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HOUSEHOLD FINANCIAL PLANNING AND SAVINGS BEHAVIOR[†]

Abstract

Greater personal responsibility towards financial decision-making is being advocated on a global basis. Individuals and households are encouraged to take a more active approach to personal finance. In this paper, we examine behavioral factors, which lead households towards savings and financial planning across a panel of 1,253 Dutch households. In line with the available literature, we find that an individual's propensity to save decreases with age and is higher among the financial literate. Moreover, we find that saving behavior varies across generations, and is significantly dominant among baby boomers. This generation effect, however, weakens once we account for more individual specifics. Our results offer evidence for parental influence, and for the effects of the psychometrics of numeracy, self-efficacy, locus of control and future orientation. A good understanding of these personality variables helps to explain why some take financial responsibility while others do not.

JEL Classification: D91 and E21

Keywords: consumption, intertemporal household choice, life cycle models and saving and wealth

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1. Introduction

During the past decade, governments around the globe have started advocating a new and responsible approach to personal finance, to encourage households to be more in charge of their own financial wellbeing¹. The 2008 global financial crisis and the recession that followed have hit families hard, and have shifted government policies away from promoting cheap financing - more often used for increased consumer spending - towards enhancing consumer awareness of individuals' long term financial needs and resources. This political shift increases the importance of households' ability to take financial responsibility and to save up for their future needs.

Now that we enter a future in which more personal savings are needed to finance our upcoming needs regarding health and pensions, we need to understand why some of us are good at saving, while others fail. A recent study by Cronqvist and Siegel (2015) analyzed individual saving behavior using Swedish data on identical and fraternal twins. Their results report that genetic variation explains about 35 percent of the variation in savings rates across individuals. The remainder appears to be a function of parent-child transmission influences, and the environment. In this paper, we empirically investigate a wide series of household backgrounds and personality variables to help explain this 65 percent of the cross sectional variation in individual savings behavior that is non-genetic.

Theoretical life cycle models predict that consumers smooth consumption over their lifetime, assuming that consumers are forward looking and make plans for their future. However, whether households are actually able and ready to manage their long-term financing responsibly is doubtful. Campbell (2006) pointed out that it is often difficult for consumers to exhibit carefully reasoned and informed economic decisions. Lusardi and Mitchell (2007) show that 45 per cent of baby-boomers in the age bracket 51-56 have done little or no retirement planning at all, and as a result they enter their golden years with low levels of wealth.

Empirically, we have learned that saving rates increase substantially with income. Dynan et al. (2004) report savings rates below 10 percent for the lowest U.S. income quintile, numbers that increase with income to over 20 percent for the fifth quintile. Typically, three sources have been identified for these differences in saving rates across income groups. Hubbard et al (1995)

¹ See World Bank's 'World Development Report 2015: Mind, Society, and Behavior' for a full and rich discussion of how policy makers are changing their ways in making institutions and consumers more responsive to the behavioral factors driving people's financial decisions.

identify differing budget constraints as the reason why lower-income households save less – lower income groups have fewer incentives to save, as they are more likely to depend on welfare programs in future bad states of the world. Bernheim (1995) provided early evidence that financial literacy is correlated with the level of education and income. In other words, differing budget constraints and differing levels of financial literacy are very likely to explain part of the variation of saving rates over income. Recently, Binswanger (2010) added a third source of savings heterogeneity among households – the loss aversion invoked by the insurance goal of savings. This loss aversion differs greatly across and within income groups and can lead bounded-rational household to over, or indeed under, save, depending on their personal dominance of the insurance goal of saving.

We extend the current analyses on financial decision making by exploring a wider set of explanatory factors that help to explain household savings and investment behavior in the cross section and that can help to enhance financial responsibility levels in the future. We construct survey questions with which we measure various socio-economic backgrounds and beliefs for a set of 1,253 Dutch households. Our analysis focuses on explaining why some of these households save or invest, while other do not. We start explaining this difference by looking at a set of well described household characteristics – demographics, income, skills and education, including financial literacy. We then extend this analysis by incorporating factors that capture a respondent's youth and financial upbringing to assess the effectiveness of homemade financial education. Finally, we involve a wide set of psychometrics to incorporate the personal variations in; numeracy, self-efficacy, locus of control, and future orientation. Our extended survey puts us in the unique position to simultaneously analyze and weigh the effects of household demographics, skills, upbringing, and personality.

Our results show that the willingness to save reflects a time preference (captured by the willingness to sacrifice present wellbeing for future results) and is stronger among younger households with high levels of financial literacy. We also detect significant traces of clustering across generations, as saving for later is more popular among the post war baby-boom generation who share an era of economic hardship during youth, than among those who were either born and raised before or after them. We also find evidence for parental and grandparental influence, as well as endowment effects in our data. But perhaps the most striking results of our analysis relate to the psychometrics within our analysis. Respondents who keep a tight household administration, who have a strong locus of control and who have a positive economic outlook, are more prone to postpone immediate consumption for the sake of future needs. We also test whether the same results can account for the observed cross sectional

variations in households' stock market activity, as financial savings are not the only means for household financial planning. Stock market activity is more common among the younger households that have higher incomes, higher financial literacy, and are more willing to take risks. Yes, when it comes to stock market activity, we show that parental influence and individual psychometrics matter as well.

The remainder of this paper is organized as follows: the next section offers a brief review of relevant literature on household financial planning and positions our paper within this rich body of literature. Section three presents our data, discusses some relevant institutional settings, provides descriptive sample statistics, and details regarding the setup of the survey analysis. In section four we report and discuss the results of our empirical analysis. While section five closes with a summary of our main findings and their implications.

2. Household Financial Planning

Whether or not households save money for later is a choice that was first addressed in the economics literature when Ramsey (1928) and Fischer (1930) introduced their infinite and finite life-cycle models. These frameworks offered a new standard for economists to think about the intertemporal allocation of time, effort and money. In its most general formulation, this life-cycle framework asserts that agents make sequential decisions to achieve a coherent goal using all the information that is available to them. Along these lines, households ought to have active savings management that helps them to smooth out their consumption over their lifespan. Over the years this life-cycle model has been extended and enriched, allowing for potentially important features such as habits, imperfection in capital markets, disagreements between husbands and wives about how much to save, limited computational powers, and discounting of the future that changes over time². An expanding body of mostly normative literature has evolved in this field, which explains how households should behave to obtain optimal savings behavior and portfolio choice over the life cycle.

In his seminal work on household finance, Campbell (2006) compared what we know about finance to what households actually do, when making financial decisions. He argues that although many households find adequate solutions to the complex investment problems they face, some households make serious investment mistakes. These mistakes are made more often by poorer and less educated households, supporting the recent call for financial education and

² See Browning and Crossley (2001) and Carbone and Duffy (2014) for a full discussion on the life-cycle model of consumption and saving.

stricter consumer regulations.³ The lack of financial literacy among some consumers was first documented by Bernheim (1995, 1998). Hilgert et al (2003) report that most Americans fail to understand basic financial concepts, particularly those related to bonds, stocks, and mutual funds. Lusardi and Mitchell's (2006) module on planning and financial literacy of the 2004 Health and Retirement Study (HRS) shows that many older individuals cannot perform simple interest-rate calculations, and do not understand inflation. Using a financial literacy construct based on a small set of numerical exercises, they conclude that financial literacy is very low among women, those with low education, and among Afro-Americans and Hispanics. As a result, these financial illiterates fail to plan and save for their retirement, and thereby run the risk of falling short later in life.

Aside from this literature on financial literacy, an older and broader literature has focused on why people's expressed intentions to save are often not realized in their daily decisions [see Katona (1975)]. One factor that has been identified as an important determinant of individual failures to save is the ability to delay gratification and exercise self-control. Although economists like to assume that the homo economics is capable of postponing short-term gratification for the sake of long-term need, early work by Strotz (1957) and Ainslie (1975) has proven different. Moreover, in more recent work by Webley and Nyhus (2006) empirical proof is reported that these time preferences can be partly transferred from one generation to the next. Financial discipline is – at least partly – the result of how we raise our children. In other words, financial education and financial upbringing may well be two routes to similar destinations – taking individual financial responsibility later in life.

In this paper, we contribute to the available literature by empirically testing a wide set of factors to unravel why savings and investments are popular among some, and not among others. We start our analysis with a baseline model specification that includes the conventional demographics (gender, age, and household composition), income, and risk adversity, skills and education. We then extend this model in two steps. First, we add a series of variables that reflect youth and upbringing. Regarding youth, build on the work of Malmendier and Nagel (2011) who showed that the era in which one is born is important for financial decisions later in life. Economic hardship during teenage years have proven to have long lasting effects on financial decision making later in life. We test this for a sample that has had a unique Dutch history, where economic hardship peaked during and right after the Second World War. Following up on the work of Webley and Nyhus (2006), we examine upbringing and parental influence by controlling for family endowments, and by incorporate parental influence through allowance

³ See Collins (2013) for a thorough discussion of the effects of financial education on knowledge and behavior.

and side jobs. The second step in our model extension involves the incorporation of a wide set of psychometrics to capture a respondents' personality. We design and include measures for Rotter's (1954) *locus of control* – the extent to which individual's believe they can control events affecting them, for Trommsdorffs' (1983) *future orientation* – the measure of the extension of time perspective into the future, for Bandura's (1977) *self-efficacy* – the confidence in the ability to exert control over one's own motivation, behavior, and social environment, and for Schwartz's et al. (1997) *numeracy* – the ability to reason and to apply simple numerical concepts. Measures used to identify specific elements of personality and beliefs, that we like to relate to savings behavior. This allows us to assess whether the inclination to save financially is function of circumstances, whether it can be triggered by upbringing and training, or whether it is a mere reflection of person variables⁴. Or perhaps, a complex combination of all of the above.

3. Data

We use data from the 2011 Dutch National Bank Household Survey (DHS). DHS is a long-standing, annual household survey that includes extensive information about demographic and economic household characteristics, focusing on wealth and savings data. The data set is representative of the Dutch population, and it contains over 2,000 households.⁵ These Dutch data are of high detail and interest, as the Netherlands has a reputation as a country of savers. However, a large fraction of the 'collective savings' in the Netherlands is a function of the compulsory pension system. Dutch households have been far from thrifty on a voluntary basis for a long time. In fact, the non-contractual savings (voluntary) have been negative since 2003. This is striking, since in the past three years the Dutch government has announced and implemented large government reforms that reduce government spending and which assume an increase in household's agility to plan and pay more of their future expenses on healthcare, education, and welfare. In other words, the Dutch society is embarking on a new period in which households are required to contribute to an increasing share of collective expenses, while their track record of savings has been weak at best⁶.

⁴ We are not the first that use the opportunities of a survey panel to measure psychometrics to analyze household financial decision-making. Van Rooij and Teppa (2014) have used the same DHS panel to link the locus of control to explain the variation across household's default choices.

⁵ See Nyhus (1996) for a detailed description of this survey and an assessment of the quality of the data. CentERdata, a survey research institute at Tilburg University that specializes in Internet surveys, manages the panel. For more information about the survey agency, see <http://www.uvt.nl/centerdata/en>.

⁶ See the DNB Bulletin 'The Dutch Savings Paradox' for a more detailed discussion of trends and statistics related to Dutch household savings.

The DHS is built up in several sections. Section A inquires about the financial background of the respondent (*i.e.*, income, savings, spending behavior, *etc.*). Section B focuses on whether households rely on external advice for their financial matters. Section C deals with the pension plan of the household, while section D asks questions with respect to housing and mortgage details. In addition to using data from the core of the DHS, we also use data from additional, self-designed survey modules on financial literacy and saving behavior, added to the survey in April 2011. This final section of the survey is designed to assess ability of households to properly make financial decisions and to trade off long-term benefits with short-term investments. In total, the survey consists of 62 questions, and requires 18 minutes to complete, on average. Survey participants are interviewed via the Internet.⁷ A total of 1,721 out of 2,028 households completed the financial literacy module -- a response rate of 84.9 percent. In the end, we narrow our sample down to the 1,253 households for which we have observations regarding all relevant questions and topics.

The two key survey questions that are at the pinnacle of our analysis are the questions that ask our respondents about their view on their willingness to save and their stock market activity. We define respondents as ‘savers’ when they indicate that they are willing to sacrifice their well-being in the present to achieve certain results in the future, and we split the sample in ‘investors’ versus non-investors based on their reply to the question whether or not they have invested with mutual funds, stock or bonds⁸. Our analysis is designed to explain why respondents vary on both accounts – whether they are willing to save for later, and whether or not they are active in stock markets.

- Insert table 1| summary statistics around here -

In table 1, we present the summary statistics for the key variables in our analysis. These statistics show that 55.8 percent of our respondents are male, and that the average respondent is 57 years of age, lives in a household of 2.3 persons, and earns 1,845 Euros net of tax every month. Besides the age structure, these characteristics are representative for the averages of the Dutch society at large. DHS respondents are older than the average person in the Netherlands,

⁷ Although the Internet connection rate in the Netherlands is among the highest in Europe (80 percent of Dutch households are connected to the internet at their home), households need not have an Internet connection to participate in the survey. Recruitment and selection of households is first done by phone with a randomly selected sample of households. Households without an Internet connection are provided with a connection or with a set-top box for their television (for those who do not have access to a personal computer). This method of data collection presents several advantages. For example, data collected using Internet surveys suffer less from reporting biases than data collected via telephone interviews.

⁸ For a full overview of the survey, we direct readers to <http://www.dhsdata.nl/site/users/login> where the 2011 Wave of the DHS is made available. This 173 page report contains a rich and detailed discussion of the exact phrasing of the questionnaire.

since the panel only includes adults (over the age of 18). The DHS sample, however, has been constructed and maintained since its inception in the early '80s to represent the Dutch (adult) population as a whole⁹. Another striking feature of our Dutch sample is the opportunity to analyze the cross sectional variation across generations. More specifically, we like to follow up on the work of Malmendier and Nagel (2011) who showed that personal experiences of economic fluctuations early in life shape individuals' willingness to take risk. They showed for a sample of U.S. households that the generation of "depressions babies" that have experienced low stock market returns throughout their youth, are more pessimistic about future stock returns, and therefore are less likely to invest in the stock markets. We exploit the Dutch settings of our sample, which involves a different economic history that has been mostly affected by the Second World War (1940-1945) and a successive era of economic hardship in the years of recovery¹⁰. Hence, we split our sample across generations that were born pre-war, post-war baby-boomers that still faced economic hardship during youth, and the younger generations that followed and who have never experienced the aftermath of these dramatic events. Finally, relating to our set of baseline variables, we also report the percentages of households who scored well on the set of six financial literacy questions that we adopted from Lusardi and Mitchell (2007). Only 15.8 percent of our Dutch respondents score five or six out of six, indicating that high financial literacy is not common in our sample.

Besides these standard demographics and household backgrounds, we also report summary statistics on four clusters of additional factors relating to the respondents' upbringing, numeracy, self-efficacy, locus of control and future orientation. In line with Webley and Nyhus (2006), we explore the link between parental influence and financial decision-making later in life. Hence, we asked our respondents questions relating to the wealth of their family during upbringing; whether their parents or grandparents granted them pocket money, and whether or not they have had a side-job, such as a paper round to earn money early on in life. All these questions are inspired by the available literature that shows that endowment and upbringing are important factors for explaining economic behavior [see Becker and Tomes (1979), Webley

⁹ In 1986 Willem Saris and Marius de Pijper of the University of Amsterdam developed a new procedure for computer-assisted data collection specifically designed for panel research. The main idea was to offer a good and reasonably priced instrument for data collection to be used for research in social sciences. A random sample of the Dutch-speaking population was provided with a computer, modem and software to communicate by telephone with a central computer located at the University of Amsterdam. In late 1990, after a few years of testing, a carefully constructed and selected panel of about 2,000 households in the Netherlands was set up at the University of Amsterdam with grants from Eurostat and the University of Amsterdam. The design of the panel was and is aimed at ensuring that the sample is representative of the Dutch-speaking population over the age of 17, since DHS topics require an adult perspective.

¹⁰ During the Second World War no official GDP growth numbers have been recorded, but during the end of this war the Dutch population suffered from famine due to the scarcity of supplies. We categorize generations to distinct between those who have versus those who have not witnessed this era during their youth.

and Nyhus (2006)]. Table 1 shows that 26.0 percent of our respondents were born into families that were well off, 53.5 percent of them received pocket money at the age of 12, and 21.6 percent were raised by parents that explicitly saved for their education, and thereby served as examples of saving for later in life.

Besides these variables that capture youth and parental influence, we also included a set of questions that proxy some psychometrics that have been addressed in related literature, and that we would like to include in our examination of the cross sectional variation on financial decision making. First, we asked our respondents about their level of education, whether they are good at mathematics, and whether they keep up with the financial news. These questions were asked to capture the numeracy and financial interest of our respondents. Table 1 shows that 39.8 percent of our respondents has a college education, 27.1 percent claims to be good at math, and only 11.3 percent keeps track of the financial news. Later in our regression analysis, we explore whether these attributes are triggers for saving or investing for later. We also asked three questions that relate to self-efficacy and self-control. 74.5 percent of our respondents manage the administration within their household, 60.2 percent claims to keep this administration tight, and another 51.5 percent expressed the ability to keep track of their expenses. Perhaps the two most noteworthy variables in table 1 are the internal and external locus of financial control. These measures capture the extent to which individuals are willing to take on the responsibility of their financial decisions. The reported averages for the sample as a whole line up with comparable statistics and scores in other studies. In our analysis the variation in these two metrics is more relevant, and will explicitly be tested in the regression in the subsequent section. Finally, we also include a set of three questions that relate to the future orientation of our respondents. Here we ask our respondents how they consider the economics outlook, their immediate spending needs and their time horizons. Almost a third of our respondents expressed a positive economic outlook, and we will include these expectations and views in our analysis of saving and investing behavior.

4. Empirical Analysis

We start our analysis of the cross sectional variation in financial activity and responsibility, with the estimation of a baseline model that includes the variables that have been tested before in the financial planning literature. In table 2, we report the results of both a simple OLS and logit specifications for the analysis of willingness to save. The 'savers' in this and the following regressions are the respondents who indicated to be willing to sacrifice present wellbeing to

achieve future results. We thus relate this willingness to a wide set of household variables that capture demographics, income and financial literacy.¹¹

- Insert table 2| baseline saving regressions -

The results in table 2 show that the willingness to save decreases with age, is stronger among the financial literate and peaks among the baby-boomers in our sample. The age and generation effect are not mutually exclusive here. We find that on an individual basis the willingness to save for later decreases with age. This is a non-linear relationship which flattens out at sixty years and gradually turn positive thereafter. An obvious explanation lies in the fact that young respondents have the longest horizons and therefore the greatest ability to materialize future results. At the same time, we can explain this change in age trend around the age of sixty, by the generational effects that we record separately. Here we document a significant peak for the generation that was born between 1945 and 1960. Compared to the respondents born after 1975 these baby boomers are 23.4% more likely to save for later, although their time horizons are shorter. The most plausible explanation for this finding lies in the work of Malmendier and Nagel (2011) and relates to the economic hardship that occurred in the Netherlands just after the Second World War. During this period when the baby boomers were born and raised, the Dutch economy suffered greatly from the harmful effects of the war. Food and shelter have long been far from obvious, which results in vast levels of poverty across the country. Being raised in the times of needs can ingrain one on how future earnings are spent or saved. This Dutch post-war generation is known for its modesty and ability to appreciate the smaller things in life. Sacrificing present wellbeing is not as hard for them.

The positive and significant effect of financial literacy indicates that those who understand financial matters better are also more likely to take action for their future financial requirements. This does not come as a surprise, and confirms earlier findings of Lusardi and Mitchell (2007) who found a similar relation between financial literacy and active pension planning. The signs of all other variables in this baseline model all correspond with intuition and the literature, but in all cases they also lack statistical significance. In the next step of our analysis, we extend this baseline model to verify whether other backgrounds and factors can enhance our understanding, and whether alternative explanation strengthen or weaken our baseline relationships.

¹¹ Savers have a greater incentive to acquire more human capital in the form of improving their financial literacy, numeracy skills, self-efficacy etc. To address this issue we specifically include questions relating to upbringing, and rely on the more general finding that psychometric variables are less susceptible to change over adulthood. Thus circumstances are partly endogenously determined as a function of the underlying psychometric parameters.

The first step in our model extension relates to the inclusion of ‘upbringing and parental influence’. We wonder whether, apart from being young or born into a specific era, the first phase of our lives is important for understanding how we make financial decisions later in life. We all age, and we all are part of a generation, but within these generations, we all may differ when it comes to the type of upbringing that we have had. Hence, in table 3 we first compare the OLS baseline coefficients with a model in which also include the responses to our questions that relate to upbringing and parental influence. Three of the additional coefficients turn out to be significant. Respondents, who were born into families that were well off financially, are more likely to save. This is not a mere reflection of differences in income, as these have been controlled for separately in our baseline specifications. Besides being born into a wealthy family, having a side job appears to increase the appreciation of income and money and enhance the willingness to save some of it for future needs. If (grand)parents actively stimulate financial saving behavior during youth, we find that this willingness is also stronger along the lifecycle.

- Insert table 3| extended saving regressions -

Apart from upbringing and parental influence, we also empirically test some of the available psychometrics to assess whether personality is attributing to financial planning and decision-making. We undertook this ‘horserace’ in four additional steps. We start by additionally including ‘numeracy’, where we capture the combination of mathematical abilities, financial interests and college education. In the third column of table 3, we show that respondents, who indicated to be keeping up with the financial news, are significantly more likely to save for future needs. It appears that being interested is more relevant for explaining saving behavior than the level of education and numeric ability. We should also stress that including college education does not affect our coefficient for income, although they are obviously correlated. The effects of financial literacy appear to be reduced somewhat, when accounting for mathematical skills. This indicates that the common metric for financial literacy may also reflect some aspects of numeracy.

When we then turn our attention to measures for self-efficacy, we discover some interesting results. Here we find that managing the household administration is not relevant for explaining individual saving tendencies. It is not the *experience* of managing the household administration, but the *way* of doing the household administration that seems to matter here. Respondents who indicated that they keep a tight administration are significantly more willing to make sacrifices for future needs. Overview and orderliness are also important, not just

exposure to the task of financial planning. This is also confirmed by the other finding that shows that keeping track of expenses, (perhaps a more detailed specification of a tight administration), also adds to the propensity to save.

A third set of psychometrics that we include in table 3, relates to the locus of control and future orientation. In appendix A, we specify the 13 questions with which we constructed the two metrics that are included in the fifth column of table 3. Our finding here, is straightforward, convincing and significant. A strong internal locus of financial control increases the odds of being willing to sacrifice present wellbeing for future results. This does not come as a surprise, since the locus measure quantifies the belief of respondents that future results are the outcomes of one's own efforts. If this belief is strong, then it makes more sense to commit current resources for future outcomes. If the chance construct were dominant, we would expect little willingness to save, as the respondent would be rather doubtful of any future outcomes. However, our results for the chance construct score lack significance. We can only conclude that faith in the future results of personal actions constitutes to a greater willingness to save. The final variables relate to the future orientation of our respondents. One may expect that if future orientation is strong, then the tendency to save for later needs is more prominent as well. This we verify, by including the answers to a set of three final questions, of which two turn out to be significant here. We find that this tendency to save increases with optimism regarding the economic outlook. The optimists appear to be more willing to postpone their consumption, while those more pessimistic have more of a tendency to spend right away. To test this interpretation directly, we also pose the question of how respondents rank themselves on a 12-point scale regarding their tendency to spend immediately (1) versus saving as much as possible (7). This response is clearly relevant for explaining the propensity to save, and shows that immediate spending erodes the desire to save.

An interesting finding regarding our locus of control and future orientation results, we should also stress the fact that generation effects do disappear once we account for the individual variation on these psychometrics. In other words, the era during which one is born and raised matters, but financial saving behavior is influenced more by our personal locus of control and our future orientation.

Saving by means of a personal savings account is obviously not the only way in which households can take control of their personal financial responsibility. Planning for the future financial needs may in many cases be better served by the high returns that one can find on the longer horizon investments in stock markets. Hence, we have repeated the same cross sectional analysis across our households, but replaced the dependent variable of saving, by activity in

stock markets. We have asked our respondents whether they have invested in stock markets, and we use the same baseline and extended model specifications to understand their responses. The results are reported in table 4.

- Insert table 4| extended investing regressions -

The baseline model results in the first column show that stock market activity is more common among the younger households that have higher incomes, higher financial literacy and are more willing to take risks. Results that are in line with the recent work of Van Rooij and Teppa (2014). The results regarding upbringing and parental influence are weak compared to the ones related to saving behavior. We find only weakly significant results for the effects of endowment. Respondents born into richer families are slightly more likely to become active in the stock markets later in life. The fact that these results are less compelling may well be related to the fact that 'saving for later' is within the general public more widely acknowledged in family discussions than stock market investment strategies. Regarding numeracy, we find that only education proves relevant for stock market activity. This overlaps with the income results that we detected earlier in the baseline model. Mathematical skills and financial interests do not seem to matter significantly. When including self-efficacy, we find that managing household administration is the key variable. Respondents who manage the household admin are significantly more likely to also be active in stock markets; an intuitive result. Most elucidating are the results for the locus of control. Here, we find that respondents are more likely to invest in stock markets when they score low on chance. If chance would be dominant in their view of the world, stock market would be mere lotteries, and participating would be less appealing.

5. Conclusions, Implications and Suggestions for Further Research

To what extent do households plan financially and why do some households save or invest while other do not? These are two questions, which have been at the heart of the economics literature for many decades. To shed some more light on answering these questions, we blend three elements from the literature, life-cycle models, financial literacy, and the psychometrics of decision-making. We construct survey questions to measure the financial activity of our respondents – a set of 1,253 Dutch households. Our extensive survey puts us in the unique

position to simultaneously analyze and weigh the effects of household demographics, skills, upbringing, and personality variables into the current research in this area.

Our results show that the willingness to save (to sacrifice present wellbeing for future results) is stronger among younger households with high levels of financial literacy. We also detect significant traces of generational clustering, as saving for later is more popular among the post war baby-boom generation, than among those who were born and raised before and after them. This generation effect may well be explained by the work of Malmendier and Nagel (2011) who documented similar findings regarding depression babies and their risk appetite later in life. In the Dutch settings of our sample the post war period has been associated with the toughest economic circumstances and appears to be still visible in the cross sectional variation of the saving behavior in 2011. More specific data is needed to disentangle these cohort effects, and identify the exact background factors that cause these. We suggest that further research is needed to extend the work of Malmendier and Nagel (2011) to other markets with varying historic backgrounds.

We also find evidence for (grant)parental influence in our data. Being born into rich families increases the propensity of saving money later in life. But perhaps more interesting is the finding that shows that parental stimulation and an experience with a side job during youth leave permanent traces on savings behavior later in life. One can teach children the value of money in a way that affects decision making in adult life. These results are in line with Webley and Nyhus (2006), and are important for policymakers that reform policies across generations. The international shift towards policy that invoke more financial planning on the household level, will cater new generations that would benefit from upbringing that prepares them explicitly for these responsibilities.

Finally, our results also offer evidence that savings behavior is influenced by a broader set of behavioral psychometrics. Respondents who are financially interested, who keep a tight household administration, who have a strong locus of control and who have a positive economic outlook are all more prone to postpone immediate consumption for the sake of future needs. We find that households that save share a certain set of personality variables. This is important, also for policymakers. Thus far, a lot of policy attention has been targeted at fostering financial literacy, which is achieved mostly by educating and informing citizens. Our results show that a strong locus of control may well be more important to nurture a future willingness to save. Enhancing an internal locus of control will not be easily achieved, not by simple means of information. Further research is needed to explore ways in which future policy can be designed

to nudge households into planning their own financial future, given that their psychometric profile does not trigger this automatically.

We also test whether the same results can account for stock market activity, as financial savings are not the only means for household financial planning. Stock market activity is more common among the younger households that have higher incomes, higher financial literacy and are more willing to take risks. But also when it comes to stock market activity, we show that individual psychometrics matter. Households are more likely to invest their wealth on stock markets, whenever they believe that future outcomes are not the outcome of chance nor luck alone.

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Table 1: Summary Statistics

Variable	Average	St. Dev.
Baseline variables		
Male respondents (percentage)	0.558	0.497
Age head of household (years)	57.042	13.365
Generation born before 1945	0.261	0.439
Generation born between 1945-1960	0.418	0.493
Generation born between 1960-1975	0.244	0.429
Household with children	0.291	0.454
Household size (number of persons)	2.341	1.173
Household monthly net income (thousand euros)	1.711	1.042
Financial literacy score 5 or 6 (percentage)	0.158	0.365
Risk taking (scaled 1-7)	0.095	0.294
Upbringing variables (percentages)		
Respondents born into well off families	0.26	0.439
Received allowance age 12	0.535	0.499
Parents saved for respondents' education	0.216	0.412
Paper round during teenage years	0.586	0.493
Grandparents stimulating saving	0.838	0.369
Numeracy variables (percentages)		
College education	0.398	0.49
Good at mathematics	0.271	0.445
Keeps up with the financial news	0.113	0.316
Self-efficacy variables		
Manages household administration (percentage)	0.745	0.436
Keeps a tight household administration (percentage)	0.602	0.49
Keeps track of expenses (scaled 1-5)	3.449	1.098
Locus of control and future orientation variables		
Strong internal locus of control (scaled 1-7)	4.433	0.889
High score of chance construct (scaled 1-6)	2.905	0.791
Positive economic outlook	0.311	0.463
Future orientation (scaled 1-12)	7.124	0.526
More distant time horizons (scaled 1-5)	2.483	1.187
N	1253	

Table 2: Baseline Saving Regressions

VARIABLES	(1) ols	(2) odds ratio
Male respondents	-0.00381 (0.0294)	0.979 (0.145)
Age head of household	-0.0355*** (0.0131)	0.859** (0.0562)
Age Squared	0.000237** (0.000103)	1.001* (0.000559)
Generation born before 1945	0.143 (0.144)	1.544 (1.039)
Generation born between 1945-1960	0.234* (0.127)	2.789* (1.571)
Generation born between 1960-1975	0.132 (0.0871)	1.776 (0.678)
Household with children	0.0251 (0.0538)	1.136 (0.289)
Household size	-0.00303 (0.0204)	0.984 (0.0947)
Monthly net income	0.0297 (0.0211)	1.172 (0.129)
High financial literacy	0.102*** (0.0369)	1.640*** (0.279)
Risk taker	0.0735 (0.0449)	1.427* (0.295)
Constant	1.101*** (0.362)	(18.91)
Observations	1,253	1,253
R-squared / Pseudo-R-squared	0.063	0.053

Robust standard errors in parentheses

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

Odds Ratios given for Ordered Logit Model

Table 3: Baseline Saving Regressions

	Basic (1)	Upbringing (2)	Numeracy (3)	Self-efficacy (4)	Locus-future (5)
Male respondents	-.010 (.030)	-.013 (.030)	-.015 (.030)	-.002 (.030)	-.007 (.028)
Aged 20-25	.504 (.155)***	.495 (.155)***	.507 (.155)***	.518 (.145)***	.351 (.143)**
Aged 25-30	.156 (.124)	.113 (.124)	.101 (.128)	.077 (.128)	.011 (.129)
Aged 30-35	.050 (.070)	.034 (.070)	.034 (.071)	.051 (.070)	.016 (.070)
Aged 35-40	.057 (.057)	.032 (.057)	.034 (.057)	.050 (.055)	.017 (.054)
Aged 40-45	.019 (.057)	.018 (.057)	.020 (.057)	.022 (.055)	.020 (.053)
Aged 45-50	.098 (.055)*	.078 (.055)	.085 (.055)	.094 (.054)*	.082 (.053)
Aged 50-55	.0003 (.050)	-.006 (.050)	-.004 (.049)	.014 (.049)	-.012 (.047)
Aged 55-60	.065 (.046)	.056 (.046)	.053 (.047)	.065 (.046)	.076 (.044)*
Aged 60-65	.013 (.042)	.013 (.042)	.012 (.042)	.009 (.041)	.031 (.039)
Aged 65-70	-.127 (.040)***	-.120 (.040)***	-.120 (.040)***	-.118 (.040)***	-.093 (.039)**
Aged 70-75	-.113 (.044)**	-.096 (.044)**	-.099 (.044)**	-.095 (.044)**	-.058 (.042)
Aged 75-80	-.068 (.052)	-.046 (.052)	-.046 (.051)	-.036 (.051)	-.013 (.049)
Aged 80-85	-.122 (.063)*	-.094 (.064)	-.095 (.063)	-.110 (.064)*	-.070 (.062)
Aged 85-90	.070 (.185)	.095 (.187)	.089 (.183)	.128 (.207)	.198 (.186)
Household with Children	.039 (.055)	.041 (.054)	.042 (.054)	.046 (.055)	.053 (.051)
Household size	-.0003 (.020)	-.002 (.020)	-.004 (.020)	-.010 (.021)	-.014 (.019)
Household monthly net income	.031 (.021)	.021 (.022)	.012 (.023)	.005 (.023)	-.002 (.022)
High financial literacy	.102 (.037)***	.100 (.037)***	.089 (.037)**	.094 (.037)**	.084 (.035)**
Risk taking	.078 (.046)*	.052 (.047)	.036 (.047)	.032 (.047)	.007 (.045)
Respondents born into well off families		.063 (.032)**	.058 (.032)*	.065 (.032)**	.056 (.030)*
Received allowance age 12		.009 (.028)	.008 (.028)	.015 (.027)	-.001 (.026)
Parents saved for respondents' education		.024 (.035)	.026 (.036)	.010 (.035)	-.001 (.034)
Paper round during teenage years		.036 (.013)***	.034 (.013)**	.031 (.013)**	.023 (.013)*
Grandparents stimulating saving		.031 (.012)**	.030 (.012)**	.033 (.012)***	.029 (.012)**
Good at mathematics			.013 (.030)	.003 (.030)	-.009 (.028)
Keeps up with the financial news			.085 (.045)*	.071 (.045)	.045 (.043)
College education			.013 (.028)	.021 (.028)	.017 (.027)
Manages household administration				-.016 (.031)	-.008 (.030)
Keeps a tight household administration				.179 (.031)***	.112 (.031)***
Keeps track of expenses				-.033 (.014)**	-.018 (.013)
Strong internal locus of control					.064 (.014)***
High score of chance construct					.005 (.016)
Positive economic outlook					.254 (.031)***
More distant time horizons					.022 (.010)**
Obs.	1253	1253	1253	1253	1253
R ²	.066	.082	.086	.111	.185

Table 4: Investing Regressions

	Basic (1)	Upbringing (2)	Numeracy (3)	Self-efficacy (4)	Locus-future (5)
Male respondents	.004 (.025)	.010 (.025)	.020 (.025)	.020 (.025)	.024 (.024)
Aged 20-25	-.144 (.049)***	-.134 (.047)***	-.126 (.057)**	-.121 (.061)**	-.107 (.065)
Aged 25-30	-.080 (.068)	-.101 (.071)	-.127 (.075)*	-.129 (.074)*	-.140 (.073)*
Aged 30-35	-.055 (.044)	-.069 (.045)	-.077 (.045)*	-.083 (.045)*	-.083 (.045)*
Aged 35-40	.013 (.044)	.011 (.045)	.005 (.045)	.014 (.045)	.015 (.045)
Aged 40-45	.104 (.048)**	.101 (.048)**	.104 (.047)**	.102 (.047)**	.097 (.047)**
Aged 45-50	.003 (.043)	-.002 (.044)	.010 (.044)	.013 (.044)	.014 (.043)
Aged 50-55	-.009 (.041)	-.011 (.041)	-.004 (.040)	.004 (.040)	.008 (.040)
Aged 55-60	.029 (.039)	.030 (.039)	.034 (.039)	.038 (.038)	.036 (.038)
Aged 60-65	.028 (.037)	.031 (.037)	.034 (.037)	.038 (.037)	.039 (.036)
Aged 65-70	-.018 (.039)	-.010 (.039)	-.003 (.039)	.005 (.039)	.004 (.039)
Aged 70-75	-.030 (.041)	-.021 (.042)	-.021 (.042)	-.022 (.042)	-.014 (.042)
Aged 75-80	.025 (.048)	.034 (.048)	.045 (.048)	.049 (.048)	.055 (.048)
Aged 80-85	-.030 (.066)	-.021 (.067)	-.031 (.066)	-.033 (.065)	-.025 (.065)
Aged 85-90	.084 (.151)	.081 (.157)	.088 (.161)	.084 (.159)	.092 (.159)
Household with Children	-.025 (.040)	-.026 (.040)	-.016 (.040)	-.042 (.041)	-.035 (.041)
Household size	-.020 (.015)	-.018 (.015)	-.020 (.015)	-.005 (.015)	-.007 (.015)
Household monthly net income	.074 (.017)***	.067 (.017)***	.043 (.017)**	.034 (.017)**	.029 (.017)*
high financial literacy	.166 (.036)***	.159 (.036)***	.145 (.036)***	.138 (.037)***	.131 (.036)***
Risk taking	.245 (.045)***	.225 (.045)***	.215 (.045)***	.212 (.045)***	.204 (.045)***
Respondents born into well off families		.055 (.028)**	.039 (.028)	.041 (.028)	.036 (.028)
Received allowance age 12		.019 (.024)	.016 (.024)	.016 (.024)	.015 (.023)
Parents saved for respondents' education		.056 (.030)*	.045 (.030)	.044 (.030)	.041 (.030)
Paper round during teenage years		-.0004 (.011)	-.0002 (.011)	.0002 (.011)	.0005 (.011)
Grandparents stimulating saving		.003 (.010)	.003 (.010)	.0006 (.010)	-.002 (.010)
College education			.095 (.025)***	.093 (.025)***	.085 (.025)***
Good at mathematics			.006 (.027)	.002 (.027)	-.001 (.027)
Keeps up with the financial news			.036 (.043)	.038 (.044)	.038 (.044)
Manages household administration				.094 (.023)***	.095 (.023)***
Keeps a tight household administration				.007 (.026)	.012 (.026)
Keeps track of expenses				-.015 (.011)	-.017 (.012)
Strong internal locus of control					.001 (.012)
High score of chance construct					-.033 (.013)*
Positive economic output					-.019 (.026)
More distant time horizons					.014 (.009)
Obs.	1253	1253	1253	1253	1253
R^2	.108	.118	.131	.14	.146

Appendix A| Locus of financial control question set

Please state the level to which you agree with the following statements

01 (completely disagree) – 02 – 03 – 04 – 05 – 06 – 07 (completely agree)

Internal Dimension

LOCUS01: Saving and careful investments are the most important factors to become rich

LOCUS02: Whether or not I end up rich depends mostly on my abilities

LOCUS03: People that handle their financial affairs prudently remain rich in the longer run

LOCUS04: Generally speaking, it is my own fault if I end up poor

LOCUS05: I am usually capable of handling my own personal affairs

LOCUS06: If I get what I want, this usually results from my own hard labor

LOCUS07: My life results from my own actions

Chance Dimension

LOCUS08: There is little one can do to protect myself from poverty

LOCUS09: Ending up rich has nothing to do with luck

LOCUS10: Regarding money, there is little one can do for yourself once you are poor

LOCUS11: In my case, saving money is not prudent as financial matters depend on luck

LOCUS12: Faith is the prime factors that determines whether you end up rich or poor

LOCUS13: Only by winning lotteries or inheriting money, one can get rich