model of consumption in which financial literacy affects the rate of return on assets. The theoretical predictions are that financial literacy and consumption levels are positively correlated for plausible values of the intertemporal elasticity of substitution and that financial literacy and consumption growth are positively correlated. We use Dutch data from the LISS household panel to empirically test our theoretical predictions. Our results provide evidence for a strong positive association between couples' non-durable consumption and the level of the male partner's financial literacy. We did not find evidence for an association between consumption growth and financial literacy. Our results are robust to including household assets, interest in financial literacy and to examining different stages of the life-cycle.

Keywords: life-cycle model, financial literacy, self-assessed financial literacy, household consumption

JEL codes: D14, D91, G11, E21

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1. Introduction

Saving behaviour is a means to smooth consumption and if accumulated savings are invested wisely, it increases lifetime consumption. Understanding household saving and consumption decisions is important for the current discussion on the general lack of interest in dealing with pensions and not always making wise and timely investment decisions. Procrastination may be responsible for people to postpone saving for retirement: They value present consumption more than future consumption leading— without intervention— to lower accumulated funds than predicted by the standard life-cycle model. See Laibson (1997) for a theoretical analysis of the decision-making process of hyperbolic discounting consumers. Krijnen, Breugelmans & Zeelenberg (2014) discuss the issues around postponing retirement planning in the Netherlands and conclude that many people do not recognise why they should save now and how they should do so. The consequences of postponing planning for retirement can be that a household enters retirement with too few financial means to satisfy consumption needs. In a paper exploring whether the Dutch can meet their own retirement expenditure goals, de Bresser and Knoef (2015) find that for 20% of households the expected financial situation at age 65 falls short of minimum expenditures.

Thaler and Benartzi (2004) recognise that procrastinating agents do not act as predicted by standard life-cycle theory and propose a savings program called Save More Tomorrow™ in which people commit in advance to allocate a share of their future salary increases to retirement savings. A programme as designed by Thaler and Benartzi could be an effective approach but probably brings along substantial implementation costs. A different and arguably less paternalistic approach could be to stimulate individuals to become more active financial planners by increasing their financial knowledge which, in turn, may as well increase their confidence in making sound financial decisions, with the aim to exploit better returns on investment. O'Donoghue & Rabin (1999) argue that usually, if an action involves immediate costs and future benefits, people procrastinate. However, if a person is (financially) sophisticated, then "[he or she] does the activity sooner than does a naiver person with the same preferences" (p.104). Planning for retirement can undoubtedly be regarded as an action involving current costs and future benefits.

There already are several studies confirming that more sophisticated, more financially literate people are more likely to engage in financial planning (Lusardi & Mitchell, 2007b, 2011; van Rooij, Lusardi, & Alessie, 2011a). In its basic form, financial literacy "relates to a person's competency to manage money" (Remund, 2010, p. 279). Remund (2010) offers a

synthesised conceptual definition[1] that combines multiple dimensions in order to create a holistic image of what financial literacy is. Financial literacy is not only about knowledge of financial concepts but comprises also the ability to use that knowledge for financial planning. The classical approach to measure financial literacy in the economic literature has been developed by Lusardi and Mitchell (2007a) and is made up of questions essentially testing numeracy and the knowledge of (basic) financial concepts such as interest compounding, inflation, investing in stocks and the relationship between bond prices and interest rates. The questions were implemented for instance in the Health and Retirement Study (HRS) (Lusardi & Mitchell, 2007a, 2008), the RAND American Life Panel (Lusardi & Mitchell, 2007c) and the Dutch DNB Household survey (DHS) (van Rooij et al., 2011a; van Rooij, Lusardi, & Alessie, 2011b).

So far, economic literature on financial literacy has often focused on the role of financial literacy in savings behaviour and stock market participation (Deuflhard, Georgarakos, & Inderst, 2018; van Rooij et al., 2011b) and in retirement planning (Bucher-Koenen & Lusardi, 2011; Lusardi & Mitchell, 2007c; van Rooij et al., 2011a). Van Rooij et al. (2011b) showed that a low level of financial literacy acts as a significant deterrent to stock ownership. Additionally, they extended their empirical model with risk aversion, cognitive ability (as a complement to financial literacy) and peer effects and still found positive and statistically significant estimates. Lusardi, Michaud and Mitchell (2017) developed a stochastic life cycle model that features endogenous financial knowledge and a sophisticated saving technology allowing for uncertainty and imperfect insurance. Their intuition is that better financial knowledge enables individuals to better allocate resources over their lifetime: financially savvy individuals can use sophisticated financial products which, in turn, raise the return on savings. Lusardi et al. (2017) found that 30-40 per cent of US wealth inequality can be attributed to differences in financial knowledge. Also, they found the optimal financial literacy profile to be hump-shaped over the life cycle. Related work by Deuflhard et al. (2018) showed that more financially literate investors earn on average higher savings returns and that more literate households are more able to identify bank accounts yielding higher rates of return across banks. In other words, the rate of return on investments is an increasing function of financial literacy.

[1] Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions [p. 284].

To our knowledge, Jappelli and Padula (2017) are the only authors who link financial literacy[2] and consumption. They derived the Euler equation in a life-cycle setting linking financial sophistication and non-durable consumption growth. In their theoretical model, Jappelli and Padula (2017) allowed for individuals to invest in financial literacy. Subsequently, they tested the prediction of their model using the Italian Survey of Household Income and Wealth. As financial literacy is an endogenous variable in this setting, they used an instrumental variables (IV) approach to tackle this issue. They found that having a one point higher financial sophistication score (on a scale from 0-3) is associated with a 5.3 percent higher non-durable consumption growth. Jappelli and Padula did not consider self-assessed financial knowledge in their theoretical and empirical models.

Building upon this work, we want to examine how financial literacy is related to household consumption growth and consumption levels. Similar to Jappelli and Padula (2017), we derive the Euler equation in a life-cycle setting. In contrast with Jappelli and Padula, who introduced uncertainty to their model, we first derived the Euler equation assuming full certainty. We recognise that estimating the Euler equation can be problematic due to the short observation period of consumption causing the estimates to be too noisy— see Attanasio and Low (2004) for a technical discussion on the assumptions needed to consistently estimating Euler equations. Therefore, we derived a closed-form solution for consumption as a function of financial literacy, assets and income in an environment of certainty. We assumed full certainty in order to elicit the total effect of an increase in the rate of return (due to a higher financial literacy level) on consumption levels. It turns out that financial literacy has a positive effect on consumption levels. Additionally, a closed-form solution enables us to identify different consumption profiles for different rates of return.

To test the predictions of the model, namely a positive association between financial literacy and consumption growth and a positive association between financial literacy and consumption levels, we utilised data from the LISS panel, a representative survey of Dutch households. From the LISS panel, we obtained data on financial literacy, household consumption, and demographics.

[2] Jappelli and Padula (2017) consistently refer to financial literacy as financial sophistication. They use three questions to measure financial literacy: interest rate compounding, portfolio diversification and understanding of mortgage contracts. The first two questions are identical to the questions included in the LISS panel.

With this analysis, we want to contribute to the discussion of the importance of financial literacy for the decision-making process of individuals and households. We recognise that estimating the Euler equation using consumption data is problematic due to the availability of short panels. Hence, in order to elicit the impact of financial literacy on consumption, we resort to deriving the closed-form equation assuming full certainty. To our knowledge, we are the first to analyse the financial literacy level of a household head and his or her partner and relate this to household consumption. Moreover, we extended the concept of financial literacy by adding self-assessed financial literacy to our analysis. When asked to assess one's financial knowledge, people will provide their subjective assessment that might deviate from the objective measures that Lusardi and her colleagues have used in their work. Van Rooij et al. (2011b) have recognized in their work the importance of self-assessed financial knowledge and included this dimension in their analysis and observed a strong correlation between both measures. Furthermore, a recent study by Anderson, Baker and Robinson (2017) on precautionary savings and retirement planning found that self-perceptions of financial literacy drive decision-making, especially of low-literacy individuals.

The structure of this paper is as follows: The second section of this paper outlines the theoretical model and derives the Euler equation and a closed-form solution for consumption. In the third section, several descriptive statistics on financial literacy and consumption (growth) and demographic variables are presented at the individual and at the household level. The fourth section describes the estimation method used and the fifth section presents the estimation results. In the sixth section, we report the results for several robustness checks. The last section discusses the results and concludes.

2. Theoretical framework

In order to obtain theoretical insights into the interaction between financial literacy, the rate of return and consumption patterns, we use a simple life-cycle model with full certainty. The model is based on the assumption that consumers want to smooth marginal utility over time (Hall, 1978). Following Jappelli and Padula (2017), financial literacy enters the life-cycle model through the interest rate: a higher financial literacy level is reflected in a higher rate of return on investment. Hence, financially literate households postpone current consumption in order to save now and due to a higher return on savings compared to less literate households, are able to consume more in the future.

We assume a constant real interest rate over time and that no income shocks are present (constant labour income). Both assumptions are needed in order to eliminate potential sources of uncertainty. We consider a model with full certainty for two reasons: 1) we can identify the relationship between different financial literacy levels and household consumption (growth) and 2) it allows us to mathematically derive a relatively simple closed-form solution for consumption. Additionally, we assume that there is no bequest motive, hence $A_T = 0$, where T is the last period in the life cycle and A_T denotes wealth at the end of period T. Following Jappelli and Padula (2017) in their baseline model, we assume perfect capital markets and that there are no liquidity constraints[3]. Furthermore, these assumptions also imply that we can assume without loss of generality that household income is constant over time.

We formulate the following value function:

$$V_0(A_0) = \max_{c_t} \sum_{t=1}^{T} (1+\rho)^{1-t} u(c_t) \tag{2.1}$$

subject to the dynamic budget constraint

$$A_t = \big(1 + r(\varphi)\big)A_{t-1} + y - c_t, \mathrm{t} = 1, \ldots, \mathrm{T}$$

where A_t is wealth at the end of period t and A_0 is set to zero, $r(\varphi)$ is the real rate of return which is a function of the financial literacy level φ, ρ is the rate of time preference, y being labor income (assumed to be constant over time) and c_t being consumption at period t. Similar to Jappelli and Padula (2017), we define $r(\varphi)$ as a strictly increasing and concave function of the financial literacy level. Whereas Jappelli and Padula allow for investment in financial literacy during one's life-time, we simplify this assumption in our theoretical setting by considering φ as exogenously given due to data availability on financial literacy. Hence, the equations we derived are conditional on the optimal financial literacy level.

We define utility to be a general constant relative risk aversion (CRRA) utility function $U(c_t) = \frac{c_t^{1-\gamma}}{1-\gamma}$ where γ is the coefficient of relative risk aversion with $\gamma \neq 0$. This utility function exhibits decreasing absolute risk aversion – a property that is in line with economic intuition. Furthermore, its attractive algebraic properties enable us to derive a closed-from solution for consumption.

[3] Jappelli and Padula found that even when they took borrowing constraints into account in their sensitivity checks by adding the logarithm of lagged disposable household income, the coefficient of financial literacy was barely affected.

Formulating the Bellman equation, optimising it with respect to A_{t+1} (wealth at the beginning of period *t+1*) and using the Envelope Theorem, yields the following Euler equation for a broader time horizon linking consumption growth and financial literacy:

$$u'(c_t) = \left(\frac{1 + r(\varphi)}{1 + \rho}\right)^{\tau - t} u'(c_\tau), \tau = t, \ldots, T \tag{2.2}$$

Plugging in the specified form of the utility function and rewriting the Euler equation for two subsequent periods: period t and $\tau = t + 1$ gives

$$c_{t+1} = \left(\frac{1 + r(\varphi)}{1 + \rho}\right)^{\frac{1}{\gamma}} c_t \tag{2.3}$$

or, when taking the logarithm on both sides:

$$\Delta \log(c_t) = \frac{1}{\gamma} \log\left(\frac{1 + r(\varphi)}{1 + \rho}\right) = \sigma \log\left(\frac{1 + r(\varphi)}{1 + \rho}\right) \cong \sigma(r(\varphi) - \rho) \tag{2.4}$$

where $\Delta \log(c_t) = \log(c_{t+1}) - \log(c_t)$ and $\frac{1}{\gamma} = \sigma$. σ is the intertemporal elasticity of substitution (IES) measuring the willingness to postpone current consumption. Since we assume complete certainty, risk aversion is not a relevant concept.

We can make the following observations about the change of consumption growth $\Delta \log(c_t)$: it is positive if $r(\varphi) > \rho$ and the steepness of the slope is increasing in $r(\varphi)$ for $r(\varphi) > 0$ and for $\sigma > 0$. Hence, the highly literate have a steeper consumption profile than individuals with low literacy provided they have a positive IES. In other words: the steepness of the slope is the substitution effect. It is positive, implying that a higher level of financial literacy makes future consumption relatively less expensive compared to consumption today. In order to afford the same amount of future consumption, one needs to sacrifice less consumption today.

For the sake of overview, we write $r(\varphi)$ as r for the next rather lengthy equations. Rewriting the Euler equation using the preferences defined above and plugging this into the intertemporal budget constraint of the maximisation problem given by

$$\sum_{\tau=t}^{L} \frac{c_\tau}{(1 + r)^{\tau - t}} = (1 + r)A_{t-1} + y \sum_{\tau=t}^{L} \frac{1}{(1 + r)^{\tau - t}} \tag{2.5}$$

eventually yields the following expression for household consumption:

$$c_t = \Lambda^{-1}\left((1+r)A_{t-1} + y\frac{1+r-\left(\frac{1}{1+r}\right)^{L-t}}{r}\right) \tag{2.6}$$

where $\Lambda := \sum_{\tau=t}^{L}(1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}}\left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}$.

Note that the intertemporal budget constraint only holds when $A_T = 0$ implying that there are no bequests in our model. For our analysis, we assume that (im)patience enters the model through the IES, so that we can set the coefficient of time preference equal to zero, $\rho = 0$, which simplifies our computations and does not affect the mechanisms we want to study. Then, $r(\varphi) > \rho$ is always fulfilled as we can assume that financial literacy yields non-negative returns. The closed form solution for consumption simplifies to:

$$c_t = \left(\sum_{\tau=t}^{L}(1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}}\right)^{-1}\left((1+r)A_{t-1} + y\frac{1+r-\left(\frac{1}{1+r}\right)^{L-t}}{r}\right) \tag{2.7}$$

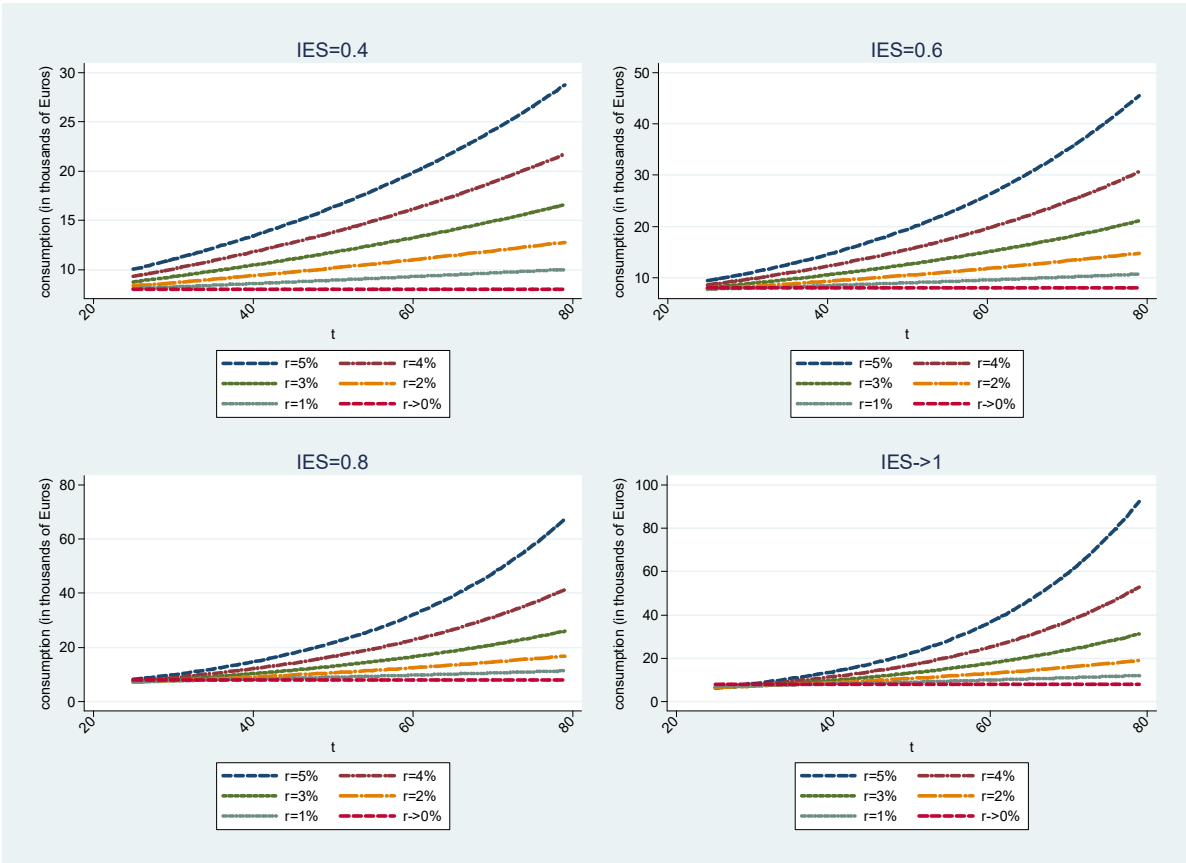
Please refer to Appendix A for a detailed derivation of the Euler equation and the closed-form solution including a full listing of the underlying assumptions.

There are numerous studies that estimated the consumption growth equation using micro and macro data and subsequently differed in their parameter estimates of the IES: Hall (1988) estimated an IES close to zero using US non-durables consumption data (excluding services) derived from the US National Income and Product Accounts. Again, using US aggregate panel data, Beaudry and Wincoop (1996) estimate the IES for non-durable consumption to be "significantly different from zero and probably close to 1" (p. 509). Their estimates of the IES differ depending on how consumption is being defined (non-durable consumption excluding or including services). In a study relating intertemporal substitution, risk aversion and estimating the Euler equation using UK micro data from the Family Expenditure Survey, Attanasio and Weber (1989) estimated the coefficient of relative risk aversion to be 1.46, which corresponds to an IES of 0.68. Jappelli and Padula (2017) estimate the IES to be 0.53 for the full sample and 0.45 for a subsample of 20-65 years old. The common denominator of the cited studies using micro data is a positive IES that is between 0.5 and 0.7 for non-durable consumption excluding services derived from micro data. As will be discussed

in section 3, we have detailed data on household consumption allowing us to exclude expenditures on mortgage, rent and insurances. The short literature overview on the different parameter estimates of IES and the disposal of data on non-durable consumption allow us to focus on an IES between 0.4 and 0.8 (a broader range than IES estimates from the literature would suggest) when using simulations to investigate the relation between household consumption and financial literacy in Figures 1 and 2.

Figure 1 provides simulations of life-cycle consumption for different values of the IES and non-negative rates of return. The consumption profiles are increasing for all rates of return and are steeper for a higher rate of return. A high IES implies that a consumer is more willing to substitute present consumption for future consumption (values future consumption relatively more) than a consumer with a low IES. This results in steeper consumption profiles for consumers with a high IES (pay attention to the y-axes when examining Figure 1).

Figure 1: Consumption profiles for different IES

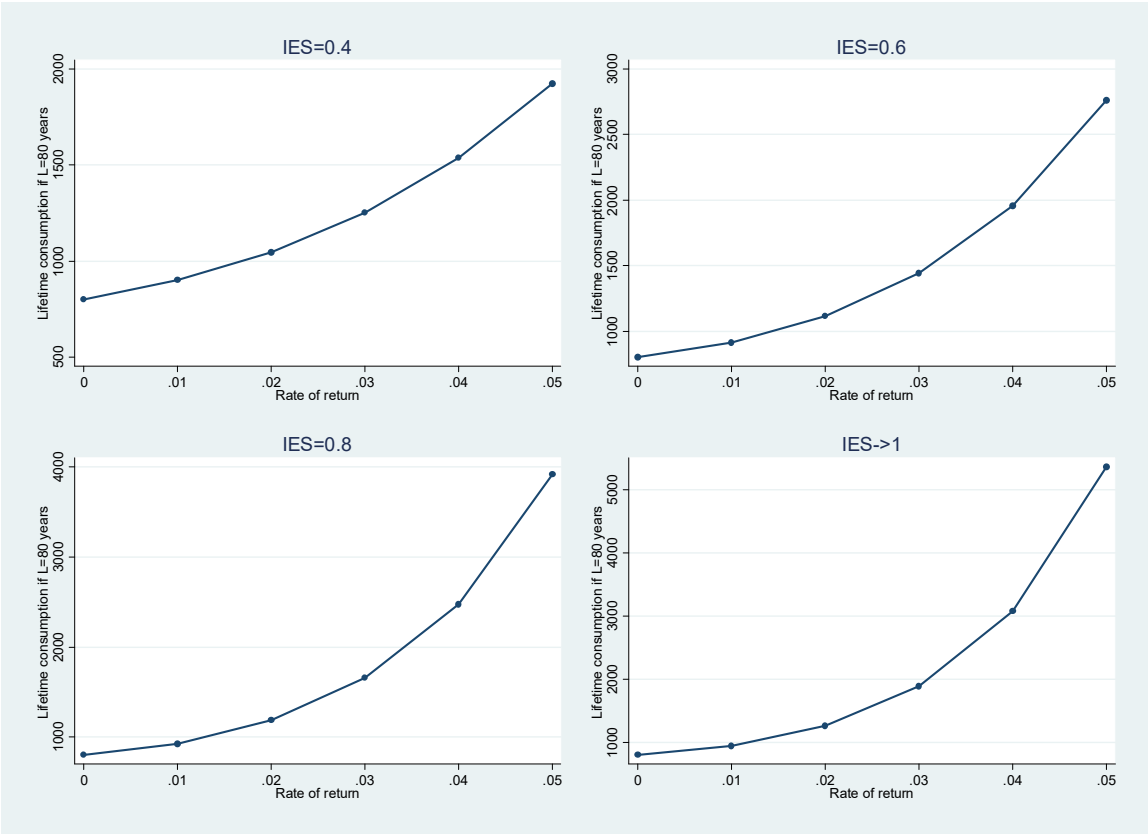


Notes: For the simulations, we used as an approxation of r=0.0001 for $r \to 0$ and $A_0 = 0$. Furthermore, for $IES \to 1$, we used a value of 0.999.

For small t and high IES, consumption profiles for highly literate households appear to start at a lower level than for lower literate households. This initial trade-off is more than compensated the further we advance in the life-cycle (high *t*). See the Appendix for a derivation of the partial derivative of the closed-form solution with respect to the rate of return: consumption is not strictly increasing in r and is (not surprisingly) sensitive to the IES.

Figure 2 plots the undiscounted sum of the consumption levels for each period (life-time consumption) for different IES. We can observe that life-time consumption is increasing in the rates of return for all IES. Differences in rates of return are reflected in higher levels of life-time consumption for higher IES suggesting that financial literacy— entering through the rate of return— has a larger impact on consumption levels for higher IES than for lower IES if we restrict the IES between zero and one. The theoretical predictions that follow from this section are that financial literacy and consumption levels are positively correlated for plausible values of the IES and that financial literacy and consumption growth are positively correlated.

Figure 2: Life-time consumption for different IES



3. Data description and summary statistics

3.1 Data description

Dataset composition

We used data from the LISS panel that is a part of the Measurement and Experimentation in the Social Sciences (MESS) project of CentER data in Tilburg, the Netherlands. This panel is a representative household survey and consists of 4500 Dutch households and 7000 individual respondents since 2007. Knoef and de Vos (2009) have thoroughly tested whether the LISS panel is representative of the Dutch population by comparing some key statistics with data from Statistics Netherlands (CBS) and have in general come to a positive conclusion.

Our dataset has information on demographics of the individual respondents, their financial literacy level (and their perception about their knowledge) and household consumption. The following paragraphs contain more details about the data sources of the main measures used to empirically test the theoretical predictions from section 2.

Objective and subjective financial literacy measures

We used the single wave study from August 2011 on financial literacy. 4858 respondents (from 3298 households) first had to assess their financial knowledge (subjective measure of financial literacy) and subsequently, answered four questions on financial literacy (objective measures of financial literacy)[4]. For some households, more than one respondent answered the questions. The question on subjective financial knowledge was on a simple 7-point Likert scale which we recoded to five categories (the first and last two categories) due to the low number of observations at the tails of the sampling distribution. The four questions on objective financial literacy (we will refer to them as the classic four) tested knowledge on interest compounding, inflation, risk diversification and the relationship between bond prices and interest rates. For the exact wording of all financial literacy questions please refer to Appendix C. The first three questions test basic financial literacy concepts and the fourth financial literacy question is testing advanced financial literacy knowledge as in Lusardi (2015). The questions are multiple choice questions and include the option for respondents to answer with "don't know" or

[4] Note that once respondents have answered the question about their self-assessed financial knowledge and they started answering the first question on financial literacy, they could not go back to adjust their answer to the self-assessment.

"refuse". The financial literacy module also includes data on how interesting people found the subject of financial literacy.

Consumption

Consumption data have been retrieved from the *Consumption and Time Use* longitudinal study comprising five waves collected in the years 2009, 2010, 2012, 2015 and 2017. There can be multiple respondents per household: we considered the answers of household head, partner and (if any) children. On average, there are 5200 observations per wave. The LISS panel has asked repondents to indicate (in Euro) their expenditure per month while distinguishing between consumption of assignable (including expenditures on children living in the household) and non-assignable goods. We borrow this terminology from Bourguignon et al. (1993) who defined expenditures to be "assignable" if the "financial beneficiary of these expenditures in the family is identified" (p.147). We focussed our analysis on consumption of non-durable goods. We aggregated reported expenditures on non-assignable goods for the following subcategories: transport and means of transport, daytrips and holidays with the whole family, expenditure on cleaning the house or maintaining the garden, eating at home and other non-assignable expenditures. Expenditures on assignable goods include food and drinks outside the house, cigarettes, clothing, personal care, leisure time expenditure (film, theater, hobbies etc.). It should be noted that the wording of the questions on assignable expenditures has changed since 2015. To circumvent a possible questionnaire effect in our estimation results, we computed consumption growth for the periods 2009-2013 (before the change in wording) and 2015-2017 (after the change in wording) separately.

To obtain a more complete measure of non-durable consumption, we constructed the following measure: We took the answer of the household head concerning non-assignable expenditures and we added assignable expenditures of the household head together with the assignable expenditures of the partner and children (if available). To be able to compare consumption across households of different sizes, we equivalised consumption using the square root scale (OECD, 2018a).

Next to non-durable consumption, we used two alternative consumption measures in a sensitivity analysis: food consumption and total consumption. Food consumption is supposed to be relatively stable in times of crisis – note that the first waves cover the immediate post-financial- crisis period which might change people's perception on their monthly expenditures. Total consumption is an aggregate of non-durable consumption (assignable and non-

assignable), expenditures on children and durable consumption (mortgages, insurances etc.). Appendix B provides more details on the exact wording of the questions used and how all consumption measures have been computed.

Other relevant characteristics

All waves have information on the age of all household members, the position in the household (e.g. household head or (un)wedded partner), number of children in the household, type of dwelling, education level of the respondent, household size, net monthly household income, occupation and marital status. Those demographics are part of the *Background variables* module of the LISS panel and are available for every month between 2009 and 2017. In case that respondents have participated in modules during different months within the same year (for instance the questions on consumption and assets), we computed the average net household income within each year yielding one representative value of monthly net household income per year. The *Health Core Study* of the LISS panel contains data on objective and subjective health measures for 2009 through 2017. Tables E.1 and E.2 in the Appendix provide more information about all covariates used in our empirical analysis.

Sample selection

After merging and appending all relevant modules from the LISS panel, our gross sample comprises 27640 observations (of 10741 individuals from 7290 households). The observation unit is the household. We added the children's responses to the non-assignable consumption questions to the answers of the parent(s) and subsequently dropped the children's observations. This way, we keep the responses of household heads and, if applicable, of their partners without losing information on the children's consumption. We also chose to drop households with children above 25 years old still living at home. We consider those households to possibly have a different life-cycle behaviour: The chance is higher that, in such households, adult children financially support their parents for instance (or possibly the other way around) which can affect the dynamics of household consumption. So far, we are left with 89% of our gross sample.

As in the financial literacy module a smaller group of panel participants were sampled, the overlap with the consumption data is rather small. This leaves us with only 25% of the gross sample. Cleaning the data for missing information on (at least) one of the variables we study, including recoding the don't know answers to the consumption questions to missing,

results in dropping 390 observations from 53 households. Finally, to avoid our results to be affected by outliers, we remove the top and bottom first percentiles of the total consumption distribution which makes us lose only 4 households (less than 0.5% of the households). Our final sample consists of 5508 observations across all consumption waves from 1820 households and 2620 individuals.

3.2 Summary statistics

Financial literacy (objective)

We first present some simple summary statistics of the objective financial literacy questions (the classic four) at the individual level. Table 1 gives the percentage shares for each financial literacy question by answer type (correct, incorrect don't know or refuse) for women and men. For both male and female respondents, there is a large difference in the percentage of correct answers for the first two questions and the last two questions (see Table 1).

Table 1: Percentage share of correct, incorrect and don't know answers by gender

	Interest	Inflation	Risk	Bonds
Female (n=1223)				
Correct	88.76	73.44	32.07	13.17
Incorrect	5.73	12.24	16.96	30.71
DK	4.44	12.81	49.53	54.76
Refuse	1.07	1.50	1.43	1.36
Male (n=1397)				
Correct	91.66	85.94	54.46	25.76
Incorrect	4.99	7.93	16.27	39.57
DK	2.62	5.07	27.96	33.93
Refuse	0.74	1.06	1.31	0.74

Notes: We test for gender differences for each question using the seemingly unrelated regression model (SUR) with clustered standard errors at the individual level. For the first question, the gender difference is significant at the 5%-level and for the remaining questions— at the 0.1%-level (not reported in the table).

Judging by the percentage of correct answers, the questions about interest compounding and inflation were perceived as easier than the questions on risk diversification and bond prices. The percentage of correct answers for female respondents is consistently lower than their male counterparts for all questions. Also, the share of DK answers is two times larger for females. This is consistent with the findings of Bucher-Koenen et al. (2017) who point out that women have lower knowledge and lack confidence about their financial knowledge.

Table 2: Summary of responses; Weighted percentages of total number of respondents (2620 individuals)

Number of correct, incorrect, don't know and refuse answers (out of four questions)						
	None	1	2	3	All four	**Total**
Correct	5.04	14.20	38.13	30.04	12.60	**2.31**
Incorrect	48.66	37.33	12.25	1.76	0	**0.67**
DK	42.75	26.91	23.02	4.96	2.37	**0.97**
Refuse	97.94	0.72	0.61	0.19	0.53	**0.05**

Table 2 provides an overview of the shares of how many financial literacy questions (out of four) were answered correctly, incorrectly or with "don't know" or refuse. The last column returns the mean value of how many questions were answered correctly, incorrectly etc. The most important information that can be retrieved from this table is that 12.6% of the respondents answered all four questions on financial literacy correctly. On average, 2.31 out of the four questions were answered correctly. Those results are disquieting – the share of correct answers is very low and there is a high share of respondents that chose the do not know (DK) option providing evidence for lack of confidence regarding their knowledge of the financial concepts being tested. When glancing back at Table 1, the high shares of incorrect and "don't know" answers come from the questions on risk diversification and bond prices (questions 3 and 4) respectively. Those observations are consistent with van Rooij et al. (2011b), who used data from the DNB Household Survey from 2005 and found comparable shares of correct, incorrect and "don't know" answers.

Consumption

In what follows, we present summary statistics of the consumption measures (and their components) over time at the household level. In Table 3, we computed the (geometric) mean of equivalised consumption levels over time (in Euro). We chose for the geometric mean as the distribution of the consumption variables is skewed downward. Due to our theoretical setting and in order to be consistent with previous literature on household consumption, we focus our main analysis on non-durable consumption. For the first three waves (years 2009-2012), median non-durable consumption has been declining. The relatively big jump between 2009 and 2010 could be explained by the financial crisis that hit in 2008: Respondents were asked to report monthly expenditures based on the previous year so that the effect of the crisis on people's perceptions becomes visible in the wave of 2010. As already discussed in section 3.1,

the wording of the question on assignable consumption has been changed as of 2015. This also becomes visible in Table 3, as mean non-durable consumption dropped considerably. This can be explained by the fact that the share of assignable consumption in total non-durable consumption is relatively large as compared to the share of assignable consumption in total household consumption. This is why we can check the robustness of our results using total consumption and food consumption.

In Table 4, we computed mean annualised consumption growth over time. We annualised consumption growth due to the gaps between the waves. Throughout the years, consumption growth appears to be zero or slightly negative with the exception of the categories miscellaneous and assignable consumption. For 2015, consumption growth declined by 14% with respect to the previous waves. This unusually large number is most likely due to the questionnaire effect. Having analysed household consumption over time, we can already identify two implications for our empirical analysis: 1) we should separate the pre-change and post-change period when computing consumption growth and 2), we do not observe a clear trend in consumption (growth) over time.

Next, we tabulate consumption (growth) against some selected key variables. In Table 5, we compute mean non-durable consumption (in logs) by age category, education level, financial literacy level (a simple index based on the number of correctly answered classic four financial literacy questions) and self-assessed financial literacy (on a scale of 1-5). All variables at the individual level are observations of the household head. We present the summary statistics for singles and couples separately. Panel A of Table 5 reveals that mean consumption is higher for older individuals (belonging to single or couples household). Panel B shows that mean consumption is higher for more educated individuals in couples houeseholds (see F-tests at the bottom of each panel). Regarding financial literacy, we can observe in Panel C that a higher financial literacy level is associated with a higher consumption level. The last part of Table 5, panel D, shows a positive association between the self-assessed financial literacy level and consumption. Note that those observations hold for singles and couples households. All differences within the groups are statistically significant save for singles in panel A. Table 5 provides suggestive evidence in support of the first empirical implication of our theoretical model – a positive association between household consumption level and financial literacy.

Subsequently, we look at mean consumption growth for the same key variables as described above (see Table 6). We computed consumption growth by obtaining the annualised

consumption growth rate (of the logarithms of equivalised household consumption). In general, we observe negative consumption growth across all key variables. This observation is in line with what we have seen already in Table 4. We cannot observe significant differences across age categories, education levels and (self-assessed) financial literacy levels respectively suggesting no support for the theoretical prediction of a positive association between consumption growth and financial literacy.

Table 3: Consumption levels over time (geometric means, in Euro, equivalised using square root scale)

	wave 1 (2009)		wave 2 (2010)		wave 3 (2012)		wave 4 (2015)		wave 5 (2017)	
Variables	n	mean	n	mean	n	mean	n	mean	n	mean
Household consumption	1154	1167.53	1315	1146.57	1204	1170.93	1074	1138.89	761	1152.35
Personal consumption	1154	262.06	1315	246.37	1204	236.07	1074	155.58	761	164.78
Total consumption	**1154**	**1438.61**	**1315**	**1376.18**	**1204**	**1394.98**	**1074**	**1294.87**	**761**	**1340.91**
Variables	n	mean	n	mean	n	mean	n	mean	n	mean
Food	**1154**	**196.06**	**1315**	**190.34**	**1204**	**192.01**	**1074**	**187.38**	**761**	**196.01**
Transport	1154	74.19	1315	73.50	1204	76.67	1074	72.42	761	71.50
Cleaning	1154	27.23	1315	25.86	1204	26.03	1074	25.85	761	25.59
Holidays	1154	93.67	1315	89.41	1204	95.05	1074	91.68	761	103.86
Misc.	1154	99.57	1315	73.67	1204	69.82	1074	69.12	761	78.03
Personal consumption	1154	262.06	1315	246.37	1204	236.07	1074	155.58	761	164.78
Total Non-durables	**1154**	**735.44**	**1315**	**704.24**	**1204**	**701.95**	**1074**	**607.43**	**761**	**644.55**

Notes: All means are geometric means in this table. The variables in bold are the three consumption measures that we use in our analysis. Total household consumption consists of non-assignable and assignable expenditures including both non-durables and durables. Total non-durable consumption is the measure we use throughout our analysis in the main text using selected categories of non-durables consumption. The total number of observations deviates from the total number of observations in Tables 1 and 2 as the former statistics are at the household level and the latter are at the individual level. Deviations are due to household transitions. For instance, we report the financial literacy level of an individual only once. If this individual was first single and later became part of a couples' household, then she appears in Tables 3 through 6 twice: first under singles and later under couples. The trend-break due to the questionnaire effect from 2015 onwards can be detected by comparing median assignable consumption across the waves.

Table 4: Annualised consumption growth over time (arithmetic means, equivalised using square root scale)

	wave 2 (2010)		wave 3 (2012)		wave 4 (2015)		wave 5 (2017)	
Variables	n	mean	n	mean	n	mean	n	mean
Non-assignable consumption	944	-0.015	1088	0.006	959	-0.006	723	-0.023
Assignable consumption	944	-0.022	1088	-0.024	959	-0.137	723	-0.002
Total household consumption	**944**	**-0.020**	**1088**	**0.007**	**959**	**-0.032**	**723**	**-0.031**
Variables	n	mean	n	mean	n	mean	n	mean
Food	**944**	**-0.003**	**1088**	**-0.004**	**959**	**-0.003**	**723**	**0.013**
Transport	944	0.003	1088	-0.004	959	-0.029	723	-0.023
Cleaning	944	-0.018	1088	0.012	959	0.005	723	0.000
Assignable consumption	944	-0.022	1088	-0.024	959	-0.137	723	-0.002
Holidays	944	-0.015	1088	0.000	959	-0.012	723	-0.011
Misc.	944	-0.169	1088	-0.022	959	-0.008	723	0.008
Total non-durables	**944**	**-0.016**	**1088**	**-0.006**	**959**	**-0.046**	**723**	**0.006**

Notes: All means are arithmetic means (of already annualised growth rates) in this table. The variables in bold are the three consumption measures that we use in our analysis. Total household consumption consists of non-assignable and assignable expenditures including both non-durables and durables. Total non-durable consumption is the measure we use throughout our analysis in the main text using selected categories of non-durables consumption. In this table, we present figures on annualised and equivalised consumption growth for every available year (in percentage shares). Those computations are based on the observations from Table 3 and do not take into account the trend-break. See Appendix C for more details on how consumption growth has been computed.

Table 5: Non-durable consumption by age, education level, financial literacy level and self-assessed financial literacy (SAFL) for single households and couples

		Log(adjusted household consumption), in %			
		Singles		Couples	
		n	mean	n	mean
A. Age categories*	18-40 years	499	6.347	339	6.504
	40-64 years	1488	6.395	1197	6.688
	65+ years	1020	6.422	965	6.728
	Total	3007		2501	
	F-test for equality of means (p-value)	0.072		0.000	
B. Education level*					
	Low education	1126	6.265	738	6.562
	Medium education	857	6.360	819	6.595
	High education	1024	6.570	944	6.843
	Total	3007		2501	
	F-test for equality of means (p-value)	0.000		0.000	
C. FL level (0-4)*	0	187	6.215	46	6.431
	1	508	6.222	167	6.431
	2	1143	6.373	770	6.556
	3	845	6.466	1004	6.750
	4	324	6.670	514	6.826
	Total	3007		2501	
	F-test for equality of means (p-value)	0.000		0.000	
D. SAFL(1-5)*	1	146	6.214	67	6.458
	2	250	6.311	152	6.537
	3	609	6.387	292	6.619
	4	1014	6.381	815	6.619
	5	988	6.466	1175	6.766
	Total	3007		2501	
	F-test for equality of means (p-value)	0.000		0.000	

Notes: * refers to age category, education level and financial literacy level of the household head. The F-test tests for equality of the means.

Table 6: Non-durable consumption growth by age, education level, financial literacy level and self-assessed financial literacy (SAFL) for single households and couples

		Consumption growth (annual growth rate): Δlog(consumption)			
		Singles		Couples	
		n	mean	n	mean
A.					
Age categories*	18-40 years	228	-0.003	180	-0.008
	40-64 years	993	-0.022	809	-0.007
	65+ years	777	-0.023	727	-0.020
	Total	1998		1716	
	F-test for equality of means (p-value)	0.744		0.686	
B.					
Education level*					
	Low education	789	-0.011	489	0.005
	Medium education	534	-0.017	565	-0.027
	High education	675	-0.032	662	-0.014
	Total	1998		1716	
	F-test for equality of means (p-value)	0.518		0.231	
C.					
	0	119	-0.031	23	-0.012
FL level (0-4)*	1	340	0.002	103	0.032
	2	762	-0.029	520	-0.016
	3	559	-0.018	707	-0.017
	4	218	-0.020	363	-0.014
	Total	1998		1716	
	F-test for equality of means (p-value)	0.741		0.644	
D.					
SAFL(1-5)*	1	94	-0.057	42	-0.030
	2	164	-0.076	99	-0.009
	3	405	-0.034	192	0.007
	4	665	-0.017	547	-0.006
	5	670	0.005	836	-0.022
	Total	1998		1716	
	F-test for equality of means (p-value)	0.068		0.734	

Notes: * refers to age category, education level and financial literacy level of the household head. The F-test tests for equality of the means. We computed consumption growth for every year available for consistency reasons. In our empirical analyses, we correct for the questionnaire effect when considering consumption growth.

4. Methodology

In this section, we propose specifications in order to test our empirical predictions formulated in the theoretical section. First, we tested the relationship between financial literacy and household consumption levels by estimating the closed-form solution derived in the theoretical section. In their work, Lusardi and Mitchell (2008) and Bucher-Koenen et al. (2017) point out the importance of the gender gap when researching financial literacy. We confirmed gender differences when exploring the financial literacy data in Table 1. Following this line, we decided to estimate the closed-form equation for singles and couples separately. Subsequently, we examined the relationship between financial literacy and percentage consumption growth. All specifications are estimated using pooled Ordinary Least Squares (OLS) with clustered standard errors at the household level.

Consumption level and financial literacy

We turn to estimating equation (2.7), the closed-form solution for consumption in terms of financial literacy. We estimated the closed-form solution for single men, women (see equation (4.1)) and couples (equation (4.2)) separately. The dependent variable is (the logarithm of) non-durable consumption. The main independent variable is the total score on each of the classic four financial literacy questions (FL) and self-assessed financial knowledge ($SAFL$). We included time dummies captured by τ_t and a set of individual and household characteristics summarised by the vector Z_{it} for singles and by the vector $Z_{it,j}$ for couples where j denotes partner 1 or partner 2. For couples, we included the set of covariates that we observe at the individual level for both adults.

Singles: $$\log(cons_{it})^{singles} = \alpha_1 FL_i + \alpha_2 SAFL_i + \delta' Z_{it} + \tau_t + v_{it}^{singles} \tag{4.1}$$

Couples: $$\log(cons_{ht})^{couples} = \sum_{j=1}^{2} \beta_j FL_{i,j} + \sum_{j=1}^{2} \beta_{j+2} SAFL_{i,j} + \sum_{j=1}^{2} \mu' Z_{it,j} + \tilde{\tau}_t + v_{it}^{couples} \tag{4.2}$$

As income and consumption are positively correlated when considering levels, we control for income in equations (4.1) and (4.2). By including income, we make sure that our results are not driven by income effects. Note that we are interested in eliciting the role of (self-assessed) financial literacy on household consumption for a *given* level of income.

Another important control variable when studying life-cycle behaviour is (self-reported) health. Health acts as a constraint on consumption opportunities of the elderly resulting in a declining consumption trajectory in age (see Börsch-Supan, 1992 and Börsch-Supan & Stahl, 1991 for more details). In our models, we included subjective and objective health (measured by healthy Body Mass Index). As we have shown in our theoretical model, consumption profiles are increasing in age— this is why we need to control for individual age in our models. Other important covariates are education level (due to its high correlation with financial literacy) and the gender of the household head (to see whether there are differences in consumption decisions in couples' households depending on the gender of the household head).

As life-cycle consumption patterns of households with children are different from households without children, we also controlled for whether there are children living in the household (below 25 years old). In a study on the influence of household composition on household expenditure patterns, Deaton, Ruiz-Castillo and Thomas (1989) formalised "the notion that there are groups of goods (adult goods) that have little or no relationship to specific classes of household demographics (the numbers […] of children)" (p.179). Using Spanish household consumption data, they found that adult goods are genuinely separable from children meaning that the effect of having children on consumption of adult goods like alcohol is essentially an income effect. For goods like baby-food or going to the movies, households reallocate their household budget to adjust to the new circumstances (Deaton et al., 1989, pp. 181–182), implying a substitution effect. Controlling for children in the household captures the changes in non-durable consumption (that includes alcohol consumption, baby-food, going to the movies) due to income or substitution effects. Furthermore, we controlled for other demographic factors like type of dwelling, marital status, and occupation. For a detailed description of all covariates included, see Appendix E.

Consumption level: Interactions within couples (FL and SAFL)

We observe (self-reported) financial literacy for the household head and his or her spouse, and are interested in exploring whether there are any interactions between the spouses' financial literacy levels. We expand equation (4.2) by adding two interaction terms to the couples' equation— one interacting both individual financial literacy indices (*FL*) and one interacting both individual self-reported financial knowledge responses (*SAFL*) respectively. In order to estimate comparable individual effects of the financial literacy variables to equation (4.2), we

constructed the interaction terms by expressing the financial literacy variables in deviation of their means. See equation (4.3) for the complete specification:

$$\log(cons_{ht})^{couples} = \sum_{j=1}^{2} \beta_j FL_{i,j} + \sum_{j=1}^{2} \beta_{j+2} SAFL_{i,j} + \eta_1 \prod_{j=1}^{2} \widetilde{FL}_{i,j} + \eta_2 \prod_{j=1}^{2} \widetilde{SAFL}_{i,j} + \sum_{j=1}^{2} \mu' Z_{it,j} + \tau_t + v_{it}^{couples} \quad (4.3)$$

Where $\widetilde{FL}_{i,j} = FL_{i,j} - \overline{FL}_j$ and $\widetilde{SAFL}_{i,j} = SAFL_{i,j} - \overline{SAFL}_j$.

Consumption growth and financial literacy

As we have seen in our simulations in section 2, the slopes of the consumption profiles differ due to different financial literacy levels: slopes are steeper for a higher financial literacy level. We included (self-assessed) financial literacy on the right-hand side of the consumption growth equation despite that we only observe financial literacy once. The empirical translation of the consumption growth (Euler) equation derived in section 2 (equation (2.2)) is given by (4.4). We pooled singles and couples when estimating the Euler equation which relates consumption growth and financial literacy as the estimation results did not differ when we estimated the equations separately for singles (men and women separately as well) and for couples[5]. The dependent variable is annualised equivalised non-durable consumption growth in logs – hence we look at the variation of consumption growth in percentages. See Appendix C for the formulae used to compute consumption growth.

We included a set of time-invariant controls (in levels) and time-variant controls (in first-differences) captured by the vectors $D_{i,j}$ and $\Delta Z_{it,j}$ respectively. $D_{i,j}$ includes education of the household head (and partner) and gender of the household head. $\Delta Z_{it,j}$ includes health transitions, the change in whether there are children living at home, change in occupation, change in type of dwelling and change in marital status. We excluded income, as the life cycle-permanent income hypothesis posits that (lagged) income should not have any explanatory power with respect to consumption (Hall, 1978). This is also suggested by the Euler equation

[5] The estimation results of the separate estimations are available upon request from the corresponding author.

we derived in our theoretical model (see equation 2.2). Note that for single households, we set the characteristics of the second adult to zero by default. We did not include time effects.

$$\Delta\log(cons_{it}) = \sum_{j=1}^{2} \gamma_j FL_{i,j} + \sum_{j=1}^{2} \gamma_{j+2} SAFL_{i,j} + \sum_{j=1}^{2} \beta' D_{i,j} + \sum_{j=1}^{2} \mu' \Delta Z_{it,j} + v_{it} \qquad (4.4)$$

5. Results

In this section, we present three sets of results: Firstly, the estimations of the consumption equations (4.1) and ((4.2); Secondly, we tested whether (self-assessed) financial literacy of individuals who are part of a couple household influence each other and can explain some variation in consumption (growth), that is equation (4.3), and thirdly, we estimated the Euler equation (4.4). All results reported in the main text concern non-durable consumption. Estimation results involving the alternative consumption measures— total household consumption and food consumption— can be found in Appendix F.

5.1 Closed-form consumption equation

We estimated equation (4.1) for single households (men and women separately) and (4.2) for couples. In Table 7, we present the estimated coefficients for three sets of specifications: the first specification (columns 1-3) excludes self-assessed financial literacy, the second (columns 4-6) excludes the objective financial literacy measure and the third (columns 7-9) contains both financial literacy measures. We find evidence for a strong positive association of 5.5% between financial literacy and consumption levels and self-assessed financial literacy and consumption levels (2.8%) for men if they are part of a couple household. For single women, we find a weaker association of 4% (significant at the 10%-level) between financial literacy and consumption levels. We find that including self-assessed financial literacy does not change the magnitude of the association between financial literacy and consumption.

We had expected that the signs of the estimates of the educational dummies would correspond with the signs of the estimates of the financial literacy variables due to the positive correlation between education and financial literacy. Interestingly, education appears not to be an important covariate. For singles, there were no statistically significant differences in consumption levels across education levels. For couples, we found that higher educated men are associated with higher household consumption relative to medium-educated men. Table 7 also indicates that consumption levels are sensitive to income: Households belonging to the

richer part of the income distribution (last two quintiles) have a higher consumption level and household belonging to the lower part of the income distribution (first two quintiles) – a lower consumption level. Consumption levels appear to be less sensitive to income when looking at food consumption (Appendix, table F3).

Please refer to Table F2 in Appendix F for the reported coefficients of the other covariates. Those results are in line with our first theoretical prediction. The fact that we do not find (strong) associations between financial literacy and consumption levels for singles but we do find encouraging results for couples, suggests that it is worthwhile to take a look at possible interactions of individual financial literacy levels (of the household head and his or her partner) within couples. We will come back to this in the next section.

As already discussed earlier, we used two additional measures of household consumption, next to non-durable consumption: total household consumption (the sum of assignable and non-assignable consumption) and food consumption (only in-house). We report the estimation results for those two measures in Tables F2 and F3 in the Appendix. When considering total household consumption, the association between (self-assessed) financial literacy and consumption levels vanishes. Regarding food consumption, the association between financial literacy both for men and women and consumption becomes stronger (the coefficients for singles almost double) at the expense of the role of self-assessing one's own financial knowledge (all coefficients are not statistically significant).

As our theoretical derivation of the closed-form consumption equation includes the lag of assets explicitly (see equation (2.7)), we repeated our analysis including household assets on a sub-sample of households. Data on household assets was only available for a subsample of households as household assets were asked in a different set of questionnaires causing the number of observations to drop. The coefficients are reported in Table F5 in the Appendix. We find that the correlation between assets and consumption is not very strong and that the coefficients of the financial literacy measures do not change much. In our baseline specification, we controlled for the type of dwelling (self-owned house, rental dwelling etc.) which already might capture a large part of the wealth situation of a household in combination with household income.

Table 7: Closed-form non-durable consumption estimations

	(1) singles F	(2) singles M	(3) couples	(4) singles F	(5) singles M	(6) couples	(7) singles F	(8) singles M	(9) couples
FL index (0-4), w	0.041*		-0.012				0.040*		-0.009
	(0.021)		(0.016)				(0.021)		(0.016)
Self-assessed financial knowledge (1-5), w				0.013		-0.011	0.011		-0.008
				(0.015)		(0.011)	(0.015)		(0.011)
FL index (0-4), m		0.041	0.064***					0.035	0.056***
		(0.026)	(0.015)					(0.026)	(0.015)
Self-assessed financial knowledge (1-5), m					0.033	0.039***		0.026	0.028**
					(0.020)	(0.013)		(0.021)	(0.014)
Low education dummy, w	-0.027		0.046	-0.039		0.047	-0.029		0.048
	(0.049)		(0.033)	(0.048)		(0.033)	(0.049)		(0.033)
High education dummy, w	0.061		0.044	0.076		0.045	0.064		0.049
	(0.045)		(0.037)	(0.046)		(0.037)	(0.046)		(0.036)
Low education dummy, m		-0.048	-0.011		-0.072	-0.023		-0.050	-0.004
		(0.057)	(0.035)		(0.053)	(0.035)		(0.057)	(0.035)
High education dummy, m		0.023	0.078**		0.037	0.085***		0.024	0.077**
		(0.060)	(0.032)		(0.060)	(0.032)		(0.060)	(0.032)
1st quintile income	-0.432***	-0.404***	0.018	-0.435***	-0.406***	0.009	-0.431***	-0.401***	0.017
	(0.057)	(0.071)	(0.069)	(0.057)	(0.070)	(0.073)	(0.058)	(0.071)	(0.070)
2nd quintile income	-0.130***	-0.184***	-0.104**	-0.124***	-0.187***	-0.105**	-0.128***	-0.185***	-0.099**
	(0.047)	(0.056)	(0.047)	(0.047)	(0.057)	(0.047)	(0.047)	(0.057)	(0.047)
4th quintile income	0.186***	0.227***	0.204***	0.195***	0.220***	0.204***	0.188***	0.220***	0.204***
	(0.060)	(0.063)	(0.034)	(0.060)	(0.063)	(0.034)	(0.060)	(0.063)	(0.035)
5th quintile income	0.138	0.286***	0.414***	0.157	0.280***	0.418***	0.143	0.272***	0.407***
	(0.102)	(0.099)	(0.040)	(0.099)	(0.098)	(0.040)	(0.102)	(0.099)	(0.040)
Observations (Number of clusters)	1,728 (598)	1,279 (434)	2,501 (816)	1,728 (598)	1,279 (434)	2,501 (816)	1,728 (598)	1,279 (434)	2,501 (816)
R-squared	0.334	0.278	0.308	0.331	0.277	0.303	0.335	0.280	0.310
F-test SAFL=FL=0 (p-value)							0.109	0.131	0.000
F-test SAFL(m)=SAFL(w)=0 (p-value)						0.011			0.102
F-test FL(m)=FL(w)=0 (p-value)			0.000						0.001

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Non-durable consumption has been equivalised and is in logs. FL index is a simple measure of the number of financial literacy questions answered correctly (0-4). We controlled for subjective and objective (measured by healthy Body Mass Index) health, whether children live in the household, type of dwelling dummies (self-owned, rental, sub-rental, cost-free), occupational dummies (for couples the sum of two dummies, one for each adult), age dummies, household size, education level, gender of the household head, and the position in the income distribution in quintiles. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Time dummies are included. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively (Ho: no joint significance).

5.2 Interacting (self-assessed) financial literacy within couples

The next step of our main empirical analysis is to examine for couples whether there are interactions between the partners' (self-assessed) financial literacy levels that could have an impact on consumption at the household level. Table 8 presents the estimated coefficients for non-durable consumption. Once we include interaction terms for self-assessed financial literacy (men and women) and for the financial literacy index (men and women) in deviations of its mean, the positive association between all financial literacy measures and consumption levels is unchanged compared to Table 8 (this is by construction). We find that differences between the financial literacy level of men and women do not explain any variation in total household consumption and food consumption (see Tables F6 and F7 in the Appendix for the reported results). Hence, we find that different combinations of financial literacy levels within couples are not responsible for different consumption levels: the financial literacy level of the man in the couple seems to be driving the results even when we control for the gender of the household head.

Table 8: Closed-form consumption equation with interactions in (self-assessed) financial literacy within couples

	(1)	(2)	(3)
$(\text{FL index}_w - \overline{\text{FL index}_w}) * (\text{FL index}_m - \overline{\text{FL index}_m})$	-0.002		-0.001
	(0.013)		(0.013)
FL (0-4), w	-0.012		-0.010
	(0.016)		(0.016)
FL (0-4), m	0.058***		0.050***
	(0.014)		(0.015)
$(\text{SAFL}_w - \overline{\text{SAFL index}_w}) * (\text{SAFL}_m - \overline{\text{SAFL}_m})$		-0.007	-0.004
		(0.009)	(0.010)
SAFL (1-5), w		-0.011	-0.008
		(0.011)	(0.011)
SAFL (1-5), m		0.035***	0.026*
		(0.013)	(0.013)
Observations	2,501	2,501	2,501
R-squared	0.315	0.312	0.318
F-test FL index w (p-value)	0.723		0.828
F-test FL index m (p-value)	0.000		0.004
F-test SAFL w (p-value)		0.450	0.661
F-test SAFL m (p-value)		0.015	0.132

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level for 816 clusters). FL refers to financial literacy and SAFL refers to self-assessed financial knowledge. The financial literacy index and self-assessed financial knowledge are in deviation of their respective mean. We report the estimated coefficients, not marginal effects. We use the same set of independent variables as in previous analyses. Time dummies are included. We tested for joint significance of FL (SAFL) and the corresponding interaction term respectively (Ho: no joint significance).

5.3 Consumption growth equation

Next, we consider the estimations of the Euler equation for consumption, as specified in equation (4.4). As we did not find significant differences between the models for singles and couples, we decided to pool the data and control for the household type instead. Note that in our estimations of the Euler equation, we excluded consumption growth between 2015 and 2009, 2010, 2012 respectively due to change in the wording of the question on assignable consumption. The estimation results are presented in Table 9. For the estimations showing all coefficients for all three consumption measures, see Table F4 in the Appendix. We do not find evidence for an association between (self-assessed) financial literacy and non-durable and total consumption growth. Those results are consistent with the raw correlations we discussed in section 3.2 (Table 6). Note that we also tried a specification with instrumental variables (IV), using the number of books and the occupation of the mother and father of the respondents as instruments. The IV results were comparable to the OLS results, hence we decided not to report the IV estimates here and show the more efficient (still insignificant) OLS coefficients.

For food consumption (see Table F4 in the Appendix), we found a negative association between female self-assessed financial literacy and consumption growth. As this is the only significant result across several specifications, we should be cautious about putting too much weight on its interpretation.

Table 9: Consumption growth (Euler) estimations

	(1)	(2)	(3)
FL index (0-4), w	-0.005		-0.005
	(0.007)		(0.008)
FL index (0-4), m	0.007		0.004
	(0.007)		(0.009)
SAFL (1-5), w		-0.001	0.001
		(0.005)	(0.005)
SAFL (1-5), m		0.007	0.006
		(0.007)	(0.008)
Low education dummy, w	0.011	0.012	0.012
	(0.016)	(0.016)	(0.016)
High education dummy, w	-0.004	-0.006	-0.003
	(0.018)	(0.018)	(0.018)
Low education dummy, m	0.016	0.014	0.014
	(0.019)	(0.020)	(0.020)
High education dummy, m	0.025	0.024	0.024
	(0.017)	(0.017)	(0.017)
Observations	2,755	2,755	2,755
R-squared	0.013	0.013	0.014
F-test FL(m)=FL(w)=0 (p-value)	0.490		0.776
F-test SAFL(m)=SAFL(w)=0 (p-value)		0.536	0.796
F-test SAFL=FL=0 (p-value)			0.715

*** p<0.01, ** p<0.05, * p<0.1

Notes: Clustered standard errors in parentheses (at the household level, 1426 clusters). FL index is a simple measure of the number of financial literacy questions answered correctly (0-4). SAFL refers to self-assessed financial literacy (on a 5-point Likert scale). We controlled for the annual change in subjective and objective health (measured by healthy Body Mass Index), annual change if children were living in the household, annual change in the type of dwelling (self-owned, rental, sub-rental, cost-free), annual change of occupation (for couples the sum of two dummies, one for each adult), education level and gender of the household head. Medium education, paid employment, self-owned dwelling are the reference categories. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively (Ho: no joint significance).

6. Robustness checks

6.1 Different stages in life cycle (age groups)

We start checking the sensitivity of our results by testing whether households belonging to different age groups have different consumption profiles. Our complete sample comprises the ages 18 until 93 suggesting that the households we examined can be at numerous stages of the life-cycle. We examined very young workers who probably are not very aware of the concept of pensions simultaneously with individuals who are already retired for quite some time. We repeat our analyses for the following sub-samples: In the first sub-sample we exclude households with a household head above 65 and below 20 years old focusing on the general

working population (we still include occupational dummies); the second sub-sample comprises households with a household head between 40 and 65 years old representing the age where people probably invest most during their life; the last sub-sample includes only the households with a household head of above 65 years old, which was the statutory retirement age during the survey period.

The estimation results of the closed-form solution are presented in Table 10. For single women, there is no association between the financial literacy measures and consumption levels except for women above 65 years old. For senior single women, a higher financial literacy index is associated with a 9 per cent higher consumption level. In the baseline results in Table 7, we estimated a positive association of 4 per cent (though only significant at the 10%-level) for single women. Hence, the latter result can be explained by the important role that financial literacy plays for senior women. Note that this also includes women who were first part of a couples' household and are divorced or widowed. As the subsample of the above 65 years old is relatively small, the association becomes weaker once we look at all single women.

For single men, we find weak positive associations between the financial literacy index and consumption levels (significant at the 10%-level) for the 20-65 years old and the 40-65 years old and no association for the above 65 years old. This association disappears when considering the entire sample (cf. Table 7) due to the lack of precision of the estimates for the subsamples. Regarding couples, we find a strong positive association between the financial literacy level of men and consumption levels for all subsamples except for the above 65 years old. For the above 65 years old, we find a positive association between self-assessed financial literacy of men and consumption. The significant coefficients for the financial literacy measures of men in couples' households in Table 7 can be hence explained by two factors: the financial literacy of men is relevant for men younger than 65 years and their self-assessed knowledge is relevant for men above 65 years old. The financial literacy level of women is a relevant determinant of consumption decisions for single women above 65 years old.

Table 10: Closed-form estimations non-durable consumption (different age groups)

	Age ∈ [20, 65]			Age ∈ [40, 65]			Age> 65		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	singles F	singles M	couples	singles F	singles M	couples	singles F	singles M	couples
FL index (0-4), w	0.024		-0.001	0.005		-0.012	0.089**		-0.033
	(0.025)		(0.018)	(0.031)		(0.021)	(0.036)		(0.031)
SAFL (1-5), w	0.018		-0.003	0.024		-0.002	-0.002		-0.021
	(0.019)		(0.014)	(0.022)		(0.015)	(0.023)		(0.017)
FL index (0-4), m		0.055*	0.070***		0.061*	0.078***		-0.009	0.016
		(0.031)	(0.018)		(0.036)	(0.021)		(0.043)	(0.026)
SAFL (1-5), m		0.011	0.026		0.026	0.016		0.056	0.055**
		(0.023)	(0.016)		(0.027)	(0.018)		(0.048)	(0.022)
Low education dummy, w	-0.041		0.054	-0.053		0.072*	0.035		0.120**
	(0.064)		(0.039)	(0.069)		(0.043)	(0.080)		(0.056)
High education dummy, w	0.096*		0.024	0.130**		-0.000	-0.002		0.224***
	(0.051)		(0.041)	(0.063)		(0.048)	(0.090)		(0.070)
Low education dummy, m		-0.047	-0.026		-0.057	-0.047		-0.000	0.031
		(0.064)	(0.043)		(0.072)	(0.049)		(0.114)	(0.054)
High education dummy, m		-0.058	0.049		-0.080	0.066		0.284**	0.134**
		(0.065)	(0.036)		(0.077)	(0.041)		(0.115)	(0.064)
1st quintile income	-0.373***	-0.414***	-0.013	-0.408***	-0.358***	-0.012	-0.536***	-0.399***	0.193
	(0.070)	(0.075)	(0.077)	(0.082)	(0.091)	(0.086)	(0.091)	(0.145)	(0.131)
2nd quintile income	-0.105*	-0.195***	-0.124**	-0.093	-0.188***	-0.130*	-0.183**	-0.167	-0.053
	(0.053)	(0.059)	(0.061)	(0.063)	(0.069)	(0.067)	(0.086)	(0.130)	(0.074)
4th quintile income	0.182**	0.292***	0.241***	0.170*	0.294***	0.229***	0.210**	0.051	0.147***
	(0.075)	(0.069)	(0.047)	(0.088)	(0.075)	(0.055)	(0.099)	(0.118)	(0.054)
5th quintile income	0.090	0.299**	0.427***	0.087	0.264**	0.423***	0.292*	0.173	0.390***
	(0.119)	(0.121)	(0.048)	(0.123)	(0.132)	(0.054)	(0.149)	(0.156)	(0.067)
Observations (Number of clusters)	1,133 (441)	928 (351)	1,614 (598)	850 (319)	718 (257)	1,275 (497)	591 (215)	349 (133)	887 (345)
R-squared	0.320	0.273	0.332	0.320	0.281	0.313	0.388	0.361	0.343
F-test SAFL=FL=0 (p-value)	0.329	0.135	0.000	0.510	0.094	0.001	0.047	0.505	0.055
F-test SAFL(m)=SAFL(w)=0 (p-value)			0.269			0.677			0.033
F-test FL(m)=FL(w)=0 (p-value)			0.000			0.001			0.563

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). We use the same set of independent variables as in previous analyses. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Time dummies are included. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively.

Table 11: Annual consumption growth estimations (different age groups)

	(1) Age ϵ [20, 65]	(2) Age ϵ [40,65]	(3) Age>65
SAFL (1-5), w	-0.000	-0.003	0.003
	(0.006)	(0.007)	(0.009)
FL index (0-4), w	-0.005	-0.012	0.001
	(0.010)	(0.012)	(0.015)
SAFL (1-5), m	-0.002	-0.006	0.025
	(0.008)	(0.010)	(0.021)
FL index (0-4), m	0.006	0.008	0.000
	(0.011)	(0.013)	(0.014)
Observations	1,761	1,438	994
R-squared	0.017	0.031	0.024
F-test FL(m)=FL(w)=0 (p-value)	0.780	0.547	0.999
F-test SAFL(m)=SAFL(w)=0 (p-value)	0.967	0.749	0.468
F-test SAFL=FL=0 (p-value)	0.956	0.712	0.693

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level for 989, 821 and 591 clusters respectively from left to right). We use the same covariates and reference categories as in previous analyses. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively.

The above analysis encouraged us to try to explore a possible interaction between age and (self-assessed) financial literacy for couples. We wanted to check whether the association between mean (self-assessed) financial literacy and consumption levels change with the age of the household head. The estimation results of this specification are presented in Table F8 in the Appendix for all three consumption measures. We did not find any evidence that the average financial literacy level has a stronger or weaker relation to consumption due to age. The association between the average financial literacy index and consumption levels is stronger (larger magnitude and higher statistical significance) which might be due to the construction of the average financial literacy index. Relying on average financial literacy as a measure would imply a joint financial decision-making process (equal weight for both partners within a couple) which is at odds with our findings from Tables 7 and 10.

We re-estimated the Euler equation for the subsamples defined above. The coefficients are reported in Table 11. We still do not find any evidence for a statistical relationship between financial literacy and consumption growth which is consistent with the results from Table 8. Next, we turn to re-estimating the closed-form equation and the Euler equation if we use a proxy for interest in financial matters.

6.2 Interest in financial literacy

The single wave study on financial literacy also contained a question on whether the respondents thought that the questions were on an interesting subject. This question could serve as a proxy for interest in financial matters. The idea behind conducting this check is that if people are not interested in financial matters in the first place, then the level of financial literacy might be irrelevant for household consumption behaviour. The estimation results of the closed-form equation for non-durable consumption including the interest variable (measured on a 5-point Likert scale) are shown in Table 12. We find that the coefficients of the interest variable for men and women are not statistically significant and that the coefficients do not change compared to the baseline estimations in Table 7. The same holds if we estimate the closed-form equation for total and food consumption. The estimation results for total and food consumption can be found in Tables F9 and F10 respectively in the Appendix.

We conducted the same check for the Euler equation. One can find the estimation results for the Euler equation for non-durable consumption including the interest variable in Table 13. We find that the coefficients of self-assessed financial literacy for men and the interest variable for women are statistically significant, though at the 10%-level. Once we control for whether financial literacy is considered to be an interesting subject, self-assessed financial literacy of men is weakly negatively correlated with consumption growth. Re-estimating the Euler equation using total consumption and food consumption (see Table F10 in Appendix) yields similar results as when the interest is not included in the baseline estimations (Table F4).

Table 12: Closed-form estimations (including interest in FL)

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
SAFL (1-5), w	0.009	(0.015)			-0.012	(0.011)
FL index (0-4), w	0.037*	(0.021)			-0.014	(0.017)
SAFL (1-5), m			0.028	(0.021)	0.031**	(0.014)
FL index (0-4), m			0.037	(0.027)	0.058***	(0.015)
FL: interesting subject?, w	0.009	(0.015)			0.016	(0.012)
FL: interesting subject?, m			-0.008	(0.019)	-0.007	(0.013)
Observations	1,728		1,279		2,501	
R-squared	0.335		0.280		0.311	
Number of clusters	598		434		816	
F-test SAFL=FL=0 (p-value)	0.167		0.117		0.000	
F-test SAFL(m)=SAFL(w)=0 (p-value)					0.058	
F-test FL(m)=FL(w)=0 (p-value)					0.001	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Number of clusters from left to right: 598, 434 and 816. Non-durable consumption has been equivalised and is in logs. Medium education, paid employment and self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively.

Table 13: Consumption growth estimations (including interest in FL)

	(1) Non-durables	(2) se
SAFL (1-5), w	-0.009	(0.007)
FL index (0-4), w	-0.004	(0.010)
SAFL (1-5), m	-0.011	(0.009)
FL index (0-4), m	0.012	(0.011)
FL: interesting subject?, w	0.012	(0.008)
FL: interesting subject?, m	-0.009	(0.008)
Observations	1,252	
R-squared	0.026	
F-test FL(m)=FL(w)=0 (p-value)	0.568	
F-test SAFL(m)=SAFL(w)=0 (p-value)	0.165	
F-test SAFL=FL=0 (p-value)	0.305	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level, 660 clusters). The same covariates and reference categories are used as in previous analyses. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively.

7. Conclusion and Discussion

Does knowing more about financial concepts imply consuming more? Based on our findings we can provide a positive answer for consumption levels. Based on our theoretical model, we predicted a positive relationship between consumption growth and financial literacy and

consumption levels and financial literacy. Our findings are threefold: Firstly, we found a strong positive association between financial literacy and non-durable consumption levels and between self-assessed financial literacy (though less strong) and non-durable consumption levels for men if they are part of a couple. Sensitivity checks showed that the financial literacy of men appears to be relevant for men younger than 65 years and their self-assessed knowledge is relevant for men above 65 years. For single women, we found a weaker association between financial literacy and non-durable consumption which is mainly driven by women above 65 years old. Secondly, after having pooled single and couples' households, we estimated the Euler equation and found no association between consumption growth and (self-assessed) financial literacy. Thirdly, we interacted (self-assessed) financial literacy of men and women within couples and found that differences between the financial literacy level of men and women do not explain any variation in non-durable (and total and food) consumption.

The consumption growth estimates computed by Jappelli and Padula (2017) are much higher than ours: Jappelli and Padula found a positive and statistically significant correlation (of 5.3 percentage points) between consumption growth and financial literacy scores while not taking into account self-assessed financial literacy. In contrast, we did not find evidence for a (negative or positive) correlation between consumption growth and financial literacy— even when taking into account self-assessed financial knowledge. A possible explanation could be that our observation period is longer—it includes five waves within eight years whereas Jappelli and Padula used two waves of consumption data observed within three years. Furthermore, although the observation periods of our study and the one of Jappelli and Padula partially overlap, household consumption in the Netherlands and Italy looked quite differently in the post-crisis period. According to OECD data (OECD, 2018b), aggregate household consumption growth in the Netherlands has been volatile between 2008 and 2014, ranging from 1% to -2% and being relatively stable around 2% from 2014 onwards. The trend for Italy actually looks similar: Between 2008 and 2010, annual consumption growth ranged from -1.6% to 1.2%. In 2012, consumption growth experienced a deep of -4% and from 2014 on, similar to the Netherlands, Italian consumption growth remained positive albeit at least 0.2 percentage points lower than the Dutch. Comparing those figures to our results makes us confident that the estimates of the Euler equation are quite plausible. It is rather surprising that the estimates of Japelli and Padula (2017) for the period of 2008-2010 turn out so high at times with unusually low interest rates.

In the light of Deuflhard et al. (2018) who found that financial literacy is responsible for an increase of 12% (compared to the median interest rate of 2.5% in 2005) in Dutch households' individual returns on savings accounts, our estimates (which ranged from 2.8 per cent till 5.6 per cent) do not deviate much considering that the interest rates dropped significantly since the financial crisis. Naturally, we cannot translate the estimates of Deuflhard et al. directly to our estimates as the latter concern returns to savings and the former encompass returns to savings and other investments. However, the majority of investment activities concern savings accounts: Deuflhard et al. (2018) state that in the DNB Household Survey (DHS), "savings accounts are owned by 82% of all Dutch households" (p.1) and that the ownership rate for directly held stocks is merely 12%.

We would like to stress that we do not claim to estimate causal effects as we do not have suitable instruments for financial literacy to do so. Further research should pay more attention to the endogeneity problem surrounding financial literacy. However, we chose to put the focus in this paper on the theory behind the relation between consumption (growth) and financial literacy and to carefully construct different consumption measures. As briefly mentioned in the results section of this paper, we already conducted some analyses using several instruments (number of books in the household, occupation of mother and father of the respondent) and came to similar conclusions as when applying OLS. As with most studies using consumption data, the period we studied was relatively short, which brings along econometric issues when estimating the Euler equation (Attanasio & Low, 2004). Furthermore, as the first years of our observation period were immediately after the financial crisis and we dispose of self-reported (not observed) consumption data, respondents might have been influenced by the unstable economic climate and under- or overreported expenditures.

Financial literacy and financial education constitute a relevant topic from a policy perspective, especially given that more financial decisions need to be borne by individuals rather than the state. We would advise to effectively financially educate women: In section 6 (Table 10), when analysing consumption levels for different age groups, we found that for single senior women, it could pay off to have a higher financial literacy level. Due to the demographic changes and the gap in life expectancy between men and women, senior women become an increasingly vulnerable group who is often left alone when making difficult household decisions due to the loss of a partner. As we found that the financial literacy level of men is dominant for couples, the shock is arguably even higher when a man leaves the couples household (be it by choice or unfortunate circumstances) leaving the woman alone.

That implies that the education should start already at the beginning of the life cycle so that women could acquire more knowledge and most of all confidence in order to make sound financial decisions jointly with their partner or on their own. It is hard to say though whether the focus should lay more on conveying knowledge or on teaching independence and confidence. We believe that accumulating knowledge also has an impact on one's confidence in itself.

Last but not least, we would like to share some directions for future research. Relaxing the assumption of full certainty as in Lusardi et al. (2017)— but applied to consumption levels rather than wealth inequality— and controlling for time preferences and risk preferences, can help to distinguish between different types of households. This, in turn, could help crystallise the effect of financial literacy on financial decision making even better. One could distinguish then between rational and myopic households, risk-averse and risk-loving households. Furthermore, observing financial literacy and its self-assessment in several waves as in Jappelli and Padula (2017) could enable us to endogenize financial literacy and analyse the returns to investing in financial literacy.

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Appendix

A. Deriving the closed-form solution for consumption using a CRRA utility function

Deriving the Euler equation

Here, we show in detail how to derive the Euler equation using stochastic dynamic programming and subsequently, how to derive the closed-form solution for consumption using a CRRA utility function.

We assume the following:

A_0: initial wealth at the end of period t=0 is equal to zero

For the intertemporal budget constraint to hold, we need the assumption of no bequest motives: $A_T = 0$, where T denotes the last period.

c_t: consumption in period t

ρ is the rate of time preference

$u(c_t)$: utility from consumption, later specified as CRRA utility function

$r(\varphi)$: real rate of return as a strictly increasing and concave function of the financial literacy level. Financial literacy is exogenously given in this setting.

y: income level - assumed to be constant

We formulate the following value function

$$V_0(A_0) = \max_{c_t} \sum_{t=1}^{T} (1+\rho)^{1-t} u(c_t) \tag{A.1}$$

subject to the dynamic budget constraint

$$A_t = \big(1 + r(\varphi)\big)A_{t-1} + y_t - c_t, \; t=1, \ldots, T \tag{A.2}$$

Which, for the purpose of the following calculations can be rewritten as

$$A_{t+1} = \big(1 + r(\varphi)\big)A_t + y_t - c_t$$

Or

$$c_t = \big(1 + r(\varphi)\big)A_t + y_t - A_{t+1} \tag{A.3}$$

Rewriting the maximization problem in Bellman equation form yields

$$V_t(A_t) = \max_{\{c_t\}} \{u(c_t) + (1+\rho)^{1-t} V_{t+1}(A_{t+1})\} \tag{A.4}$$

Or

$$V_t(A_t) = \max_{\{A_{t+1}|A_t\}} \{u\left(\left(1 + r(\varphi)\right)A_t + y_t - A_{t+1}\right) + (1+\rho)^{1-t} V_{t+1}(A_{t+1})\} \tag{A.5}$$

The first-order condition for a maximum with respect to A_{t+1} is:

$$-u'(c_t) + (1+\rho)^{1-t} \frac{\partial V_{t+1}(A_{t+1})}{\partial A_{t+1}} = 0 \tag{A.6}$$

Or

$$u'(c_t) = (1+\rho)^{1-t} \frac{\partial V_{t+1}(A_{t+1})}{\partial A_{t+1}} \tag{A.7}$$

The Envelope Theorem implies:

$$\frac{\partial V_t(A_t)}{\partial A_t} = u'(c_t)\left(1 + r(\varphi)\right). \tag{A.8}$$

Iterating the above equation forward one period yields:

$$\frac{\partial V_{t+1}(A_{t+1})}{\partial A_{t+1}} = u'(c_{t+1})\left(1 + r(\varphi)\right) \tag{A.9}$$

Combining equations (8) and (9) results in the Euler equation:

$$u'(c_t) = \frac{\left(1 + r(\varphi)\right)}{(1+\rho)} u'(c_{t+1}) \tag{A.10}$$

This is the result for two subsequent periods t and $\tau = t + 1$. If we want to expand the analysis to other values of $\tau = t, .., T$, we will arrive at

$$u'(c_t) = \left(\frac{1+r}{1+\rho}\right)^{\tau - t} u'(c_\tau), \tau = t, \dots, T \tag{A.11}$$

In order to obtain a closed form solution for c_t, we specify utility as a general CRRA utility function $U(c_t) = \frac{c_t^{1-\gamma}}{1-\gamma}$ with $\frac{dU(c_t)}{dc_t} = c_t^{-\gamma}$ (where γ is the coefficient of relative risk aversion with $\gamma \neq 0$.

We can rewrite the Euler equation to

$$c_t^{-\gamma} = \left(\frac{1+r}{1+\rho}\right)^{\tau - t} c_\tau^{-\gamma} \tag{A.12}$$

Taking logs on both sides yield

$$\gamma \log(c_\tau) = \log\left(\left(\frac{1+r}{1+\rho}\right)^{\tau-t} c_t^\gamma\right) \tag{A.13}$$

Or

$$\log(c_\tau) = \frac{1}{\gamma}\log\left(\left(\frac{1+r}{1+\rho}\right)^{\tau-t} c_t^\gamma\right) \tag{A.14}$$

Raising both sides to the power of *e*:

$$\mathrm{c}_\tau = \left(\left(\frac{1+r}{1+\rho}\right)^{\tau-t} c_t^\gamma\right)^{\frac{1}{\gamma}} \tag{A.15}$$

Or

$$\mathrm{c}_\tau = \left(\frac{1+r}{1+\rho}\right)^{\frac{\tau-t}{\gamma}} c_t \tag{A.16}$$

Equation (16) can now be substituted into the intertemporal budget constraint.

Observations about the Euler equation for two subsequent periods

In what follows, we will comment on the properties of the Euler equation for two subsequent periods.

Note, when $\tau = t + 1$, for two subsequent periods

$$\mathrm{c}_{t+1} = \left(\frac{1+r}{1+\rho}\right)^{\frac{1}{\gamma}} c_t \tag{A.17}$$

Dividing both sides by c_t and rewriting yields

$$\frac{\mathrm{c}_{t+1}}{c_t} = \left(\frac{1+r}{1+\rho}\right)^{\frac{1}{\gamma}} \tag{A.18}$$

Taking logs on both sides:

$$(\log(c_{t+1}) - \log(c_t)) = \frac{1}{\gamma}\log\left(\frac{1+r}{1+\rho}\right) \tag{A.19}$$

Or

$$\Delta \log(c_t) = \frac{1}{\gamma}\log\left(\frac{1+r}{1+\rho}\right) = \sigma \log\left(\frac{1+r}{1+\rho}\right) \cong \sigma(r-\rho) \tag{A.20}$$

Where $\Delta \log(c_t) = \log(c_{t+1}) - \log(c_t)$ and $\frac{1}{\gamma} = \sigma$. σ is the intertemporal elasticity of substitution (IES). The percentage change in consumption is positive if $r > \rho$ and the marginal effect on the slope (steepness):

$\frac{\partial \Delta \log(c_t)}{\partial r} = \sigma * \frac{1}{1+r} > 0 \; for \; r > 0$ and $\sigma > 0$.

The steepness of the slope is increasing in r for positive r and a positive intertemporal elasticity of substitution. Hence, the highly literate have a steeper consumption profile than individuals with low literacy.

Deriving the closed-form solution (substituting Euler equation into intertemporal budget constraint)

Now, let us return to the derivation of the closed-form solution. The intertemporal budget constraint is given by

$$\sum_{\tau=t}^{L} \frac{c_\tau}{(1+r)^{\tau-t}} = (1+r)A_{t-1} + y \sum_{\tau=t}^{L} \frac{1}{(1+r)^{\tau-t}} \tag{A.21}$$

It can be shown by backward induction that this constraint only holds when $A_L = 0$, hence that there are no bequest motives.

Substitute equation (16) in equation (21):

$$c_t \sum_{\tau=t}^{L} \frac{\left(\frac{1+r}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}}{(1+r)^{\tau-t}} = (1+r)A_{t-1} + \sum_{\tau=t}^{L} \frac{y_\tau}{(1+r)^{\tau-t}} \tag{A.22}$$

where

$$\sum_{\tau=t}^{L} \frac{\left(\frac{1+r}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}}{(1+r)^{\tau-t}} = \sum_{\tau=t}^{L} \left(\frac{1+r}{1+\rho}\right)^{\frac{\tau-t}{\gamma}} (1+r)^{-(\tau-t)} = \sum_{\tau=t}^{L} (1+r)^{\frac{\tau-t}{\gamma}-(\tau-t)} \left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}$$
$$= \sum_{\tau=t}^{L} (1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}} \left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}$$

In order to elicit the pure impact of financial literacy on consumption, we can assume that household income is constant over time. Rewriting equation (22) yields

$$c_t \sum_{\tau=t}^{L} (1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}} \left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}} = (1+r)A_{t-1} + y \sum_{\tau=t}^{L} \left(\frac{1}{1+r}\right)^{\tau-t} \tag{A.23}$$

Dividing both sides by $\sum_{\tau=t}^{L}(1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}}\left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}$ yields

$$c_t = \Lambda^{-1}\left((1+r)A_{t-1} + y\frac{1+r-(\frac{1}{1+r})^{L-t}}{r}\right) \tag{A.24}$$

Where $\Lambda := \sum_{\tau=t}^{L}(1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}}\left(\frac{1}{1+\rho}\right)^{\frac{\tau-t}{\gamma}}$

For our analysis, we assume that $\rho = 0$, so that the closed form solution for consumption simplifies to:

$$c_t = \left(\sum_{\tau=t}^{L}(1+r)^{\frac{(1-\gamma)(\tau-t)}{\gamma}}\right)^{-1}\left((1+r)A_{t-1} + y\frac{1+r-(1+r)^{t-L}}{r}\right) \tag{A.25}$$

To check whether the closed-form solution is increasing in r implying no intersection points for consumption profiles across different levels of r, we compute the first-order partial derivative with respect to r. For simplicity, we compute the partial derivative for $\boldsymbol{t = 1}$ (see equation (A.26)):

$$\begin{aligned}\frac{\partial c_1}{\partial r} = &-\frac{y(-\left(\frac{1}{1+r}\right)^{L-1}+r+1)(\sqrt[\gamma]{1+r}-r-1)}{r^2(1+r)((1+r)^{\left(\frac{(1-\gamma)L}{\gamma}\right)}-1)} \\ &-\frac{(1-\gamma)Ly\left(-\left(\frac{1}{1+r}\right)^{L-1}+r+1\right)(\sqrt[\gamma]{1+r}-r-1)(1+r)^{\frac{(1-\gamma)L}{\gamma}-2}}{\gamma r\left((1+r)^{\left(\frac{(1-\gamma)L}{\gamma}\right)}-1\right)^2} \\ &+\frac{y\left((L-1)\left(\frac{1}{1+r}\right)^{L}+1\right)(\sqrt[\gamma]{1+r}-r-1)}{r(1+r)((1+r)^{\left(\frac{(1-\gamma)L}{\gamma}\right)}-1)} \\ &+\frac{y\left(-\left(\frac{1}{1+r}\right)^{L-1}+r+1\right)\left(\frac{(1+r)^{\frac{1}{\gamma}-1}}{\gamma}-1\right)}{r(1+r)((1+r)^{\left(\frac{(1-\gamma)L}{\gamma}\right)}-1)} \\ &-\frac{y\left(-\left(\frac{1}{1+r}\right)^{L-1}+r+1\right)(\sqrt[\gamma]{1+r}-r-1)}{r(1+r)^2((1+r)^{\left(\frac{(1-\gamma)L}{\gamma}\right)}-1)}\end{aligned} \tag{A.26}$$

B. Household consumption and consumption growth

Household consumption (levels)

Table B1: Wording of questions in LISS panel (time use and consumption module)

How many euros does your household spend on average each month on:	**Couples or singles with children living at home**	**Singles**
mortgage: interest plus amortization (what matters is the gross amount, so before tax deduction)	bf09a66; bf10b66; bf12c66; bf15d66; bf17e66	bf09a79; bf10b79; bf12c79; bf15d79; bf17e79
rent (NOT including costs of gas and electricity)	bf09a67; bf10b67; bf12c67; bf15d67; bf17e67	bf09a80; bf10b80; bf12c80; bf15d80; bf17e80
general utilities (heating, electricity, water, telephone, Internet, etc; but NO insurances)	bf09a68; bf10b68; bf12c68; bf15d68; bf17e68	bf09a81; bf10b81; bf12c81; bf15d81; bf17e81
transport and means of transport *(public transport; own car: gasoline/diesel and maintenance, but NOT insurances or the purchase of e.g. a car or [motor] bike) **	*bf09a69; bf10b69; bf12c69; bf15d69; bf17e69*	*bf09a82; bf10b82; bf12c82; bf15d82; bf17e82*
insurances (home insurance, car insurance, health insurance, etc.)	bf09a70; bf10b70; bf12c70; bf15d70; bf17e70	bf09a83; bf10b83; bf12c83; bf15d83; bf17e83
children's daycare (day care center, out-of-school supervision, guest parents, homework guidance, etc.)	bf09a71; bf10b71; bf12c71; bf15d71; bf17e71	
alimony and financial support for children not (or no longer) living at home	bf09a72; bf10b72; bf12c72; bf15d72; bf17e72	bf09a85; bf10b85; bf12c85; bf15d85; bf17e85
debts and loans (but NOT the mortgage)	bf09a73; bf10b73; bf12c73; bf15d73; bf17e73	bf09a86; bf10b86; bf12c86; bf15d86; bf17e86
daytrips and holidays with the whole family or part of the family *(flight tickets, hotel, restaurant bills for the family, etc.) **	*bf09a74; bf10b74; bf12c74; bf15d74; bf17e74*	
expenditure on cleaning the house or maintaining the garden *	*bf09a75; bf10b75; bf12c75; bf15d75; bf17e75*	*bf09a87; bf10b87; bf12c87; bf15d87; bf17e87*
eating at home *(food, drinks, candy, etc.) **	*bf09a76; bf10b76; bf12c76; bf15d76; bf17e76*	*bf09a88; bf10b88; bf12c88; bf15d88; bf17e88*
other household expenditure *(but no expenditure meant only for yourself or another specific person in your household) **	*bf09a77; bf10b77; bf12c77; bf15d77; bf17e77*	*bf09a89; bf10b89; bf12c89; bf15d89; bf17e89*
*Personal expenditures: indicate how many Euro you (personally) spent per month on average on other personal expenditures for yourself in the past 12 months? For example, you can think of food and drinks outside the house, cigarettes and other tobacco products, clothing, personal care products and services, leisure time expenditure (film, theatre, hobbies, sports activities, photography, books, etc.), further schooling and donation or gifts**	*bf09a104; bf10b104; bf12c104; bf15d131+bf15d134; bf17e131+bf17e134*	*bf09a104; bf10b104; bf12c104; bf15d131+bf15d134; bf17e131+bf17e134*

** indicates that item has been used to compute household consumption*

Non-durable consumption

$$Non-durable\ consumption = \frac{1}{\sqrt{household\ size}}[non-assignable + \sum assignable\ consumption] \quad (B.1)$$

Non-durable consumption is an aggregate of the following components:

- eating at home (food, drinks, candy, etc.),
- transport and means of transport (public transport; own car: gasoline/diesel and maintenance, but not insurances or purchase of a car or (motor)bike),
- daytrips and holidays with the entire family or part of the family (flight tickets, hotel, restaurant bills for the family, etc.)
- expenditures on cleaning the house or maintaining the garden
- other household expenditure (but not expenditure meant only for yourself or another specific person in your household)
- assignable consumption for every household member

For the first three waves (years 2009, 2010 and 2012), assignable consumption was an aggregate of the following components: food and drinks outside the house, cigarettes and other tobacco products, clothing, medical expenses (not covered by health insurance), personal care products and services, leisure time expenditure (film, theatre, hobbies, sports activities, photography, books, etc.), further schooling and donation or gifts. Respondents were asked to indicate how much, on average, they spend per month on each of the aforementioned categories. From 2015 on (the last two waves), however, total assignable expenditures are being asked without splitting the categories. Furthermore, medical expenditures are asked in a separate question from 2015 on. We had to take this into account when computing consumption growth to prevent our results to be driven by a questionnaire effect.

Total consumption

Total consumption is an aggregate of non-durable and durable consumption of all household members (including children < 25 who filled in the questionnaires). The categories of total household consumption partially overlap with the categories used to compute non-durable consumption. Total household consumption consists of the following categories:

- mortgage (interest plus amortisation)
- rent (not including costs of gas and electricity)
- general utilities
- insurances
- children's day care
- alimony and financial support for children not living at home
- debts and loans (but not mortgage)

- eating at home (food, drinks, candy, etc.),
- transport and means of transport (public transport; own car: gasoline/diesel and maintenance, but not insurances or purchase of a car or (motor)bike),
- daytrips and holidays with the entire family or part of the family (flight tickets, hotel, restaurant bills for the family, etc.)
- expenditures on cleaning the house or maintaining the garden
- other household expenditure (but not expenditure meant only for yourself or another specific person in your household)
- assignable consumption for every household member

Consumption growth

Consumption growth has been computed using the following commonly used formula as a starting point where n denotes the number of years elapsed since year t:

$$total\ consumption_{t+n} = total\ consumption_t (1 + growth\ rate)^n \tag{B.2}$$

Taking logs on both sides and using the approximation $\ln(1 + growth\ rate) \approx growth\ rate$ gives the following simple expression for annualised consumption growth

$$growth\ rate = \frac{1}{n}(\ln(total\ consumption_{t+n}) - \ln(total\ consumption_t)) \tag{B.3}$$

As the consumption data we analysed was not available for subsequent years but for 2009, 2010, 2012, 2015 and 2017, we had to compute consumption growth rates using this method. To circumvent the questionnaire effect concerning assigned consumption as described earlier, we excluded consumption growth for the year 2015 and for the year 2017, we only considered the difference between 2015 and 2017.

C. Questions on financial literacy

Question on self-assessed financial literacy

How would you score your understanding of financial matters (on a scale of 1 to 7, where 1 means 'very poor' and 7 means 'very good')?

The 'Go back' button was not offered with the following question, so that the respondent was not able to return to previous questions in the questionnaire. Respondents can still use the browser to go back in the questionnaire.

Question on interest compounding (Q1)
Suppose you have 100 euros on a savings account and the interest is 2% per year.
How much do you think you will have on the savings account after five years, assuming that you leave all your money on this savings account: more than 102 euros, exactly 102 euros, less than 102 euros?

1 more than 102 euros
2 exactly 102 euros
3 less than 102 euros
4 I don't know
5 I would rather not say

Question on inflation (Q2)
Suppose that the interest on your savings account is 1% per year and that inflation amounts to 2% per year. After 1 year, would you be able to buy more, exactly the same, or less than you could today with the money on that account?

1 more than today
2 exactly the same as today
3 less than today
4 I don't know
5 I would rather not say

Question on risk diversification (Q3)
A share in a company usually offers a more certain return than an investment fund that only invests in shares.

1 true
2 not true
3 I don't know
4 I would rather not say

Question on relation between bond prices and interest rate (Q4)
If the interest rate goes up, what should happen to bond prices?

1 they should increase
2 they should decrease
3 they should stay the same
4 none of the above
5 I don't know
6 I would rather not say

The first question tests the knowledge on interest compounding – a simple setting that does not require computing skills but is concerned with understanding the concept of earning interest on interest. The second question is a question on inflation and does not require computation skills either but understanding the difference between real and nominal interest rate. The third question tests the knowledge on risk diversification – a more advanced financial concept and the fourth question tests knowledge on the relationship between bond prices and interest rates.

D. More descriptive statistics on financial literacy

Table D1: Percentage shares of correct answers for each FL question by age group (n=2620)

	Q1 Interest	Q2 Inflation	Q3 Risk	Q1 Bonds
<40 years (n=579)				
Correct	88.26	76.86	43.87	19.86
Incorrect	5.35	8.46	13.47	26.08
DK	4.49	12.09	40.07	51.64
Refuse	1.90	2.59	2.59	2.42
40-64 years (n=1282)				
Correct	91.19	79.10	45.48	19.11
Incorrect	5.23	11.23	16.22	36.66
DK	2.96	8.58	37.05	43.21
Refuse	0.62	1.09	1.25	1.01
65+ years (n=759)				
Correct	89.72	81.42	36.50	18.31
Incorrect	5.67	9.88	19.76	38.47
DK	3.95	8.04	43.08	43.08
Refuse	0.66	0.66	0.66	0.13

Notes: We test for age differences for each question using the seemingly unrelated regression model (SUR) with clustered standard errors at the individual level. For the first question, the differences between men and women are not statistically significant and for the remaining questions— at the 0.1%-level. The test results are available upon request by the corresponding author.

Table D1 summarizes the share of answering type (correct, incorrect, DK or refuse) by age group. For every age group, the share of correct answers was the highest for the first question, followed by the second, third and fourth. The share of "don't knows" is lowest for the first question and highest for the last question – with the exception of the old age group. For seniors, the share of "don't know" answers was similar for the third and the fourth question. The largest difference across age categories can be observed for the third financial literacy question.

We also examined the share of correct (incorrect etc.) answers by question by education categories – see Table D2. We can observe that financial literacy is increasing in education level and that the share of "don't knows" is becoming smaller for individuals with a higher education level.

Table D2: Cell percentages by education level and answer type (n=2620)

	Q1 Interest	Q2 Inflation	Q3 Risk	Q4 Bonds
Low (n=963)				
Correct	84.01	69.47	27.10	10.49
Incorrect	8.31	14.95	19.63	34.89
DK	6.33	13.50	51.40	53.37
Refuse	1.35	2.08	1.87	1.25
Medium (n=843)				
Correct	91.22	81.02	44.60	20.17
Incorrect	5.34	8.54	15.54	33.10
DK	2.49	9.25	38.32	45.31
Refuse	0.95	1.19	1.54	1.42
High (n=812)				
Correct	96.31	89.16	58.62	28.08
Incorrect	1.97	6.40	14.29	36.70
DK	1.35	3.94	26.48	34.73
Refuse	0.37	0.49	0.62	0.49

Notes: We test for differences between education levels for each question using the seemingly unrelated regression model (SUR) with clustered standard errors at the individual level. For all questions, the differences between men and women are significant at the 0.1%-level. The test results are available upon request by the corresponding author.

E. Descriptive statistics of all variables included in the regressions (final pooled sample)

Table E1: Variable definitions

Variable	Description
Food consumption (in Euro)	Self-reported monthly in-house food expenditures at the household level (in Euro)
Nondurable consumption (in Euro)*	Self-reported monthly non-durable expenditures at the household level (in Euro)
Total consumption (in Euro)*	Self-reported monthly total expenditures at the household level (in Euro)
Equivalised food consumption (in logs)	Logarithm of equivalised food consumption at the household level
Equivalised nondurable consumption (in logs)	Logarithm of equivalised nondurable consumption at the household level
Equivalised total consumption (in logs)	Logarithm of equivalised total consumption at the household level
Δlog(food consumption)	Consumption growth (differencing the logarithm of equivalised food consumption)
Δlog(nondurable consumption)	Consumption growth adjusted for the trend-break (differencing the logarithm of equivalised nondurable consumption)
Δlog(total consumption)	Consumption growth adjusted for the trend-break (differencing the logarithm of equivalised total consumption)
FL index	Simple financial literacy index based on the number of questions answered correctly (out of 4) at the individual level.
SAFL	Self-assessed financial literacy on a 5-point Likert scale (very poor - very good) at the individual level.
Subjective health	Self-reported health based on one question on a 5-point Likert scale (poor-excellent) at the individual level
Healthy BMI	Measure for objective health. =1 if body mass index (BMI) of respondent is healthy (18<BMI<30); =0 if BMI is unhealthy (<19 or >29) at the individual level.
Low education	Primary school/intermediate secondary education, binary
Medium education	Higher secondary education/ intermediate vocational education, binary (reference category)
High education	Higher vocational education/ university, binary
Married	Respondent is married, binary (reference category)
Divorced/Separated	Respondent is divorced or separated, binary
Widow/Widower	Respondent is widowed, binary
Never been married	Respondent never has been married, binary
Income quintiles	Five dummies for each quintile of the total income distribution (based on net household income). Reference category is the third income quintile.
# of (Self-)Employed (0-2)	Occupation: Number of (Self-)Employed adults in household
# of Job-seekers (0-2)	Occupation: Number of Job-seekers adults in household

Table E1 (*continued*)

Variable	Description
# of Students (0-2)	Occupation: Number of Students in household
# of Volunteers/Homemakers (0-2)	Occupation: Number of Volunteers/Homemakers in household
# of Retirees (0-2)	Occupation: Number of Retirees in household
# of Members with (partial) work disability (0-2)	Occupation: Number of adults with (partial) work disability in household
Something else (0-2)	Occupation: Number of (Self-)Employed adults in household
Self-owned dwelling	Self-owned dwelling, binary (reference category)
Rental dwelling	Rental dwelling, binary
Cost-free dwelling	Cost-free dwelling, binary
Household head is male	Household head is male, binary
Children living at home	Children (<25 years) are living at home, binary
Assets quintiles	Assets are savings and the balance on the current account that are on the name of either of the household head and/or his or her partner. Five dummies for each quintile of the total assets distribution. Reference category is the third assets quintile.
Interest in FL	Question from the Single wave study about whether the respondent found the questions on FL interesting (individual level) at a 5-point Likert scale.

Notes: * for more details on the composition of those variables, see Appendix B.

Table E2: Summary statistics

	Variable	Obs.	Mean	Sd	Min	Max
Consumption	Food consumption (in Euro)	5508	303.052	206.959	1	4500
	Non-durable consumption (in Euro)	5508	1048.844	714.378	38	7445
	Total consumption (in Euro)	5508	1968.288	1001.154	20	8360
	Equivalised food consumption (in logs)	5508	5.258	0.670	0	7.719
	Equivalised non-durable consumption (in logs)	5508	6.524	0.583	3.638	8.294
	Equivalised total consumption (in logs)	5508	7.224	0.554	2.446	8.639
	Delta log food consumption	2755	0.001	0.484	-4.200	2.708
	Delta log total consumption	2755	-0.012	0.417	-4.271	3.367
	Delta log non-durable consumption	2755	-0.006	0.370	-4.192	2.325
Financial literacy	SAFL (1-5), w	4229	3.633	1.211	1	5
	SAFL (1-5), m	3780	4.086	1.040	1	5
	FL index (0-4), w	4229	2.106	0.960	0	4
	FL index (0-4), m	3780	2.641	0.982	0	4
Health	subjective health, w	4229	2.974	0.735	1	5
	subjective health, m	3780	3.047	0.743	1	5
	Healthy BMI (=1), w	4229	0.834	0.372	0	1
	Healthy BMI (=1), m	3780	0.868	0.339	0	1
Demographics (individual level)	Age, w	4229	56.104	15.190	19	92
	Age, m	3780	57.040	14.778	18	93
	Low education (=1), w	4229	0.424	0.494	0	1
	Low education (=1), m	3780	0.322	0.467	0	1
	Medium education (=1), w	4229	0.289	0.453	0	1
	Medium education (=1), m	3780	0.324	0.468	0	1
	High education (=1), w	4229	0.287	0.452	0	1
	High education (=1), m	3780	0.354	0.478	0	1
	Married (=1), w	4229	0.526	0.499	0	1
	Married (=1), m	3780	0.591	0.492	0	1
	Divorced/Separated (=1), w	4229	0.148	0.355	0	1
	Divorced/Separated (=1), m	3780	0.135	0.342	0	1
	Widow	4229	0.109	0.312	0	1
	Widower	3780	0.056	0.230	0	1
	Never been married, w	4229	0.216	0.412	0	1
	Never been married, m	3780	0.218	0.413	0	1
Demographics (household level)	Household head is male	5508	0.645	0.479	0	1
	1st Income quintile	1202	803.079	432.459	0	1250
	2nd Income quintile	1071	1545.044	152.086	1252	1750
	3rd Income quintile	1095	2055.465	172.574	1751	2380
	4th Income quintile	1091	2753.125	222.690	2385	3171
	5th Income quintile	1049	4776.128	12201.618	3173	285759
	# of (Self-)Employed (0-2)	5508	0.665	0.730	0	2

Table E2 (*continued*)

	Variable	Obs.	Mean	Sd	Min	Max
	# of Job-seekers (0-2)	5508	0.050	0.223	0	2
	# of Students (0-2)	5508	0.021	0.149	0	2
	# of Volunteers/Homemakers (0-2)	5508	0.162	0.384	0	2
	# of Retirees (0-2)	5508	0.465	0.670	0	2
	# of Members with (partial) work disability (0-2)	5508	0.079	0.273	0	2
	Something else (0-2)	5508	0.012	0.115	0	2
	Self-owned dwelling (=1)	5508	0.624	0.484	0	1
	Rental dwelling (=1)	5508	0.367	0.482	0	1
	Cost-free dwelling (=1)	5508	0.009	0.094	0	1
	Children living at home (=1)	5508	0.176	0.381	0	1
Controls (additional analyses)	1st Assets quintile	735	-1094.834	5428.213	-80000	50
	2nd Assets quintile	751	2124.075	1536.845	54	5000
	3rd Assets quintile	674	10893.880	3762.140	5005	18826
	4th Assets quintile	728	31920.113	9625.092	18956	50000
	5th Assets quintile	714	165112.356	445884.086	50086	8135049
	FL: interesting subject?, w	4229	3.105	1.269	1	5
	FL: interesting subject?, m	3780	3.501	1.113	1	5

F. **Estimation results**

Table F1: Closed form consumption estimations (non-durable consumption)

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
FL index (0-4), w	0.040*	(0.021)			-0.009	(0.016)
FL index (0-4), m			0.035	(0.026)	0.056***	(0.015)
SAFL (1-5), w	0.011	(0.015)			-0.008	(0.011)
SAFL (1-5), m			0.026	(0.021)	0.028**	(0.014)
Low education dummy, w	-0.029	(0.049)			0.048	(0.033)
High education dummy, w	0.064	(0.046)			0.049	(0.036)
Low education dummy, m			-0.050	(0.057)	-0.004	(0.035)
High education dummy, m			0.024	(0.060)	0.077**	(0.032)
subjective health, w	-0.006	(0.023)			0.005	(0.016)
Healthy BMI (=1), w	0.037	(0.042)			0.014	(0.036)
subjective health, m			-0.006	(0.033)	0.036**	(0.016)
Healthy BMI (=1), m			-0.034	(0.052)	0.033	(0.045)
Married (=1), w	0.453**	(0.210)			-0.061	(0.048)
Divorced/Separated (=1), w	-0.040	(0.052)			0.064	(0.113)
Widow	0.050	(0.063)			0.347**	(0.153)
Married (=1), m			-0.278**	(0.130)		
Divorced/Separated (=1), m			-0.028	(0.053)	-0.090	(0.112)
Widower			0.009	(0.083)	-0.367	(0.290)
wave 1	0.230***	(0.044)	0.220***	(0.048)	0.134***	(0.034)
wave 2	0.190***	(0.043)	0.155***	(0.044)	0.107***	(0.032)
wave 3	0.152***	(0.044)	0.161***	(0.045)	0.112***	(0.032)
wave 4	0.013	(0.042)	-0.033	(0.042)	-0.041	(0.033)
1st quintile income	-0.431***	(0.058)	-0.401***	(0.071)	0.017	(0.070)
2nd quintile income	-0.128***	(0.047)	-0.185***	(0.057)	-0.099**	(0.047)
4th quintile income	0.188***	(0.060)	0.220***	(0.063)	0.204***	(0.035)
5th quintile income	0.143	(0.102)	0.272***	(0.099)	0.407***	(0.040)
# of Job-seekers (0-2)	-0.019	(0.078)	0.042	(0.097)	0.111**	(0.050)
# of Students (0-2)	-0.265**	(0.131)	0.146	(0.151)	-0.062	(0.088)
# of Volunteers/Homemakers (0-2)	-0.121	(0.080)	0.152	(0.136)	-0.025	(0.036)
# of Retirees (0-2)	-0.083	(0.081)	-0.033	(0.113)	0.023	(0.034)
# of Members with (partial) work disability (0-2)	-0.103	(0.082)	0.102	(0.085)	-0.104**	(0.050)
Something else (0-2)	-0.070	(0.222)	0.237	(0.187)	-0.040	(0.079)
Rental dwelling (=1)	-0.156***	(0.042)	-0.104**	(0.048)	-0.063*	(0.036)
Cost-free dwelling (=1)	-0.180	(0.144)	0.208	(0.160)	-0.372*	(0.226)
Children living at home (=1)	-0.136**	(0.062)	-0.297***	(0.093)	-0.213***	(0.039)
Household head is male					-0.006	(0.045)
Observations	1,728		1,279		2,501	
R-squared	0.335		0.280		0.310	
Number of clusters	598		434		816	
F-test SAFL=FL=0 index (p-value)	0.109		0.131		0.000	
F-test SAFL (p-value)					0.102	
F-test FL index (p-value)					0.001	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Non-durable consumption has been equivalised and is in logs. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F2: Closed-form consumption estimations (total consumption)

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
FL index (0-4), w	0.029**	(0.013)			0.028	(0.022)
FL index (0-4), m			0.013	(0.016)	0.025	(0.018)
SAFL (1-5), w	-0.010	(0.010)			-0.014	(0.014)
SAFL (1-5), m			-0.001	(0.012)	0.032*	(0.017)
Low education dummy, w	-0.019	(0.032)			0.040	(0.041)
High education dummy, w	0.046	(0.031)			0.009	(0.052)
Low education dummy, m			-0.048	(0.038)	0.063	(0.043)
High education dummy, m			-0.009	(0.035)	0.057	(0.042)
subjective health, w	-0.000	(0.016)			0.010	(0.021)
Healthy BMI (=1), w	0.010	(0.028)			-0.003	(0.047)
subjective health, m			0.020	(0.018)	-0.004	(0.024)
Healthy BMI (=1), m			-0.068*	(0.036)	0.067	(0.053)
Married (=1), w	0.174	(0.257)			0.001	(0.070)
Divorced/Separated (=1), w	0.005	(0.032)			-0.022	(0.222)
Widow	-0.006	(0.040)			0.276	(0.252)
Married (=1), m			-0.071	(0.121)		
Divorced/Separated (=1), m			0.099***	(0.034)	-0.025	(0.217)
Widower			0.111**	(0.051)	-0.362	(0.291)
wave 1	0.066**	(0.026)	0.090***	(0.032)	0.114**	(0.048)
wave 2	0.054**	(0.025)	0.052*	(0.029)	0.056	(0.051)
wave 3	0.040	(0.025)	0.073***	(0.026)	0.096*	(0.049)
wave 4	0.001	(0.026)	-0.003	(0.026)	-0.012	(0.049)
1st quintile income	-0.333***	(0.038)	-0.325***	(0.040)	0.040	(0.079)
2nd quintile income	-0.118***	(0.032)	-0.142***	(0.032)	-0.060	(0.064)
4th quintile income	0.193***	(0.045)	0.177***	(0.040)	0.197***	(0.045)
5th quintile income	0.248***	(0.088)	0.223***	(0.076)	0.407***	(0.049)
# of Job-seekers (0-2)	-0.071	(0.061)	0.012	(0.063)	0.133*	(0.069)
# of Students (0-2)	-0.120	(0.099)	-0.077	(0.093)	-0.144	(0.163)
# of Volunteers/Homemakers (0-2)	-0.107**	(0.052)	0.082	(0.085)	0.047	(0.040)
# of Retirees (0-2)	-0.140**	(0.055)	-0.003	(0.066)	0.090**	(0.037)
# of Members with (partial) work disability (0-2)	-0.033	(0.043)	0.024	(0.047)	-0.110	(0.078)
Something else (0-2)	0.018	(0.084)	-0.016	(0.130)	0.068	(0.072)
Rental dwelling (=1)	0.012	(0.028)	0.020	(0.030)	0.076*	(0.040)
Cost-free dwelling (=1)	-0.173	(0.137)	0.045	(0.160)	-0.193	(0.414)
Children living at home (=1)	-0.227***	(0.044)	-0.265***	(0.050)	-0.242***	(0.057)
Household head is male					-0.125**	(0.054)
Observations	1,728		1,279		2,501	
R-squared	0.378		0.349		0.147	
Number of clusters	598		434		816	
F-test SAFL=FL=0 index (p-value)	0.085		0.708		0.024	
F-test SAFL (p-value)					0.148	
F-test FL index (p-value)					0.083	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Total household consumption has been equivalised and is in logs. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F3: Closed-form consumption estimations (food consumption)

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
FL index (0-4), w	0.064***	(0.023)			-0.041*	(0.021)
FL index (0-4), m			0.085***	(0.029)	0.059***	(0.021)
SAFL (1-5), w	0.008	(0.019)			-0.010	(0.014)
SAFL (1-5), m			0.016	(0.024)	0.018	(0.019)
Low education dummy, w	-0.016	(0.059)			-0.025	(0.043)
High education dummy, w	-0.024	(0.052)			0.001	(0.043)
Low education dummy, m			-0.118*	(0.071)	-0.032	(0.045)
High education dummy, m			0.029	(0.065)	0.085**	(0.041)
subjective health, w	0.007	(0.026)			0.008	(0.020)
Healthy BMI (=1), w	0.003	(0.053)			-0.006	(0.045)
subjective health, m			-0.033	(0.037)	0.025	(0.021)
Healthy BMI (=1), m			0.016	(0.067)	0.057	(0.056)
Married (=1), w	0.347***	(0.127)			-0.020	(0.061)
Divorced/Separated (=1), w	0.012	(0.059)			-0.031	(0.129)
Widow	0.108	(0.076)			0.357*	(0.194)
Married (=1), m			-0.009	(0.230)		
Divorced/Separated (=1), m			0.004	(0.065)	0.112	(0.119)
Widower			-0.017	(0.104)	-0.142	(0.450)
wave 1	0.074	(0.049)	-0.040	(0.068)	0.069	(0.043)
wave 2	0.005	(0.049)	-0.017	(0.060)	0.053	(0.040)
wave 3	0.010	(0.049)	-0.057	(0.059)	0.072*	(0.039)
wave 4	0.033	(0.046)	-0.115*	(0.061)	-0.004	(0.040)
1st quintile income	-0.326***	(0.064)	-0.317***	(0.087)	-0.055	(0.080)
2nd quintile income	-0.084	(0.055)	-0.127*	(0.072)	-0.133**	(0.064)
4th quintile income	0.153**	(0.067)	0.170**	(0.074)	0.124***	(0.046)
5th quintile income	-0.037	(0.108)	0.132	(0.116)	0.232***	(0.052)
# of Job-seekers (0-2)	0.067	(0.090)	0.042	(0.104)	0.093*	(0.056)
# of Students (0-2)	0.008	(0.119)	0.192	(0.186)	0.068	(0.109)
# of Volunteers/Homemakers (0-2)	-0.054	(0.107)	0.289*	(0.150)	-0.005	(0.044)
# of Retirees (0-2)	0.064	(0.102)	0.091	(0.103)	0.032	(0.041)
# of Members with (partial) work disability (0-2)	-0.021	(0.079)	0.092	(0.110)	-0.025	(0.062)
Something else (0-2)	-0.189	(0.214)	0.459	(0.328)	-0.020	(0.064)
Rental dwelling (=1)	-0.095*	(0.049)	0.008	(0.061)	-0.012	(0.051)
Cost-free dwelling (=1)	-0.035	(0.154)	0.168	(0.184)	-0.358**	(0.179)
Children living at home (=1)	0.029	(0.070)	-0.065	(0.080)	-0.164***	(0.050)
Household head is male					-0.034	(0.049)
Observations (Number of clusters)	1,728 (598)		1,279 (434)		2,501 (816)	
R-squared	0.175		0.170		0.172	
F-test SAFL=FL=0 index (p-value)	0.011		0.006		0.007	
F-test SAFL (p-value)					0.544	
F-test FL index (p-value)					0.007	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Food consumption has been equivalised and is in logs. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F4: Consumption growth estimations (all consumption measures) showing covariates

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-durables	se	Total	se	Food	se
FL index (0-4), w	-0.005	(0.008)	-0.010	(0.009)	0.012	(0.009)
FL index (0-4), m	0.004	(0.009)	-0.009	(0.010)	-0.015	(0.012)
SAFL (1-5), w	0.001	(0.005)	-0.005	(0.007)	-0.014**	(0.007)
SAFL (1-5), m	0.006	(0.008)	0.006	(0.009)	0.012	(0.011)
Change in subjective health, w	-0.032	(0.024)	-0.013	(0.031)	-0.018	(0.029)
Change in objective health, w	-0.030	(0.052)	0.053	(0.052)	0.046	(0.073)
Change in subjective health, m	0.010	(0.021)	0.022	(0.027)	0.056*	(0.030)
Change in objective health, m	-0.087	(0.073)	0.001	(0.138)	-0.061	(0.092)
Low education dummy, w	0.012	(0.016)	0.003	(0.019)	-0.037*	(0.021)
High education dummy, w	-0.003	(0.018)	-0.016	(0.024)	-0.031	(0.023)
Low education dummy, m	0.014	(0.020)	0.025	(0.022)	0.005	(0.027)
High education dummy, m	0.024	(0.017)	0.027	(0.024)	0.019	(0.022)
Change in whether married, m	-0.187	(0.161)	-0.122*	(0.066)	-0.272***	(0.090)
Change in whether widower	0.448***	(0.130)	0.004	(0.047)	0.874***	(0.057)
Change in whether never married, m	-1.046**	(0.433)	-0.202	(0.297)	-0.499*	(0.257)
Change in whether married, w	0.368*	(0.201)	0.342***	(0.130)	-0.497	(0.362)
Change in whether widow	0.950***	(0.323)	0.811***	(0.133)	-0.090	(0.378)
Change in whether never married, w	1.197***	(0.431)	0.764***	(0.134)	-0.483	(0.392)
Household head is male	-0.042	(0.027)	-0.061**	(0.029)	-0.010	(0.036)
Household type	0.005	(0.010)	0.018	(0.012)	0.007	(0.012)
Change in whether kids live at home or not	-0.357***	(0.138)	-0.254**	(0.100)	0.020	(0.161)
Change in # of Job seekers	-0.107	(0.077)	-0.132	(0.081)	-0.122*	(0.067)
Change in # of Students	-0.199	(0.168)	-0.137	(0.124)	-0.470**	(0.201)
Change in # of Adults with unpaid work	0.037	(0.078)	-0.043	(0.121)	-0.066	(0.091)
Change in # of Retirees	0.105	(0.064)	0.042	(0.072)	0.071	(0.078)
Change in # of adults with (Partial) Work disability	0.005	(0.120)	-0.040	(0.080)	-0.004	(0.115)
Change in # of adults doing Something else	0.106	(0.140)	0.005	(0.097)	-0.073	(0.178)
Change in whether rental dwelling	0.019	(0.153)	0.077	(0.115)	0.188	(0.204)
Change in whether cost-free dwelling	0.353	(0.290)	0.088	(0.160)	0.007	(0.337)
Observations	2,755		2,755		2,755	
R-squared	0.014		0.008		0.016	
F-test FL(m)=FL(w)=0 (p-value)	0.776		0.390		0.264	
F-test SAFL(m)=SAFL(w)=0 (p-value)	0.796		0.598		0.053	
F-test SAFL=FL=0 (p-value)	0.715		0.401		0.193	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level for 1426 clusters). We use the same covariates and reference categories as in previous analyses. We tested for joint significance of SAFL (m and w), FL (m and w) and joint significance of all SAFL and FL respectively.

Table F5: Closed-form estimations (all consumption measures) including assets

	Non-durable consumption			Total household consumption			Food consumption		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	singles F	singles M	couples	singles F	singles M	couples	singles F	singles M	couples
SAFL (1-5), w	0.032*		0.002	0.003		-0.005	0.029		0.000
	(0.019)		(0.012)	(0.012)		(0.017)	(0.024)		(0.016)
FL index (0-4), w	0.022		-0.031*	0.027		0.025	0.059*		-0.058**
	(0.029)		(0.018)	(0.017)		(0.025)	(0.033)		(0.024)
SAFL (1-5), m		0.008	0.031**		0.019	0.033		-0.002	0.027
		(0.026)	(0.015)		(0.016)	(0.021)		(0.030)	(0.020)
FL index (0-4), m		-0.000	0.067***		0.006	0.035		0.065*	0.070***
		(0.031)	(0.018)		(0.018)	(0.022)		(0.037)	(0.025)
1st quintile assets	-0.173***	-0.165**	0.008	-0.084**	0.029	0.020	-0.185**	-0.250***	-0.025
	(0.062)	(0.072)	(0.042)	(0.039)	(0.039)	(0.061)	(0.094)	(0.095)	(0.061)
2nd quintile assets	-0.119**	-0.003	0.004	-0.080**	0.054	0.001	-0.134*	-0.035	-0.012
	(0.057)	(0.069)	(0.039)	(0.031)	(0.037)	(0.062)	(0.075)	(0.075)	(0.052)
4th quintile assets	-0.049	0.020	0.070*	-0.056	-0.073**	0.072	-0.135	-0.065	0.001
	(0.059)	(0.060)	(0.036)	(0.038)	(0.037)	(0.056)	(0.082)	(0.076)	(0.049)
5th quintile assets	0.089	0.194**	0.002	0.002	-0.019	-0.029	-0.098	-0.071	-0.031
	(0.075)	(0.088)	(0.037)	(0.048)	(0.059)	(0.054)	(0.094)	(0.120)	(0.047)
Observations (Number of clusters)	969 (428)	811 (337)	1,822 (690)	969 (428)	811 (337)	1,822 (690)	969 (428)	811 (337)	1,822 (690)
R-squared	0.405	0.362	0.339	0.453	0.449	0.185	0.223	0.231	0.207
F-test SAFL=FL index=0 (p-value)	0.168	0.959	0.000	0.238	0.451	0.045	0.055	0.199	0.001
F-test SAFL (p-value)			0.121			0.286			0.402
F-test FL index (p-value)			0.001			0.092			0.002

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Non-durable consumption, total household consumption and food consumption have been equivalised and are in logs. We controlled for the same covariates as in previous specifications. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income and assets distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F6: Closed-form estimations (total consumption) with interactions of (self-assessed) financial literacy within couples

	(1)	(2)	(3)
$(\text{FL index}_{\text{w}} - \overline{\text{FL index}_{\text{w}}}) * (\text{FL index}_{\text{m}} - \overline{\text{FL index}_{\text{m}}})$	0.023		0.022
	(0.015)		(0.015)
FL index (0-4), w	0.021		0.025
	(0.023)		(0.022)
FL index (0-4), m	0.033*		0.025
	(0.018)		(0.018)
$(\text{SAFL}_{\text{w}} - \overline{\text{SAFL}_{\text{w}}}) * (\text{SAFL}_{\text{m}} - \overline{\text{SAFL}_{\text{m}}})$		0.008	0.008
		(0.012)	(0.013)
SAFL (1-5), w		-0.012	-0.014
		(0.014)	(0.014)
SAFL (1-5), m		0.037**	0.032*
		(0.017)	(0.018)
Observations	2,501	2,501	2,501
R-squared	0.147	0.147	0.150
F-test FL index w (p-value)	0.174		0.147
F-test FL index m (p-value)	0.058		0.138
F-test SAFL w (p-value)		0.629	0.546
F-test SAFL m (p-value)		0.109	0.190

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level, 816 clusters). The financial literacy index is in deviation of its mean. We report the estimated coefficients, not marginal effects. We use the same set of independent variables as in previous analyses.

Table F7: Closed-form estimations (food consumption) with interactions of (self-assessed) financial literacy within couples

	(1)	(2)	(3)
$(\text{FL index}_{\text{w}} - \overline{\text{FL index}_{\text{w}}}) * (\text{FL index}_{\text{m}} - \overline{\text{FL index}_{\text{m}}})$	-0.022		-0.024
	(0.017)		(0.017)
FL index (0-4), w	-0.042**		-0.039*
	(0.021)		(0.021)
FL index (0-4), m	0.059***		0.055***
	(0.020)		(0.021)
$(\text{SAFL}_{\text{w}} - \overline{\text{SAFL}_{\text{w}}}) * (\text{SAFL}_{\text{m}} - \overline{\text{SAFL}_{\text{m}}})$		0.009	0.013
		(0.013)	(0.014)
SAFL (1-5), w		-0.018	-0.012
		(0.014)	(0.014)
SAFL (1-5), m		0.029	0.019
		(0.018)	(0.019)
Observations	2,501	2,501	2,501
R-squared	0.175	0.169	0.177
F-test FL index w (p-value)	0.049		0.064
F-test FL index m (p-value)	0.004		0.007
F-test SAFL w (p-value)		0.361	0.501
F-test SAFL m (p-value)		0.285	0.468

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level, 816 clusters). The financial literacy index is in deviation of its mean. We report the estimated coefficients, not marginal effects. We use the same set of independent variables as in previous analyses.

Table F8: Interactions mean FL and mean SAFL and age of the household head within couples

	Non-durable consumption			Total household consumption			Food consumption		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$(\text{FL index}_{\text{w}} + \text{FL index}_{\text{m}})/2$	0.045**		0.044**	0.054**		0.052**	0.024		0.025
	(0.018)		(0.019)	(0.023)		(0.023)	(0.027)		(0.027)
$(\text{age}_{\text{hhead}} - \overline{\text{age}_{\text{hhead}}})$	0.005*	0.009*	0.008	-0.003	0.004	0.002	0.002	0.007	0.005
	(0.003)	(0.005)	(0.005)	(0.004)	(0.006)	(0.006)	(0.004)	(0.006)	(0.007)
$\frac{\text{FL index}_{\text{w}} + \text{FL index}_{\text{m}}}{2} * (\text{age}_{\text{hhead}} - \overline{\text{age}_{\text{hhead}}})$	-0.000		0.000	0.000		0.001	0.001		0.001
	(0.001)		(0.001)	(0.001)		(0.001)	(0.002)		(0.002)
$(\text{SAFL}_{\text{w}} + \text{SAFL}_{\text{m}})/2$		0.012	0.005		0.012	0.005		-0.003	-0.006
		(0.016)	(0.016)		(0.020)	(0.019)		(0.020)	(0.020)
$\frac{\text{SAFL}_{\text{w}} + \text{SAFL}_{\text{m}}}{2} * (\text{age}_{\text{hhead}} - \overline{\text{age}_{\text{hhead}}})$		-0.001	-0.001		-0.001	-0.001		-0.000	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Observations	2,501	2,501	2,501	2,501	2,501	2,501	2,501	2,501	2,501
R-squared	0.262	0.259	0.262	0.101	0.099	0.101	0.104	0.103	0.104
F-test mean FL index (p-value)	0.014		0.020	0.021		0.023	0.366		0.357
F-test mean SAFL (p-value)		0.439	0.738		0.537	0.815		0.880	0.779

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level, 816 clusters). Age of the household head is in deviation from its mean. We report the estimated coefficients, not marginal effects. We use the same set of independent variables as in previous analyses. When constructing the interaction terms, we adjust the age of the household head by the overall average age.

Table F9: Closed-form estimations including interest in FL: total household consumption

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
SAFL (1-5), w	-0.010	(0.010)			-0.018	(0.014)
FL index (0-4), w	0.028**	(0.014)			0.021	(0.022)
SAFL (1-5), m			0.000	(0.012)	0.028	(0.019)
FL index (0-4), m			0.014	(0.016)	0.022	(0.018)
FL: interesting subject?, w	0.002	(0.009)			0.016	(0.015)
FL: interesting subject?, m			-0.007	(0.012)	0.023	(0.018)
Observations (Number of clusters)	1,728 (598)		1,279 (434)		2,501 (816)	
R-squared	0.378		0.350		0.149	
F-test SAFL=FL=0 index (p-value)	0.097		0.670		0.075	
F-test SAFL (p-value)					0.208	
F-test FL index (p-value)					0.189	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Total household consumption has been equivalised and is in logs. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F10: Closed-form estimations including interest in FL: food consumption

	(1) singles F	(2) se	(3) singles M	(4) se	(5) couples	(6) se
SAFL (1-5), w	0.012	(0.020)			-0.016	(0.015)
FL index (0-4), w	0.070***	(0.023)			-0.049**	(0.022)
SAFL (1-5), m			0.020	(0.023)	0.020	(0.019)
FL index (0-4), m			0.090***	(0.030)	0.059***	(0.021)
FL: interesting subject?, w	-0.019	(0.018)			0.024	(0.015)
FL: interesting subject?, m			-0.024	(0.023)	0.003	(0.017)
Observations (Number of clusters)	1,728 (598)		1,279 (434)		2,501 (816)	
R-squared	0.177		0.171		0.174	
F-test SAFL=FL=0 index (p-value)	0.006		0.003		0.003	
F-test SAFL (p-value)					0.384	
F-test FL index (p-value)					0.004	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level). Food consumption has been equivalised and is in logs. Medium education, paid employment, self-owned dwelling and the 3rd quintile of the income distributions respectively are the reference categories. Age dummies and time dummies are included.

Table F11: Consumption growth estimations including interest in FL: total household and food consumption

	(1) Total	(2) se	(3) Food	(4) se
SAFL (1-5), w	-0.016	(0.011)	-0.026***	(0.010)
FL index (0-4), w	-0.012	(0.017)	0.014	(0.015)
SAFL (1-5), m	-0.002	(0.015)	-0.011	(0.012)
FL index (0-4), m	-0.019	(0.017)	-0.020	(0.017)
FL: interesting subject?, w	0.014	(0.011)	0.006	(0.011)
FL: interesting subject?, m	-0.001	(0.014)	-0.003	(0.011)
Observations	1,252		1,252	
R-squared	0.011		0.017	
F-test FL(m)=FL(w)=0 (p-value)	0.215		0.405	
F-test SAFL(m)=SAFL(w)=0 (p-value)	0.318		0.015	
F-test SAFL=FL=0 (p-value)	0.171		0.051	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Clustered standard errors in parentheses (at the household level, 660 clusters). The same covariates and reference categories are used as in previous analyses.