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DO BEHAVIOURAL CHARACTERISTICS AFFECT SAVING DECISIONS? IN THE EXAMPLE OF UNITED STATES HOUSEHOLDS

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ABSTRACT

The study focuses on the link between behavioural characteristics and the accumulated amount of savings relative to income. Using a representative survey data from the United States the study tests four hypotheses that in summary state that individuals (1) with optimistic attitudes, (2) who do not emphasize on materialistic values, (3) with high self-control and (4) whose parents fostered financial knowledge in childhood are likely to save more. Hypotheses are tested with Ordinary Least Squares regression models with robust standard errors and a continuous dependent variable of the ratio of savings to income. This study finds that the association between optimistic attitudes and savings is negative, while it is positive for self-control and having parents who fostered knowledge of financial well-being in childhood. On the other hand, the link between materialistic values and savings is ambiguous.

Keywords: Savings, behavioural finance, behavioural characteristics, household finance, National Financial Well-Being Survey data

INTRODUCTION

Behavioural finance has gained more attention during the recent years due to the realisation amongst financial experts and researchers that it can explain some of the phenomena related to general economy better than traditional finance can. Financial decisions and mistakes of households hold great influence over financial markets and outcomes and researching the underlying causes has created a lot of new data and literature in the recent decade.

Saving decisions are not only influenced by economic factors, instead, there are numerous preferences, traits and values that affect the household saving decisions. In general, academic literature tends to agree that people do not save enough and that a number of psychological factors (such as non-standard preferences and biased beliefs) can be responsible for households' under-saving (Illiashenko 2017). Unfortunately, the existing empirical literature rarely tests for the effect of several behavioural factors simultaneously. Reason for scarceness of studies may be the difficulty of measuring the behaviour of households as it incorporates different aspects that have not been considered within the traditional finance (Campbell 2006).

Under-saving can lead to different welfare problems. Beyond difficulties of maintaining a high standard of living after retirement, lack of savings can lead to difficulties of coping with the effects of economic recession and protecting oneself from the unexpected expenses or losses, and the inability to take the advantage of beneficial investment opportunities (Karlan *et al.* 2014). For example, today the spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has put individuals in a position where their emplyoment status is uncertain and therefore, they rely more on their savings, which are a crucial determinant of their financial well-being in this situation. Therefore, it is important not only to understand the factors behind households decision to save but to understand how much savings individuals have accumulated over time. In this respect, it is unfortunate that the majority of existing studies focus on household saving rates only.

The aim of this thesis is to explain how behavioural preferences, values, and traits influence households' saving decisions and the amount of savings households have.

The main research question is as follows: Do optimism, materialistic values, self-control, and parental influence during childhood affect the saving decisions and the amount of savings?

In order to meet the aim of the thesis and to provide an answer to the research question, following hypotheses were formulated based on existing theory and prior empirical evidence: individuals (1) with optimistic attitudes, (2) who do not emphasise on materialistic values, (3) with high self-control and (4) whose parents fostered financial knowledge in childhood, are likely to save more.

The study is carried out by using the representative cross-sectional data from the United States that was collected by Consumer Financial Protection Bureau in 2016. The data allows to test a number of behavioural predictors of savings simultaneously. To the best of the author's knowledge, no such research has been previously conducted in particulary with this dataset.

Within the cross-sectional study, hypotheses are tested and regression analysis is conducted by using two different methods. In the main part, the Ordinary Least Squares (OLS) regression model with robust standard errors and a continuous dependent variable of savings to income ratio is ran. This is rather a novel approach and to the best of author's knowledge, this study is the first to explore the determinants of savings to income ratio in a representative sample of United States adults. Later on, robustness analysis is conducted with ordered logit regression model with robust standard errors and with a categorical dependent variable, level of savings.

First chapter of the thesis gives an overview of previous studies and literature by describing the theory of savings, bringing historical real life examples and data of United States households and characterizing the socio-economic and behavioural variables that affect the saving habits of households. In the second chapter an overview of the data and variables used and the structure of the OLS model and ordered logit model for robustness analysis has been given. Third chapter describes further the regression analysis conducted within this thesis and presents the results of OLS regression with robust standard errors. Moreover, results of robustness analysis have been presented. In the fourth and final main chapter, the author provides a substantive discussion regarding the results and how the aim of the thesis was met.

The author of this graduation thesis would like to thank her supervisor, Pavlo Illiashenko, for his help in the completion of this master's thesis.

1. OVERVIEW OF PREVIOUS LITERATURE

Current chapter reviews literature on households' saving behaviour and is organised as follows. Firstly, the author provides an overview of the most well-known theories on saving and consumption behaviour. Secondly, the chapter reviews an empirical literature that investigates the role of different socio-economic factors, behavioural traits, preferences, and values as predictors of households' saving habits. Finally, the author concludes with a description of the United States households' saving behaviour throughout the history.

1.1. Theory of saving decisions

In 1930s, John Maynard Keynes suggested that both marginal and average propensities to save increase with income. Keynes also suggested that saving decisions are linked to several following motives (Keynes 1936, 107-109):

1) The precautionary motive – "to build up reserve against unforeseen contingencies";
2) The life-cycle motive – "to provide for an anticipated future relation between the income and the needs of the individual or his family different from that which exists in the present, as, for example, according to old age, family education, or the maintenance of dependents";
3) The intertemporal substitution motive – "to enjoy interest and appreciation, i.e. because a larger real consumption at a later date is preferred to a smaller immediate consumption";
4) The improvement motive – "to enjoy a gradually increasing expenditure, since it gratifies a common instinct to look forward to gradually improving standard of life rather than the contrary, even though the capacity for enjoyment may be diminishing";
5) The independence motive – "to enjoy a sense of independence and the power to do things, though without a clear idea or definite intention of specific action";
6) The enterprise motive – "to secure *a masse de manoeuvre* to carry out speculative or business projects";
7) The bequest motive – "to bequeath a fortune";
8) The avarice motive – "to satisfy pure miserliness, i.e. unreasonable but insistent inhibition against acts of expenditure as such".

Keynes' list of motives to save was complemented with an additional motive in 1996 by Browning and Lusardi. They included a "down payment" motive which stands for the motivation "to accumulate deposits to buy houses, cars and other durables" (Browning, Lusardi 1996, 1797).

To support the theory with more evidence, then for instance, in 1960s the main motives to save among United States individuals were related to having funds for emergencies, retirement or for durable goods and holidays but not as much to save with a purpose of earning future income through investments or having assets that could be left for their heirs (Katona 1975 referenced in Canova, *et al*. 2005). Later on, Kotlikoff (1989) wrote in his book that the precautionary nature was the main motive for why 30% of families located in the United States would practice saving money at all (Kotlikoff 1989 referenced in Canova, *et al.* 2005).

Keynes theory on consumption and savings became very known among economists but it was quite soon contradicted by the life-cycle theory which was suggested in the early 1950s by Franco Modigliani along with Richard Brumberg. Rather than arguing about the importance of the level of household income, they suggested the individuals' demographic characteristics, more precisely age, and aggregate consumption levels both in current and future periods being more evident as to why individuals' consumption decisions may vary. (Ando, Modigliani 1963) Simply put, the idea of it was that the closer individuals' get to their retirement age, the wealthier they become. As they enjoy their retirement phase, they need to liquidate their assets in order to cover their daily expenses. This in turn directs money into circulation and ends up in the hands of youngsters who are in the life stage of increasing their monetary resources. Therefore, saving rate becomes higher if incomes are growing, because youngsters are saving more than retirees are using up their resources and thus, for example, population growth causes positive saving. (Deaton 2005)

Few years later (1957) Milton Friedman proposed the permanent income hypothesis which is based on theory that the individual's consumption is not determined only by its temporary income but also by the expected future income and that the changes in one's permanent income determine the relationship between savings and consumption (Friedman 1957). In conclusion, both of these works stated that an individual's consumption is rather influenced by the income's long-run growth than its temporary fluctuations which eventually on a larger economic scale acts as a stabilizer to short-term financial shocks (Modigliani 2003). Additionally, in 1988, Richard Thaler and Hersh Shefrin proposed a behavioural life cycle hypothesis (BLC) with an aim of complementing the life-cycle theory and permanent income theory with three behavioural aspects: 1) Self-control; 2)

mental accounting and; 3) framing. They also suggested that the saving habits of an individual may differ depending on the type of income they receive, whether it is a regular income or an irregular one-off income payment. (Shefrin, Thaler 1988)

While all of the above named theories have created a basis of knowledge for how households act when it comes to their consumption and saving behaviour, it has become more evident in the recent years that none of them are completely comprehensive and that there are numerous factors that need to be considered in order to explain the behavioural aspects of an individual when it comes to financial decision-making process. As for example, Baranzini (2005) presents that one of the significant impactors is the inter-generational wealth that is on an international level a lot higher (50-80%) than previously thought (20%) and has the most impact on individuals who are older than 50 years (Baranzini 2005). Besides that, there are countless of studies that present the importance of households' traits, preferences and values which have a significant impact on their saving habits and some of which the author shall present in the following chapters more precisely. As households' financial behaviour in general is the basis for the economy, then it is crucial to understand what are the different behavioural aspects that affect the financial behaviour of a consumer.

1.2. Socio-economic factors

Previous studies have identified multiple socio-economic predictors of individual saving decisions. According to Fisher, Anong these socio-economic predictors include the following: age, income, income uncertainty, wealth, homeownership, household composition, health status, education, race/ethnicity, and employment (Fisher, Anong 2012).

In addition to individual-level factors, literature identified several predictors related to wider economic conditions. For example, cross-country research shows that saving rates and the propensity to save are generally higher in wealthier countries (Schmidt-Hebbel 1992), while Gurun *et al*. (2017) find that people living in locations affected by economic shocks are more likely to build up their savings. With a purpose of not being too vague, current research covers only some of the previously named factors.

As mentioned in previous chapter, a number of studies prove that the monthly fixed income of an household can have a major impact on whether a certain household saves for retirement or how substantial amount they have set aside for rainy days (Aizcorbe *et al*. 2003; Perry, Morris 2005; Fisher, Anong 2012). Using the data from Consumer Expenditure Survey (1972-73) and compiling a multiple regression analysis, the results show that there does exist a relationship between an individual's level of income and their decision to put money aside (Hefferan 1982). More precisely, the higher the level of income, the higher is the probability that an individual practices saving behaviour (Chang 1994; Yuh, Hanna 2010). Even in the case where households have expectations of their income level rising in the near future, they are more likely to practice saving behaviour (Rha *et al*. 2006). It has been further documented that in overall comparison some of the poorer individuals tend to formulate a minority that makes significant mistakes when it comes to their financial decisions and actions (Campbell 2006).

One of the reasons of under-saving among low-income households may be lack of access to retirement plans among those households (Rhee, Boivie 2015) which results in a poorer financial well-being during their retirement (Balasuriya *et al*. 2014). Another reason may be that these households neither have any knowledge of the instruments that are available for saving nor do they have the skills to select out the most appropriate ones for themselves by analysing the different risks and costs certain instruments may involve. Eventually, it does not mean that they do not save at all, as they may collect money under mattresses or invest it into livestock (Karlan, *et al*. 2014).

According to Browning and Lusardi, it appears, that the aforementioned saving motives listed by Keynes may differ depending on the accumulated wealth of a household (Browning, Lusardi 1996). Apparently when it comes to low-income households then their main motive is to cover their daily expenses. Increase in income brings along motivation to reserve some money also for different kind of emergencies. On the one hand, the higher the level of income becomes, the more determined individuals become, when it comes to saving habits, as they tend to have a lot more motives for this behaviour. With a higher income level, households are more motivated to save for retirement, for their children's needs and for creating better life conditions and advancing their standard of living. (Canova *et al*. 2005) But on the other hand, when the increase in wage is more substantial or an individual has benefited from having a strong position in a growing financial market, then the incentive to save may be lower due to the abundance of wealth (Rha *et al*. 2006).

In 2011, a study carried out among Dutch population, showed that both women and individuals with lower level of education tend to lack most basic financial skills. This may be mainly due to the financial literacy being higher among individuals who have obtained a higher degree of education. The data also shows Dutch men being more financially literate than women, and also, thinking more about their financial security during retirement (Alessie *et al*. 2011). This is also consistent with the evidence found by Lusardi and Mitchell, as they prove that there are large gender differences when it comes to basic financial knowledge and its effect of financial behaviour (Lusardi, Mitchell 2008). Furthermore, the effect of education creating an ability to make better financial decisions has been proven by other studies too, and this effect is even stronger if the education has been somewhat related to finance (Bernheim *et al*. 2001; Lusardi, Mitchell 2008).

Another factor to emphasize would be the age of an individual, and in this case, different results have been reported. Some of the studies report that increase in savings can be expected along with age (Katona 1975; Mirer 1979; Chang 1994). However, various studies have found evidence to support the Life Cycle Hypothesis. For example, one research, that was conducted in Pakistan, found that saving may increase with age but later on it still tends to decline when reaching a certain point during lifetime (Burney, Khan 1992). Findings made by Rha are also consistent with the theory, as she reports that there is a non-linear effect on the probability of saving. During lifetime, the probability of saving in earlier years is higher, when households may have set some saving goals that are yet to achieve. Later in life, when goals have been met or even exceeded, there may not exist a necessity to contribute to their savings as much anymore. (Rha *et al*. 2006) Yuh's and Hanna's findings showed that the highest predicted probability of saving occurs among individuals under the age of 30 years, with the predicted probability generally decreasing with age (Yuh, Hanna 2010).

1.3. Behavioural traits and preferences

Although, there have been previously found links between different behavioural traits, preferences and values and the financial behaviour of an individual, in current study the focus is mostly set on impulsivity and time-preferences, or more precisely, on materialism, optimism, self-control and the experience of saving money in childhood.

It has been discovered that the habit of money management in individuals, which itself is related to increased savings, decreased debt and reduced compulsive buying, is indirectly influenced by Big Five personality traits, which are openness, conscientiousness, extraversion, agreeableness and neuroticism. Some studies have found that practicing money management strategies, can be linked to individuals being less materialistic (Walker 1996; Gardarsdottir, Dittmar 2012) because materialism tends to, for example, drive individuals towards taking on greater levels of debt (Ponchio, Aranha 2008; Watson 2003) and making more compulsive purchases (Dittmar 2005).

In this case, one theory to explain the relationship between materialism and saving behaviour, is the escape theory. According to the escape theory, individuals may experience negative psychological reactions when they realise that they do not match their own standards and expectations that they have set based on, for example, people with higher socioeconomic backgrounds. These negative reactions may lead to irrational behaviour, like pursuing happiness through material possessions (Richins, Dawson 1992), and therefore resulting in unsound financial decisions. Additionally, materialists may avoid checking upon their finances, as their rather poor financial position may bring forth negative emotions that they are trying to avoid (Donnelly *et al*. 2012).

Other studies have stated that increased savings are related to conscientiousness, because conscientious individuals are more inclined to have financial self-control (Rha *et al*. 2006) and positive attitudes (Donnelly *et al*. 2012). Besides the ability to manage one's money by creating and following budget for example, there are certain life skills that enable the ability to manage one resources effectively, such as self-control (Moffitt *et al*. 2011). One of the ways to for an individual to practice self-control, is by setting certain saving goals and rules, which simplify inducing continuous saving habits and therefore, making it easier to put money aside regularly (Rha *et al*. 2006).

The relationship between optimism and saving habits has been widely debated. According to Puri's and Robinson's research (2007), the link between optimism and financial habits may differ depending on the level of optimism an individual may have. For example, moderate optimism can be associated with having saving habits, planning one's financial actions and not having significant credit card debt. However, when it comes to extreme optimism, then this can result in putting less money aside, as this quality may result in overconfidence and therefore also in imprudent financial decisions. They also find that moderate optimists have overall more self-control. In conclusion,

difference between moderate optimism and extreme optimism does exist, when it comes to optimism having effect on financial habits, and this is consistent with evidence from previous studies, that over-optimism may lead to irrational financial behaviour. (Puri, Robinson 2007)

On the one hand, it has been found based on dataset derived from 1995-2007 Survey of Consumer Finances, that having overall optimism regarding individuals own life expectancy and wealth, as well as future economy, the person is more inclined to practice good saving habits, than compared to peers who may be more pessimistic (Lim *et al.* 2011). But on the other hand, Brunnermeier and Parker (2005) discovered that when it comes to making financial decisions, optimists may incline towards riskier decisions with potential negative consequences as they have more positive outlook in general and are not as worried about the future. Consequently, this may lead to lower savings levels and loss of wealth when they are exposed to risks. (Brunnermeier, Parker 2005) It seems that, as Puri and Robinson presented in their study too, if optimism achieves higher levels and creates an effect of over-confidence, then individuals do not practice saving habits which such care (Pirinsky 2013).

Some studies have found a positive correlation between the parental teaching and encouraging their children to save money in childhood and their children's level of financial literacy (Grohmann, Menkhoff 2015), as well as between parents' own saving routine and children's saving habits in adulthood (Peng *et al*. 2007). In fact, individuals generally tend to name their parents when it comes to their financial habits and skills (Danes 1994).

It is found that possession of financial assets and better financial position in adulthood is linked to having a savings account as a child and supportive parents who taught how to budget (Jinhee, Chatterjee 2013), as it has its influence on the level of financial literacy that these individuals develop. On top of that, parents act as role models to their children which means that they are daily observed by the financial decisions and actions they make which eventually have an impact on how their children develop financial skills and knowledge that they carry on to (younger) adulthood. Therefore, it is utmost important that parents do not only allow children to make financial decisions under surveillance but also set themselves an example and work together with their children on setting saving goals and working on developing other positive (financial) habits. (Drever *et al*. 2015) Nevertheless, learning money management skills in childhood is not only about social learning and direct teaching but also about how children principally were brought up and what are their attitudes, values and characteristics in general (Otto 2013).

To conclude, there is some evidence from earlier studies, that prove a positive correlation between households' habits to save money as well as manage one's money in general and one of the following traits: whether its materialism, common level of optimism, the ability to control oneself or growing up with parents who set a positive example of how to create saving habits and induce those habits among their children.

1.4. Personal savings in the United States

The financial crisis of 2008 highlighted very effectively the significance of household finance in the economy in general, as one of the main reasons for downturn was the subprime mortgage market that involved, being one of the many triggers for the crisis, poor decision making by consumers (Tufano 2009). Furthermore, the reality of the difference of the financial decisions made by households compared to neoclassical economic models and theory of optimal consumer choices and behaviour, has become more evident (Campbell 2006).

In 1957, Friedman wrote: "Estimates of savings in the United States made by Kuznets for the period since 1899 revealed no rise in the percentage of income saved during the past half-century despite a substantial rise in real income. According to his estimates, the percentage of income saved was much the same over the whole of the period." (Friedman 1957, 3-4).

Since 1959 until the financial economic crisis, the levels of mortgage and consumer debt have significantly increased (Tufano 2009), whereas the saving rate has inversely decreased, as can be seen on Figure 1. for the saving rate. One of the reasons for such a decrease in saving rate since 1980s might have been the broader accessibility to the use of credit cards which has had a comprehensive effect on consumer spending (Hirschman, 1979; Feinberg, 1986; Prelec, Simester 2001; Agarwal *et al*. 2017). In addition to that, another reason could have been the easier accessibility to better loan terms on mortgage debt (Brady *et al*. 2000; Canner *et al*. 2002; Greenspan, Kennedy, 2008; Agarwal *et al*. 2017). After the financial crisis saving rate has took a turn and began to increase again but still remains on quite equal level in the recent years. Post 2008 the value of retirement savings account, for example like 401(k) accounts and Individual Retirement Accounts (IRA), has increased significantly and made all-time records (Rhee, Boivie 2015).

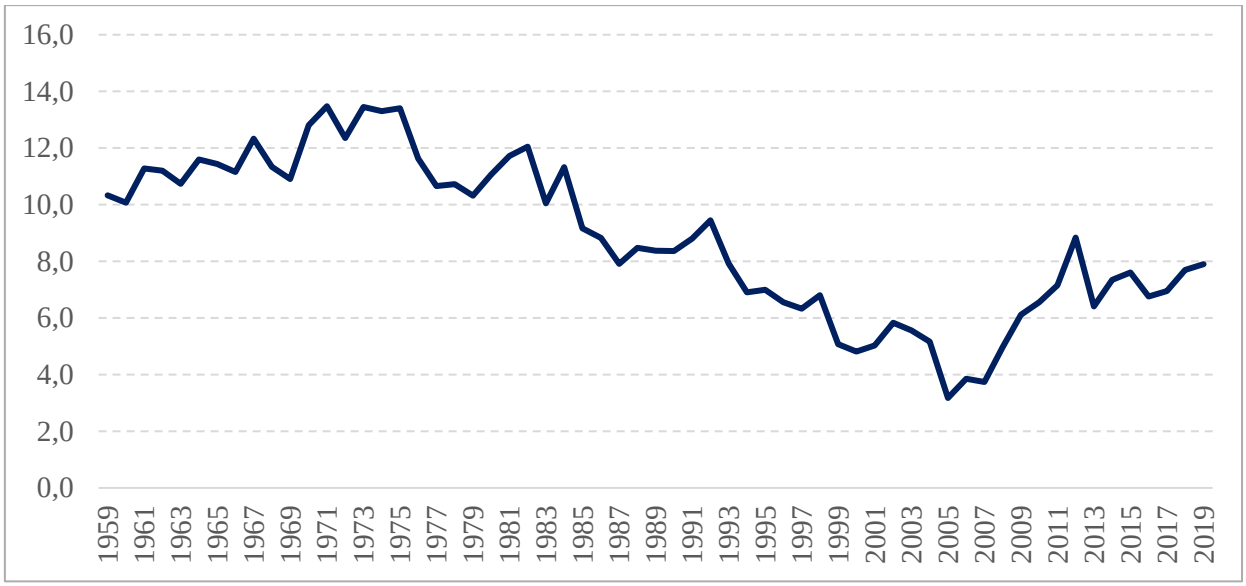

Figure 1. Personal Saving Rate in 1959-2019 in the United States.
Source: U.S. Bureau of Economic Analysis.

Since 2013 the Board of Governors of the Federal Reserve System has annually conducted surveys and published reports on the economic well-being of United States households with an aim of monitoring the financial and economic status of households. One of the areas of the survey has focused on investigating the relationship between households' income and savings level and their ability to cover unexpected expenses.

The survey focused on the relationship between income and savings level in 2015 (Larrimore, *et al.* 2016) and 2016 (Larrimore *et al.* 2017) when results were quite similar. For example, in both years, 31% of respondents reported that their income level and spending amounts were equal. When it comes to emergency expenses, then from 2013 until 2016 respondents reported of their ability to cover three months of expenses by having a rainy day or emergency expenses fund (Schmeiser *et al.* 2014; Larrimore *et al.* 2015; Larrimore *et al.* 2016; Larrimore *et al.* 2017). In 2013, 61% of respondents reported that they would not be able to cover three months of expenses (Schmeiser *et al.* 2014), and the percentage of respondents decreased every year, achieving the level of 52% of respondents reporting the aforementioned in 2016 (Larrimore *et al.* 2017).

Another way of measuring the ability of the survey respondents to cover emergency expenses was by requesting them to evaluate whether they would be able to easily cover $400 of emergency expenses by using cash or its equivalent. Results from years of 2013 until 2018 can be observed in Figure 2., according to which, the proportion of respondents who are able to cover sudden expenses, has risen 11% over the years (Durante, Chen 2019).

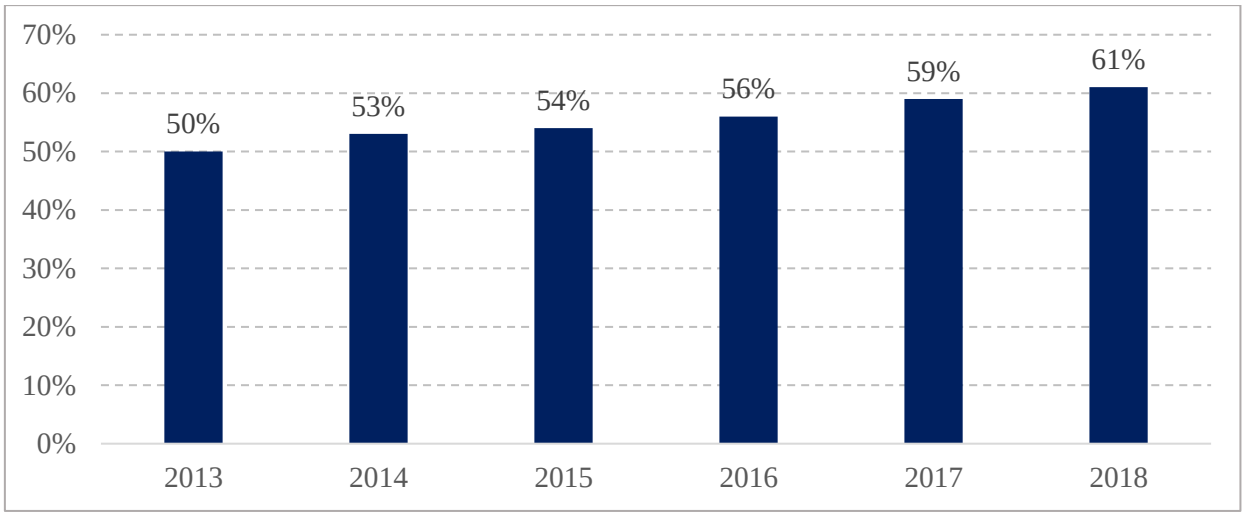

Figure 2. Share of U.S. adults who would cover a $400 emergency expenses using cash or its equivalent
Source: Durante, Chen (2019)

Results from the survey over the years indicate that households with a lower-income level were not as likely to set some savings aside, meaning that the savings behaviour of households is substantially affected by their level of income and, additionally, by the volatility of the income (Schmeiser *et al.* 2014; Larrimore *et al.* 2015; Larrimore *et al.* 2016; Larrimore *et al.* 2017; Larrimore *et al.* 2018; Durante, Chen 2019). However, we must consider that households' income is only one of the socio-economic factors that may have a link to households' saving behaviour.

2. METHODOLOGY

2.1. Data and sample

The empirical study is based on a representative cross-sectional data from the United States. The data was collected in 2016 in the course of the National Financial Well-Being Survey (NFWBS). The survey was conducted by the Consumer Financial Protection Bureau with a purpose of defining and measuring the individuals' financial well-being. (Consumer Financial Protection Bureau 2017)

The survey sample was drawn from the GfK KnowledgePanel members to ensure the representation of the adult U.S. population of 50 U.S. states and District of Columbia. Survey was conducted in English and Spanish via web mode between October 27, 2016 and December 5, 2016 and overall achieved a sample of 6,394 complete records. The dataset contains 217 variables which also include measures of behavioural characteristics, preferences and values, socio-economic factors and many more. (*Ibid*.)

Prior to the analysis, the data was wrangled. First, in order to restrict the sample to respondents who are involved in taking care of financial decisions within a household, the variable "MANAGE2" was restricted to options "Someone else and I take care of money matters in my household about the same" and "I take care of all or most money matters in my household", therefore leaving out the option "Someone else takes care of all or most money matters in my household". This leaves the sample with 5,514 respondents who reflect their behavioural traits within the survey answers but are also aware of or make themselves the financial decisions within a household. Secondly, some variables were recoded, for futher data analysis and creation of own variables, to meet the aim of the thesis and test hypotheses set beforehand. The changes that were made are described more in depth in the next chapter.

2.2. Overview of variables

2.2.1. Dependent variable

The study relies on two related measure of savings, a ratio of savings to income, which is a continuous variable, and level of savings in USD, which is an ordinal variable that is used further in the robustess analysis.

The continuous dependent variable *savings_to_income* has been created based on two different original variables, the amount of savings households have set aside and the level of income they earn in a year. The first variable is "SAVINGSRANGES", which measures how much money respondents had in their savings at the time of filling in the survey. This variable is labeled as *savings_levels* in the current study and consists of the following seven categories of savings levels: 1) 0 USD; 2) 1 to 99 USD; 3) 100 to 999 USD; 4) 1,000 to 4,999 USD; 5) 5,000 to 19,999 USD; 6) 20,000 to 74,999 USD; 7) 75,000 USD or more. The mean of the variable is 4.5 and median 5.0, indicating, that on average households have their savings in a range of 1,000 to 19,999 USD and the median amount of savings falls between 5,000 to 19,999 USD.

Second original variable, is "PPINCIMP" which measures the level of individual's annual income and consists of nine different categories of income levels: 1) Less than 20,000 USD; 2) 20,000 to 29,999 USD; 3) 30,000 to 39,999 USD; 4) 40,000 to 49,999 USD; 5) 50,000 to 59,999 USD; 6) 60,000 to 74,999 USD; 7) 75,000 to 99,999 USD; 8) 100,000 to 149,999 USD; 9) 150,000 USD or more. On the average, the annual income of individuals falls inbetween of 50,000 to 74,999 USD, as the mean of the variable is 5.7, and the median 6.0 of annual income falls in the range of 60,000 to 74,999 USD.

Since both of these variables are ranges then for every category the median number has been calculated and further used in the computation of ratio of savings to income. This ratio is widely discussed within personal finance and provides therefore a relevant way of how to measure houdseholds' savings. *Savings_to_income* shows that households have set aside savings that on average make up 28.2% of their annual income. The variable *savings_to_income* was also modified by eliminating the 2% of values at the top of the distribution in order to remove the outliers. The modifications leaves us with a further smaller sample of 4,469 respondents and allows to use this variable in regression models.

Furthermore, in order to test the outcome with another method and conduct a robustness analysis, the original variable "SAVINGSRANGES" is used to perform ordered logit regression analysis. This dependent variable, in this study labeled as *savings_levels*, is an ordered discrete variable.

2.2.2. Socio-economic variables

The independent variables used in the base model are *age, gender, education, proxy_income, homeowner, race, household_size, kids, health, employment, support, shock_absorbtion, shock_events, poor_county* and *region.* As some of them are factor variables then those given variables are further converted into dummy variables.

Variable *age* is reported on a scale that is divided into eight different groups. *Gender* is treated as binary variable – 0, if male and 1, if female. *Education* is also reported on a scale but from 1 to 5 and consists of following groups: less than high school; high school degree/GED; some college; bachelor's; graduate/professional degree. Variable *education* is transformed further into dummy variables and *less_than_high_school* is used as a reference group. As the original income variable is used to create a dependent variable, then in the base model *proxy_income* has been used instead to represent income in order to avoid possible false results. *Proxy_income* is modified to a reversed average based on two different original scale variables from the dataset: "FWB1_5 I am just getting by financially" and "FWB2_2 I have money left over at the end of the month" which is presented as a reverse scale. In this case, the latter has been reversed, in order for all of the variables' highest values to equally represent the highest income, and later an average of these has been developed.

Variable *homeowner* is modified from the original "HOUSING" scale variable to a binary variable where 1 responds to "I own my home" and 0 to either "I rent" or "I do not currently own or rent". This modification allows to differentiate respondents who are wealthy enough to own real estate and therefore may be more inclined to develop saving habits (Browning, Lusardi 1996). Variables *race* and *region* are both reported on scales of 1 to 4 where options for *race* are from white, black, other to hispanic respectively and for *region* from Northeast, Midwest, South to West respectively. Both of these are further turned into dummy variables. The reference group used for *race* is *White* and for *region* is *Souht.* Household size is reported on a scale as to how many people are included within a respondent's household accordingly.

Another socio-economic variable included in the base model is *kids* which is a binary variable according to whether there are any kids in the household or not. As a next variable, on *health* scale,

higher value of the variable indicates better health of a respondent. For an *employment* variable the scale includes eight different groups of employment status and from this, a dummy variable has also been created. These eight groups consist of self-employed, work full-time (reference group), work part-time, homemaker, full-time student, unable to work, unemployed and retired. Binary variable *support* reflects the respondent's assessment on whether family or friends would borrow him/her money and is created as an average of BORROW_1 and BORROW_2 from original dataset, where answers reflect respectively 1 – yes and 0 – no.

Another binary variable is *shock_absorbtion* which measures whether the respondent has the confidence in ability to raise $2,000 in 30 days where 1 reflects "I could probably" and "I am certain I could" and 0 reflects "I could probably not" and "I am certain I could not" from the initial dataset. Variable *shock_events* is based on the sum of eleven different binary variables labeled "SHOCKS" from the original dataset where individuals have assessed whether they have been in certain situations that could put a strain on their finances, or not. In this case, the higher the value of the variable, the more shocking events that have influenced the household's wealth negatively, correspondent has experienced. These events include for example losing a job, having a health emergency, getting a divorce, etc. Binary variable *poor_county* is derived directly from the initial dataset as is, where the variable "PCTLT200FPL" takes into account the county where according household is located and then determines whether the household resides in a county where less than 40% or 40% or more of county population is below 200% of poverty level based on the results of American Community Survey (ACS) that reflect the data from years 2014-2018.

2.2.3. Behavioural variables

For testing the hypotheses and meeting the aim of the research (explain how behavioural characteristics affect the savings) a set of behavioural proxies was constructed.

The first hypothesis states that individuals with moderately optimistic attitudes are likely to save more. In order to measure the importance of optimism, the underlying variables used from the dataset are "SWB-1 I am satisfied with my life" and "SWB_2 I am optimistic about my future". Both of them are measured on likert scale from strongly disagree (1) to strongly agree (7). The *optimism* variable is therefore constructed based on the average of these two original variables.

Second hypothesis states that individuals who do not emphasise on materialistic values are likely to save more. To measure the relationship between materalism and saving habits, two different

independent variables, *materialism* and *frugality* were created. For *materialism*, once again an average of "MATERIALISM_1 I admire people who own expensive homes, cars and clothes", "MATERIALISM_2 The things I own say a lot about how well I'm doing in life" and "MATERIALISM_3 I like to own things that impress people" has been used. *Frugality,* however, measures the following: "If I can re-use an item I already have, there is no sense in buying something new". Both variables are also measured on a likert scale from strongly disagree (1) to strongly agree (6). Nonetheless, it is important to understand that these two variables, although measuring the same concept, which is materialism, differ from each other, as the highest value of variable *materialism* indicates a high appreciation of materiliastic values but the highest value of variable *frugality* indicates that materialistic values are not characteristic for an individual.

The third hypothesis focuses on the effect of self-control. As previous literature and studies have shown, self-control is indicated to influence having more savings. To study this link, five different variables have been used within the regression analysis, more specifically self-control, self-control exerted in financial domain, financial planning, waiting tendency as a proxy for time preferences, and a measure of psychological connectedness.

Firstly, *selfcontrol*, which is comprised as an average of the following proxies: SELFCONTROL_2 I am good at resisting temptation", "SELFCONTROL_3 I am able to work diligently toward long-term goals" and measured on likert scale from not at all (1) to completely well (4). Secondly, *fin_selfcontrol,* to measure individuals self-control that is specifically related to financial activities and decisions. This variable is also created as an average of five initial variables: "PROPPLAN_1 I consult my budget to see how much money I have left", "PROPPLAN_3 I set financial goals for what I want to achieve with my money", "PROPPLAN_4 I prepare a clear plan of action with detailed steps to achieve my financial goals", "ACT1_1 I follow-through on my financial commitments to others", "ACT1_2 I follow-through on financial goals I set for myself". All of these are measured on a likert scale of five. Thirdly, to also consider the financial planning time horizon the "SCFHORIZON" was used where likert scale is divided into five following points: (1) the next few months; (2) the next year; (3) the next few years; (4) the next 5 to 10 years; (5) longer than 10 years. Fourthly, a binary variable *waiting_tendency* measures time preferences by evaluating whether the respondent would receive $816 now (0) or $860 in three months (1), as it is an important aspect that may have its influence on the households decision to save (Wang *et al*. 2016). And finally, *future_self*, to measure the psychological connectedness, as Hershfield *et al.* (2011) have written that the easier and better an individual is able imagine themselves in the future,

the more he/she is willing to help the future version of him-/herself and therefore, it can be interpreted, that an individual could save more resources today to have a better life in the future. This is measured based on a variable "CONNECT" where respondent is asked to rate the degree of connectedness between the person they expect to be in five years compared to the person they are now, where 0 means "I will be completely different in the future" and 100 means "I will be exactly the same in the future".

Fourth hypothesis states that individuals whose parents fostered them knowledge of financial well-being in childhood are likely to save more. This relationship is measured by variable *finvalues_parents* that is a sum of four following binary variables: "FINSOC2_1 Discussed family financial matters with me", "FINSOC2_2 Spoke to me about the importance of saving", "FINSOC2_3 Discussed how to establish a good credit rating" and "FINSOC2_7 Provided me with a savings account". In this case, higher value presents more evidence of financial well-being being fostered in childhood by the respondents parents.

For a more compendious overview of the variables that were described beforehand and used both in the OLS regression analysis and later in the robustness analysis, please see Table 1 below. For an overview of the variables and their descriptive statistics, please see Appendix 1. The correlation matrixes between the variables is presented in Appendices 2-4.

Table 1. Predictors used in the OLS regression model.

Variable	NFWBS	Explanation
Base model		
age	agecat	1 to 8, higher value = higher age
gender	PPGENDER	Binary: 0 - male, 1 - female
education	PPEDUC	5 groups, dummy variables
proxy_income	FWB1_5; FWB2_2	Reversed average, higher value = higher income
homeowner	HOUSING	Binary: 1 - owns home, 0 - does not own
race	PPETHM	1 - White, 2 - Black, 3 - Other, 4 - Hispanic, dummy variables
household_size	PPHHSIZE	1 to 5, higher value = bigger household
kids	KIDS_NoChildren	Binary: 1 - has kids, 0 - no kids
health	HEALTH	1 to 5, higher value = better health
employment	EMPLOY	8 groups, dummy variables
support	BORROW_1; BORROW_2	Binary, 1 - yes, 0 - no
shock_absorbtion	ABSORBSHOCK	Binary, 1 - yes, 0 - no
shock_events	SHOCKS_1 to SHOCKS_11	1 to 11, higher value = more shocks
poor_county	PCTL200FPL	Binary, 1 - less than 40%, 0 - 40% or more of county population below 200% of poverty level
region	PPREG4	1 - Northeast, 2 - Midwest, 3 - South, 4 -West, dummy variables
H1: optimism		
optimism	SWB_1;SWB_2	1 (strongly disagree) to 7 (strongly agree)
H2: materialism		
materalism	MATERIALISM_1 MATERIALISM_2 MATERIALISM_3	1 (strongly disagree) to 5 (strongly agree)
frugality	FRUGALITY	1 (strongly disagree) to 6 (strongly agree)
H3: self-control		
selfcontrol	SELFCONTROL_2 SELFCONTROL_3	1 (not at all) to 4 (completely well)
fin_selfcontrol	PROPPLAN_1 PROPPLAN_3 PROPPLAN_4 ACT1_1; ACT1_2	1 to 5, higher value = better self-control
time_horizon	SCFHORIZON	1 to 5, higher value = longer period
waiting_tendency	DISCOUNT	Binary, 1 - $860 in three months, 0 - $816 now
future_self	CONNECT	0 (completely different in the future) to 100 (exactly the same in the future)
H4: childhood		
finvalues_parents	FINSOC2_1; FINSOC2_2 FINSOC2_3; FINSOC2_7	1 to 4, higher value = more financial knowledge in childhood

Source: Compiled by the author based on NFWBS data.

2.3. Model and regression analysis

In the main part, OLS model with robust standand errors and a continuous dependent variable is used to test the hypotheses. Therefore, a general multiple linear regression model is used to construct the regression analysis (Gujarati 2011):

$$Y_i = B_1 + B_2X_{2i} + B_3X_{3i} + \cdots + B_kX_{ki} + u_i. \quad (2.3.1)$$

The dependent variable *savings_to_income* was created based on the relationship of two different original variables: "SAVINGSRANGES" that reflects the amount of savings, and "PPINCIMP" that reflects the annual income. Therefore, the dependent variable reflects the ratio of savings to income.

Later, in the framework of robustness analysis, ordered logit regression analysis was conducted with an ordinal dependent variable, following the formula (Gujarati 2011):

$$\Pr(Y_i \leq j) = \Pr\left(B_1X_{1i} + B_2X_{2i} + \cdots + B_kX_{ki} + u_i \leq a_j\right). \quad (2.3.2)$$

The dependent variable used is *savings_levels*, that is an original variable "SAVINGSRANGES" derived from the dataset. For both, OLS and ordered logit models, the structure of the regression analysis is similar when it comes to the order of how models were created and what independent variables they included.

The base model consists of the following socio-economic variables: *age, gender, education, proxy_income, homeowner, race, household_size, kids, health, employment, support, shock_absorbtion, shock_events, poor_county* and *region.* For variables *education, race, employment* and *region* dummy variables have been created. The reference groups are respectively *Less_than_highschool*, *White, Work_full_time* and *South.* Base model includes socio-economic variables that explain saving decisions according to the previous literature and is then complemented with behavioural variables.

Further on, to measure the impact of behavioural variables on households' saving habits, the variables were entered sequentally into model based on the hypotheses. Starting from Model 2, the independent variable *optimism* was added to test the first hypothesis that aims to test the relationship between optimistic attitude and savings. For Model 3, independent variables *materialism* and *frugality* were added to test the link between materialistic values and propensity

to save. For Model 4 five proxies were added to test the third hypothesis that states the possibility of a household having more savings when self-control exists. These variables were *selfcontrol, fin_selfcontrol, time_horizon, waiting_tendency* and *future_self.* For testing the fourth hypothesis and therefore, the relationship between having parents who taught about financial well-being in childhood, Model 5 was created by adding an independent variable *finvalues_parents*. Model 6 consists of behavioural proxies that showed statistical significance in the previous models. As the existance of statistically non-significant predictors in the model improved the independent variables' ability to explain the observed variation within the dependent variable then for the final model, Model 7, all of the predictors from models 2 to 5 were added to the base model to best describe the effect of behavioural factors on the amount of households' savings.

The final multiple linear regression model according to the multiple linear regression formula is as follows:

$$Y_i(savingstoincome)=f(socioeconomic\ variables_i; behavioural\ variables_i) \qquad (2.3.3)$$

where socio-economic variables act as control variables and behavioural variables measure dependent variable *savings_to_income.*

Both final models, OLS and ordered logit regressions, were further tested for multi-collinearity with variance inflaction factor (VIF), for heteroskedasticity with White's and Breusch-Pagan tests and also, non-linearity and normality of residuals was checked. Both of the regression analyses were ran with robust standard errors in order to account for heteroskedasticity.

Regression analyses were conducted in Gretl software.

3. EMPIRICAL RESULTS

The aim of this chapter is to give a detailed overview of the results from the cross-sectional study that was conducted with OLS with robust standard errors based on a dataset derived from NFWBS. The continuous dependent variable used for creating OLS regression analysis was *savings_to_income.* Final model includes both socio-economic and behavioural variables. This cross-sectional study was conducted with an aim of extending the literature on the relationship between savings behaviour and behavioural traits of households. The behavioural factors under observation were optimism, materialism, self-control and financial knowledge and habits accumulated in childhood based on parental upbringing.

For both base and final models some additional procedures were performed. According to VIF-test there is no multicollinearity present. However, according to White's and Breusch-Pagan's tests, heteroskedasticity is present. This has been accounted for by using robust standard errors while conducting regression analysis. It also appears that the model fails tests for non-linearity. This in conclusion may indicate problems with linearity that are addressed in robustness analysis.

3.2. Results from the base model

Base model (Table 2.; Appendix 6.) was created with socio-economic variables as these are the characteristics that influence savings behaviour in a wide manner. The base model of OLS regression analysis therefore includes *age, gender, education , proxy_income, homeowner, race, household_size, kids, health, employment, support, shock_absorbtion, shock_events, poor_county* and *region.* Author has treated *education, race, employment* and *region* as dummy variables. The reference groups are respectively *Less_than_highschool, White, Work_full_time* and *South.* Current base model includes 3,684 observations with a continuous dependent variable *savings_to_income*. Model itself is statistically significant at the level of 1% and explains about 27.4% of the observed variation.

OLS regression analysis shows that statistically significant predictors on 1% level are *age, proxy_income, household_size, shock_absorbtion.* Statistically significant on 10% level are independent variables *kids, health* and *poor_county.* However, the following variables in the base model are not statistically significant at all and therefore do not have an effect on savings within this range of study: *gender, homeowner, support, shock_events.* When observing dummy variables then categories of *region* are statisticially insignificant predictors, except for *West*. From *race* categories *Black* and *Other* (non-Hispanic) show significance at 1% and 5% level respectively but *Hispanic* does not show any. The only statistically significant category from *education* is *High_school* and it is on the level of 1%. All of the categories of *employment* show statistical significance on different levels, except dummy variable *Unable_to_work.* There is a positive correlation between the dependent variable and the following statistically significant predictors: *age, proxy_income, health, shock_absorbtion, High_school, Other, Self_employed, Work_part_time, Homemaker, Fulltime_student, Unemployed* and *Retired. Household_size, kids, poor_county, Black, Northeast* and *Midwest* have a negative association with *savings_to_income*.

The average age of a respondent falls between 45 to 54-year-old, and the positive coefficient indicates that an older an individual becomes, the higher the savings to income ratio becomes. If an individual reaches the age of 55 to 64-year-old then his/her savings to income ratio increases 2.5 percetange points. The mean of 3.3 of the variable *proxy_income* shows a position on a 5 point likert scale where higher value indicates higher income. Based on the coefficient of *proxy_income,* one can conclude that a rise of 1 point on the scale results in a 8.8 percentage point increase in savings to income ratio. As variable *shock_absorbtion* shows the ability to raise $2,000 in 30 days, then the positive coefficient indicates that a rise in confidence results in 13.1 percentage point increase in savings to income ratio. Both of these variables, *proxy_income* and *shock_absorbtion,* indicate that an increase in income results in an increase in savings and this is in line with previous literature and the results from surveys conducted by Board of Governors of the Federal Reseve System. However, when there is an increase of 1 unit in size of a household, then the savings to income ratio decreases 2.3 percentage points. From the perspective of having children, compared to not having them, the savings to income ratio decreases by 2.2 percentage point. Similar results regarding children and savings levels have been indicated also in earlier studies (Love 2010). When it comes to health, the average health of a respondent is rated as good but in a situation where health conditions would rise to the level of very good, the ratio of savings to income would rise 1.1 percentage point. Independent variable *poor_county* indicates that when a respondent lives in a county where 40% or more population within a county is below 200% of poverty level then

this respondent's savings to income ratio is 2.3 percentage point lower than for a respondent who lives in a county where less than 40% of county population is below 200% of poverty level. This is not in line with previous literature and the outcome was not expected.

Table 2. The OLS regression Base model.

	coefficient	std.errors	p-value
const	-0.262	(0.039)	***
age	0.025	(0.004)	***
gender	-0.002	(0.011)	
proxy_income	0.088	(0.005)	***
homeowner	0.004	(0.013)	
household_size	-0.023	(0.005)	***
kids	-0.022	(0.013)	*
health	0.011	(0.006)	*
support	0.002	(0.016)	
shock_absorbtion	0.131	(0.014)	***
shock_events	0.001	(0.005)	
poor_county	-0.023	(0.013)	*
High_school	0.086	(0.024)	***
Some_college	0.016	(0.023)	
Bachelors	0.030	(0.025)	
Graduate	0.012	(0.026)	
Black	-0.059	(0.020)	***
Other	0.065	(0.025)	**
Hispanic	-0.007	(0.018)	
Self_employed	0.037	(0.019)	*
Work_parttime	0.044	(0.023)	*
Homemaker	0.083	(0.022)	***
Fulltime_student	0.082	(0.038)	**
Unable_to_work	0.023	(0.025)	
Unemployed	0.120	(0.038)	***
Retired	0.120	(0.019)	***
Northeast	-0.025	(0.015)	*
Midwest	-0.024	(0.015)	*
West	-0.016	(0.013)	

N: 3,684. Adj. R2: 0.274

Source: Author's calculations based on NFWBS data.
Notes: *p<0.1; **p<0.05; ***p<0.01. The model is OLS regression base model with robust standard errors and with a continuous dependent variable *savings_to_income.*

When observing the dummy variables, the results indicate that having high school education results in 8.6 percentage points higher savings to income ratio than when having lower level of education. Going on, savings to income ratio is higher for *Other* (Non-Hispanic) by 6.4 percentage

point and lower for *Black* by 5.9 percentage point than it is for *White* ethnicity. For all of the statistically significant *employment* groups the savings to ratio income is higher than for the reference group *Work_full_time.* This may be due to the reference group most likely having a higher income than other *employment* groups which therefore lowers the value of the ratio. Compared to the most densely populated region in the United States, the *South,* savings to income ratio is lower for respondents who are located in either *Northeast* or *Midwest*, by 2.5 and 2.4 percentage points respectively. In this case, for the reference group, incomes are rather lower in the *South* region compared to previously mentioned regions (United States Census Bureau referenced in Peter G. Peterson Foundation … 2019).

3.3. Results from the interim models

Interim models are models inbetween of base model and final model where number of behavioural variables have been inserted sequentally in order to test different hypotheses set in the early stages of the study. Within these models, additionally to base model variables, *optimism, materialism, frugality, selfcontrol, fin_selfcontrol, time_horizon, waiting_tendency, future_self* and *finvalues_parents* have been added consecutively according to the hypotheses they are meant to measure. Results from interim models can be found in Appendix 5.

In order to test the first hypothesis, *optimism* was added to the model (Model 2). Statistically significant socio-economic independent variables from the base model do not show any changes, except for variable *health,* that is now statistically significant on 1% level, whereas before it was on 10% level, and none of the statistically non-significant predictors have become significant. *Optimism* variable itself indicates a negative relationship with savings while being statistically significant on the level of 1%.

In Model 3, proxies for materialism were added: *materialism* and *frugality.* When observing the statistically significant predictors from base model, it seems that variables *kids* and *health* are no longer statistically significant. Similarly, the level of statistical significance of variable *Other* has changed from 5% significance level to 1%, and *Northeast* from 10% to 5% level. However, both of the added proxies for materialism themselves are statistically significant, and both of them have positive correlation with the dependent variable.

Nevertheless, the positive correlation for both of these variables has a contradictory meaning which has been further explained within the final model.

Model 4 is used to test the third hypothesis where behavioural variables like *selfcontrol, fin_selfcontrol, time_horizon, waiting_tendency* and *future_self* have been added. As in the previous model, variables *kids* and *health* are no longer statistically significant but also *Midwest* is no longer. Some of the statistical significance levels have changed for *Black, Other, Self_employed, Work_parttime, Fulltime_student* and *Northeast* but stay continually statistically relevant. Only two of the behavioural variables, *time_horizon* and *waiting_tendency* are statistically significant with a positive correlation with savings to income ratio. This means that proxies *selfcontrol, fin_selfcontrol* and *future_self* within this model are not able to measure the relationship between time preferences and savings.

For the final hypothesis *finvalues_parents* has been added to Model 5 to measure the relationship between financial knowledge aggregated from parents during individual's childhood and savings to income ratio which between the two is positive and the proxy itself is statistically significant on 5% level. Although, the statistical significance of most of the socio-economic variables stays the same as in the base model, once again, predictors *kids* and *health* have become irrelevant in this case.

Model 6 was created with a purpose of gathering together within a one model all of the behavioural variables from the prior models that showed statistical significance. However, as the model that also contains behavioural predictors that were not statistically significant previously is able to explain better the observed variance, then therefore, for the final model all of the socio-economic and behavioural variables have been added. The final model and the relationship between savings to income ratio and statistically significant behavioural predictors has been further described in more depth in the following chapter.

3.4. Results from the final model

Final model (Table 3., Appendix 7.) includes socio-economic variables from the base model and behavioural variables from the intermediate models that were conducted sequentially to test every hypothesis, and which are the following: *optimism, materialism, frugality, selfcontrol,*

fin_selfcontrol, time_horizon, waiting_tendency, future_self, finvalues_parents. Author has treated *education, race, employment* and *region* as dummy variables. The reference groups are respectively *Less_than_highschool, White, Work_full_time* and *South.* The final model ran with OLS regression analysis with robust standard errors includes 3,569 observations with a continuous dependent variable *savings_to_income*. Model itself is statistically significant with a *p-value* of 1% and the model explains about 28.7% of the observed variation.

The socio-economic variables *age, proxy_income, household_size* and *shock_absorbtion* have remained statistically significant as they were in the base model, and all of them are statistically significant on the 1% level as before. However, variables *kids* and *health* have now changed. In the base model, variable *kids* was statistically significant on 10% level but in the final model this variable is not a significant predictor of the savings to income relationship anymore. Predictor *health* which was also statistically significant on 10% level is now significant on 5% level. Additionally, when observing the dummy variables, although most of the results have stayed the same, there are still some changes. For example, predictor *Midwest* is no longer statistically significant. At the same time, *Self_employed* and race *Other* have become more statistically significant whereas *Black* is now less statistically significant. As mentioned hereinbefore, the statistically significant behavioural predictors in the OLS regression model were *optimism, materialism, frugality, time_horizon, waiting_tendency* and *finvalues_parents.* Therefore, the null hypothesis was rejected by 6 out of 9 behavioural variables and *selfcontrol, finselfcontrol* and *future_self* were first left out due to their insignificance. Author then decided to keep the insignificant behavioural predictors in the model as they apparently strenghten the relationship between the model and the dependent variable, eventhough the change is quite minor.

While *finvalues_parents* was statistically significant on 10% level and *materialism* and *frugality* on 5% level, the other predictors, *optimism, time_horizon* and *waiting_tendency*, were significant on 1% level. Positive correlation exists between dependent variable *savings_to_income* and all the behavioural independent variables, except for *optimism.* On average, respondents have rated themselves with having optimism level of 5.4 on a 7-point likert scale. Therefore, in the case of optimism, the negative coefficient indicates that with a 1 unit rise in the level of optimism, the ratio of savings to income decreases 1.9 percentage point.

Table 3. The OLS regression Final model.

	coefficient	std.errors	p-value
const	-0.440	(0.057)	***
age	0.027	(0.004)	***
gender	0.004	(0.011)	
proxy_income	0.083	(0.006)	***
homeowner	-0.007	(0.013)	
household_size	-0.021	(0.007)	***
kids	-0.016	(0.013)	
health	0.014	(0.007)	**
support	-0.004	(0.016)	
shock_absorbtion	0.112	(0.014)	***
shock_events	0.002	(0.005)	
poor_county	-0.020	(0.013)	
High_school	0.083	(0.024)	***
Some_college	0.007	(0.023)	
Bachelors	0.016	(0.025)	
Graduate	-0.006	(0.026)	
Black	-0.039	(0.021)	*
Other	0.066	(0.025)	***
Hispanic	0.009	(0.019)	
Self_employed	0.040	(0.019)	**
Work_part_time	0.042	(0.024)	*
Homemaker	0.074	(0.022)	***
Fulltime_student	0.079	(0.039)	**
Unable_to_work	0.014	(0.027)	
Unemployed	0.117	(0.041)	***
Retired	0.123	(0.020)	***
Northeast	-0.036	(0.015)	**
Midwest	-0.024	(0.015)	
West	-0.018	(0.013)	
optimism	-0.019	(0.005)	***
materialism	0.016	(0.006)	**
frugality	0.015	(0.006)	**
selfcontrol	0.015	(0.011)	
fin_selfcontrol	0.006	(0.009)	
time_horizon	0.019	(0.005)	***
waiting_tendency	0.045	(0.012)	***
future_self	0.001	(0.000)	
finvalues_parents	0.008	(0.004)	*

N: 3,569. Adj. R2: 0.287

Source: Author's calculations based on NFWBS data.
Notes: *p<0.1; **p<0.05; ***p<0.01. The model is OLS regression final model with robust standard errors and with a continuous dependent variable *savings_to_income.*

The coefficient of variable *materialism* shows that an increase of 1 unit level in the level of having materialistic values increases the savings to income ratio by 1.6 percentage point, meaning that more materialistic individuals have a higher savings to income ratio. However, although *frugality* measures also a positive correlation between materialism and savings, then in this case, the correlation has an entirely different and opposite meaning. As the highest value of the variable *frugality* means not appreciating materialistic values and the respondents have rated themselves of not having materialistic values on the 6-point likert scale on 5.3 on average, it means that a 1 unit increase on the level of *frugality,* meaning not appreciating materialism at all, increases the ratio of savings to income by 1.5 percentage point. This finding is very interesting as the two variables measuring the second hypothesis give absolutely averse results.

With possitive correlation were also *time_horizon* and *waiting_tendency* which both are proxies for self-control and indicate that having more self-control and patience results in an increase of savings to income ratio 1.9 and 4.5 percentage points respectively. And finally, *finvalues_parents* was also positively correlated with the dependent variable. On average, respondents' parents used 2 out of 4 possible ways of fostering financial knowledge to their children. The positive coefficient indicates that the savings to income ratio of individuals, who reported themselves among average, is 0.8 percentage point higher compared to individuals whom parents did not discuss financial matters with them at all.

3.5. Robustness analysis

Robustness analysis was mainly conducted with ordered logit regression model with robust standard errors in order to determine whether the results from OLS regression model hold and to provide more certainty regarding the regression outcome and possible interpretations. For ordered logit regression analysis the discrete dependent variable *savings_levels* was used. The final model includes the same variables as in OLS regression model. Variables *education, race, employment* and *region* are treated as dummy variables. The sample is also restricted as it was for OLS model. Overall results have been compared to OLS regression model in order to detect similarities and differences.

Ordinal logit final model (Table 4.) was able to explain 37.5% of the observed variation and the model as a whole is statistically significant. The number of observations was 3,569. When

observing the statistical significance of independent variables one can conclude that overall the results for behavioural variables remain the same as they were in OLS regression model. However, some differences in socio-economic variables can be detected.

For example, when being a homeowner was not statistically significant in linear regression model and the size of a household was, then these two predictors have reversed statistical significance in the ordinal logit model. Also, in OLS final model *health* was a statistically significant predictor and *kids* not, but in logit model it is the contrary. Furthermore, in the ordered logit model all of the *education* variables are statistically significant whereas some groups of *employment* are not when compared to OLS model. In the ordinal logit model predictor *homeowner* has now positive correlation with the outcome, indicating odds of having more savings when an individual owns a house. This model also shows that having lower level of education results in odds of having less savings than with a higher level of education which is in line with previously published findings. Additionally, in logit final model predictor *poor_county* is statistically significant, which was also significant in OLS base model but not in the final model. The relationship with the dependent variable in this case is also negative.

When observing the ordinal logit behavioural predictors (Appendix 8.) and their odds ratios (Appendix 9.) in the final model, one can conclude that the results confirm the findings from the final OLS regression model. In this model, 7 out of 9 behavioural variables rejected the null hypothesis, whereas in OLS model there were 6 variables which rejected the null hypothesis. All of the behavioural variables have a positive correlation with the dependent variable except for *optimism*, in which case, if the level of optimism increases by 1 unit, the odds of having larger amount of savings is 0.91 times less than having smaller amount of savings. In a situation where respondents report being more materialistic, the odds of having more savings than less, is 1.11 times. However, as *materialism* and *frugality* have reverse scales then logit model also provides contradictory results, as according to predictor *frugality* less materialistic people are 1.08 times more likely of having higher amount of savings.

Table 4. The ordinal logit regression Final model.

	odds ratio	coefficient	std.errors	p-value
age	1.257	0.229	(0.025)	***
gender	0.908	-0.096	(0.066)	
proxy_income	2.256	0.814	(0.039)	***
homeowner	1.427	0.355	(0.080)	***
household_size	0.957	-0.044	(0.034)	
kids	0.869	-0.140	(0.083)	*
health	1.049	0.048	(0.044)	
support	0.909	-0.095	(0.094)	
shock_absorbtion	6.167	1.819	(0.116)	***
shock_events	1.019	0.019	(0.033)	
poor_county	0.816	-0.203	(0.080)	**
High_school	1.908	0.646	(0.173)	***
Some_college	2.150	0.766	(0.170)	***
Bachelors	3.544	1.265	(0.177)	***
Graduate	3.838	1.345	(0.182)	***
Black	0.549	-0.600	(0.134)	***
Other	1.507	0.410	(0.156)	***
Hispanic	0.952	-0.049	(0.117)	
Self_employed	1.142	0.133	(0.134)	
Work_part_time	0.989	-0.011	(0.134)	
Homemaker	1.532	0.427	(0.145)	***
Fulltime_student	1.351	0.301	(0.211)	
Unable_to_work	0.555	-0.588	(0.200)	***
Unemployed	1.034	0.033	(0.233)	
Retired	1.148	0.138	(0.114)	
Northeast	1.043	0.042	(0.090)	
Midwest	0.855	-0.157	(0.084)	*
West	1.080	0.077	(0.085)	
optimism	0.911	-0.093	(0.031)	***
materialism	1.112	0.106	(0.040)	***
frugality	1.082	0.079	(0.043)	*
selfcontrol	1.057	0.055	(0.071)	
fin_selfcontrol	1.087	0.083	(0.061)	
time_horizon	1.231	0.208	(0.029)	***
waiting_tendency	1.739	0.553	(0.070)	***
future_self	1.003	0.003	(0.001)	***
finvalues_parents	1.125	0.117	(0.025)	***
N: 3,569. Adj. R2: 0.287				

Source: Author's calculations based on NFWBS data.
Notes: *p<0.1; **p<0.05; ***p<0.01. The model is ordinal logit regression final model with robust standard errors and with a categorical dependent variable *savings_levels.*

Similarly to OLS model, respondents with higher self-control and patience are more likely to have higher savings as odds ratios according to *time_horizon* and *waiting_tendency* are 1.23 and 1.74 respectively. Variable *future_self* does not provide evidence that would be in line with previous studies as it indicates having 1.0 times more likely higher savings the less an individual is able to imagine him-/herself becoming better in the future. However, according to the theory, an individual is more likely to have savings in a higher amount if he/she is able to imagine the future version of him-/herself (Hershfield *et al.* 2011). Odds ratio of predictor *finvalues_parents* indicates individuals being 1.12 times more likely of having higher amount of savings the more their parents used different ways of teaching financial well-being.

In conclusion, results from ordered logit regression model are substantially the same as empirical results from OLS regression model and the relationship between the dependent variable and behavioural significant predictors, that are used to test the hypotheses set within this research, are more or less the same for both regression models. For futher robustness analysis several different models were conducted. For example, OLS final model was also ran with log version of dependent variable to account for non-linearity and as a result the independent variables' ability to explain the observed variation within the dependent variable improved by reaching 44.5%. Although, the results were mostly the same as previously found, then predictor *materialism* was not statistically significant anymore and *fin_selfcontrol* became statistically significant. However, these results universally do not differ from expectations as for every hypothesis set, the null hypothesis is still rejected by at least one predictor. Also, OLS and logit final models were created with non-restricted samples, but in this case, for behavioural variables the results were exactly the same. Finally, OLS final model was also ran without controlling for *proxy_income,* as there might be a risk of this variable including a sense of savings within it. As a result, all of the behavioural variables except for *optimism* became statistically relevant and seven of them indicating an expected correlation with the dependent variable.

Further discussion of the two main final models, conducted with OLS regression and ordered logit regression models, is provided in the next chapter.

4. DISCUSSION

Current chapter aims to explain the results derived from OLS regression analysis and ordered logit regression analysis with robust standard errors that were based on the NFWBS data.

The first hypothesis stated the following: Individuals with optimistic attitudes are likely to save more. In this case, the hypothesis indicates that when an individual has an overall optimistic attitude towards future and is satisfied with his/her life then it is likely that this individual has savings in a larger amount than a person who tends to be rather pessimistic. The results from regression analyses show that based on the NFWBS data and the *optimism* variable created by the author, optimism is a significant predictor of savings within this model and therefore, the null hypothesis is rejected. However, the analysis shows a negative correlation between the two, meaning that higher levels of optimism indicate less savings. The hypothesis was initially set based on earlier findings that moderate optimism can improve the saving habits of a household (Puri, Robinson 2007). Nonetheless, the results from current regression analyses may be true in the case where individuals have extreme optimism that results in over-confidence (Puri, Robinson 2007, Pirinsky 2013) but also when optimism results in taking more risks regarding financial decisions (Brunnermeier, Parker 2005).

The second hypothesis stated that individuals who do not emphasise on materialistic values are likely to save more, i.e., having materialistic values and lifestyle results in less amount of savings as monetary resources are rather spent on things that provide fulfillment for materialistic needs. Previous literature has proven the relationship between materialism and saving habits to be as was stated with the hypothesis. The results from regression analyses show that both predictors, *materialism* and *frugality,* of materialism rejected the null hypothesis. However, only one of the predictors has the correlation with the dependent variable that was expected. While the results from variable *frugalit*y are similar to findings from previous studies then *materialism* predicts the opposite. Higher values of *frugality* mean not having materalistic values and therefore being able

to have savings in a larger amount, whereas higher value of *materialism* indicates that spending money on things to fulfill the materialistic needs of an individual results in more savings.

In order to test the third hypothesis, which stated that individuals with self-control are likely to save more, altogether five different proxies were used to measure the relationship between self-control and the amount of savings household has established. From these five proxies, in OLS regression only two, *time_horizon* and *waiting_tendency,* rejected the null hypothesis, and in ordered logit regression three of them, *time_horizon, waiting_tendency* and *future_self* rejected the null hypothesis. Meaning that the null hypothesis must be recognised due to statistical insignificance of variables *selfcontrol* and *fin_selfcontrol.* The third hypothesis was based on previous literature that has found evidence of self-control influecing saving habits in a positive manner (Shefrin, Thaler 1988, Rha *et al.* 2006).

The statistically significant proxies in OLS regression support the theory as variable *time_horizon* indicates that individuals who plan their finances for a longer period are likely to have more savings and variable *waiting_tendency* indicates that individuals who would rather receive $860 in three months than $816 now, also may have higher amount of savings than individuals who would prefer the opposite. The statistically significant predictor of savings amount in ordered logit model was *future_self* but it did not indicate a correlation that was expected. The results based on this variable present the idea that individuals who believe that in 5 years they will be exactly the same as they are now, are likely to have more savings than individuals who believe that they will be completely different in the future. Previous theory actually indicates that the more an individual is able to imagine him-/herself in the future, the more he/she is willing to put effort in helping the futureself which also therefore includes saving money in order to have more monetary resources in the future (Hershfield *et al.* 2011). In conclusion, two of five variables recognise the null hypothesis, three of five variables reject the null hypothesis, one of three statistically significant variables indicates an opposite relationship with savings as to what has been found in previous literature and two out of three statistically significant variables support the theory.

The fourth hypothesis stated the following: Individuals whose parents fostered them knowledge of financial well-being in childhood are likely to save more. More precisely put, the individuals who have parents who discussed about financial matters during their childhood and guided their children towards positive financial actions, are likely to have higher amount of savings today. This hypothesis was also based on the several previous findings that indicated the aforementioned

circumstances. The variable used to measure this relationship was *finvalues_parents* which rejected the null hypothesis and proved the positive correlation between the predictor and dependent variable to be true. To be more exact, the variable indicates that the more different measures (variable included four different measures) parents used to introduce the idea of financial well-being to their children, the more savings an individual is likely to have today.

In conclusion, based on the results it can be stated that all of the hypotheses set within the frame of this thesis were confirmed, although, the results are not totally in line with the previous literature as the relationship between predictors of savings and savings itself differ to some extent. The NFWBS data used in the OLS and ordered logit regression analyses with robust standard errors states that all of the behavioural predictors, except *self_control* and *fin_selfcontrol,* are influencers of the amount of savings that households have. The three most influential predictors of the amount of savings one can have are *proxy_income, shock_absorbtion* and employment status *Retired.* This is not a surprising finding as socio-economic variables are able to predict a very large part of financial behaviour of households and therefore also saving decisions (Kaustia *et al.* 2019). As the aim of this thesis was to observe the influence of behavioural predictors than the three most influential variables in this case were *optimisim, time_horizon* and *waiting_tendency* which were proxies for optimism and self-control respectively.

CONCLUSION

Behavioural finance has gained great attention mostly in the recent years, as it has proven to be an essential part in explaining the households' financial decisions, that are influenced not only by economic factors but also by behavioural preferences, traits and values. Understanding the underlying factors and causes for these decisions is crucial, as the financial behaviour and decisions of households affect general economy on a large scale.

The aim of this thesis is to explain how behavioural preferences, values, and traits influence households' saving decisions and the amount of savings households have. The main research question is as follows: Do optimism, materialistic values, self-control, and parental influence during childhood affect the saving decisions and the amount of savings? In order to meet the aim of the thesis and provide an answer to the research question, following hypotheses were formulated based on existing theory and prior empirical evidence: individuals (1) with optimistic attitudes, (2) who do not emphasise on materialistic values, (3) with high self-control and (4) whose parents fostered financial knowledge in childhood, are likely to save more.

The aim of the thesis was met by running Ordinary Least Squares (OLS) regression model with robust standard errors and a continuous dependent variable of *savings_to_income* in the main part and confirming the results with ordinal logit regression model with robust standard errors and a categorical dependent variable *savings_levels* in robustness analysis. Within models, socio-economic variables acted as control variables and behavioural variables were used to measure the hypotheses set in the early stage of the study. The results of both regression models were principally very similar.

The outcome of the regression models shows the significance of some socio-economic independent variables and 6 behavioural predictors out of 9. The saving decisions and the amount of savings households have are influenced by the level of optimism they have, implying that higher levels of optimism result in less savings. Optimism has been described as a significant predictor of saving habits in earlier studies as well, the positive effect is usually the result of moderate

optimism, as high levels of optimism may rather result in over-confidence and therefore riskier financial decisions. Secondly, this study finds a link between materialism and households' savings. The implied relationship between variables measuring materialism and savings to income ratio is contradictory, as *materialism* states that materialistic values result in higher savings and *frugality* states the opposite. Therefore, the expected results based on hypothesis and previous literature are only presented by the latter. Thirdly, out of five predictors of self-control, only two of them, *time_horizon* and *waiting_tendency,* are significant in OLS regression model and state that self-control leads to having more amount of savings. In the ordinal logit regression model *future_self* is statistically significant as well but indicates a contradictory correlation between self-control and savings to income ratio. And finally, the statistically significant independent variable *finvalues_parents* implies a positive relationship between having parents who discussed financial matters during individual's childhood and larger amount of savings, therefore rejecting the null hypothesis.

In conclusion, all of the four null hypotheses that measured the relationship between behavioural characteristics and savings amounts of households were rejected in the course of this study based on National Financial Well-Being Survey data. Therefore, this study found that an individual who has higher levels of optimism is likely to save less and an individual who emphasizes on materialistic values may or may not save more. Furthermore, an individual who has self-control and has parents who fostered knowledge of financial well-being in childhood, is likely to save more.

As for this study, using savings to income ratio has been rather a novel approach to measuring the relationship between household savings and behavioural characteristics. Therefore, there is an opportunity of creating more of similar studies with the same kind of dependent variable by using a different dataset in order to gather and analyze more information as to whether there exists a relationship, and what kind of relationship, between the behavioural characteristics and the magnitude of savings. The savings to income ratio should be in that case measured more precisely to result in more definite findings. In addition, there are number of different behavioural traits, values and preferences that need to be measured in order to collect more information as to how these impact the level of households' savings.

KOKKUVÕTE

Kas käitumuslikud omadused mõjutavad säästmisotsuseid? Ameerika Ühendriikide kodumajapidamiste näitel

Marianne Ääro

Käitumisrahandusele on hakatud pöörama enam tähelepanu just viimaste aastate jooksul, sest see on suutnud end tõestada kui vajaliku uurimisvaldkonnana kodumajapidamiste finantsotsuste tegemisel. Need finantsotsused on mõjutatud nii majanduslike tegurite kui ka inimeste eelistuste, uskumuste ning iseloomujoonte poolt. (Illiashenko 2017). Finantsotsuseid ning säästmisharjumusi mõjutavate tegurite mõistmine on aga oluline, sest need avaldavad omakorda suurel määral mõju üleüldisele majanduse käekäigule.

Alasäästmine põhjustab erinevaid ühiskondliku ja majandusliku heaolu probleeme. Lisaks raskustele säilitada kõrge elatustase ka pensionieas, võib säästude puudumine raskendada ka majanduslanguse tagajärgedega ja ootamatute kuludega toimetulemist (Karlan *et al.* 2014). Näiteks on täna raskekujulise ägeda respiratoorse sündroomi koroonaviirus 2 (SARS-CoV-2) levik pannud inimesed olukorda, kus nende tööstaatus on ebakindel ning seetõttu toetutakse rohkem enda säästudele, mis on aga omakorda nende finantsilise heaolu määrajaks. Seetõttu on oluline mõista, millised tegurid mõjutavad kodumajapidamiste säästude olemasolu ning suurust. Täna eksisteerib kahetsusväärselt vähe empiirilisi uuringuid, mis mõõdaks korraga mitme käitumusliku aspekti mõju säästmisotsustele, millest tulenevalt on käesolevas töös antud lähenemist kasutatud.

Käesoleva magistritöö eesmärgiks on analüüsida, kuidas erinevad indiviidide eelistused, uskumused ning iseloomujooned mõjutavad leibkonna säästmisharjumusi ning nende säästude suurust tuginedes National Financial Well-Being Survey (NFWBS) ristandmetega läbi viidud regressioonanalüüsile. Magistritöös vastatakse järgnevale uurimisküsimusele: Kas optimism, materiaalsed väärtused, enesekontroll ning vanematepoolne finantskirja õpetamine lapsepõlves mõjutavad Ameerika Ühendriikide leibkonna säästmisharjumusi ning säästude suurust?

Magistritöö eesmärgi saavutamiseks on testitakse nelja hüpoteesi: inimesed, (1) kellel on optimistlik hoiak, (2) kes ei rõhu materialistlikele väärtustele, (3) kellel on enesekontroll ja (4) kelle vanemad õpetasid neile lapsepõlves teadmisi finantsilisest heaolust, säästavad tõenäoliselt rohkem.

Magistritöö eesmärgi saavutamiseks ning püstitatud hüpoteeside testimiseks viidi põhiosas läbi regressioonanalüüs hariliku vähimruutude meetodiga, koos kohandatud standardvigadega, kasutades pideva sõltuva muutujana säästude ja sissetuleku suhet. Tulemusi kontrolliti viies läbi regressioonanalüüs järjestatud logiti mudeliga, koos kohandatud standardvigadega, kasutades kategoorilise sõltuva muutujana säästude suurust.

Regressioonmudelite tulemustest selgus, et nii mõningad sotsiaalmajanduslikud kui ka kuus käitumuslikku muutujat üheksast on statistiliselt olulised säästude suuruse selgitajad. Tulemused näitavad, et optimistlikud inimesed säästavad vähem. Eelneva kirjanduse põhjal eksisteerib mõõduka optimismi ning säästmisharjumuste vahel siiski positiivne seos, kuid kui inimene on väga optimistliku ellusuhtumisega, võib ta kalduda liigsele enesekindlusele ning sellest tulenevalt teha ka riskantsemaid finantsotsuseid. Materialismi mõõtsid kaks erinevat sõltumatut muutujat, millest üks viitas positiivsele ning teine negatiivsele suhtele materialistlike väärtuste ning säästude suuruse vahel. Hariliku vähimruutude regressioonanalüüsis viitasid kaks viiest enesekontrolli mõõtvatest sõltumatutest muutujatest positiivsele seosele enesekontrolli ning suurema koguse säästude vahel. Järjestatud logiti regressioonanalüüsist selgus lisaks ka kolmanda statistiliselt olulise enesekontrolli mõõtva sõltumatu muutuja mõju säästudele, mis oli sootuks negatiivne. Viimasena selgus, et need inimesed säästavad täna rohkem, kelle vanemad lapsepõlves õpetasid neile läbi erinevate viiside finantskirjaoskust ning -heaolu.

Kokkuvõttes selgus National Financial Well-Being Survey andmetele põhinevate regressioonanalüüside tulemustest, et kõik neli nullhüpoteesi, mis mõõtsid käitumuslikke aspektide ning leibkonna säästmise ning säästmiskoguste vahelist suhet, lükati ümber. Antud magistritöö käigus leiti, et indiviidid, kes on optimistlikumad säästavad vähem ning inimesed, kes omavad materialistlike väärtuseid võivad säästa vähem või rohkem. Indiviidid, kellel on enesekontroll või kelle vanemad õpetasid neile lapsepõlves teadmisi finantsilisest heaolust, säästavad rohkem.

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APPENDICES

Appendix 1. Descriptive statistics of variables

Variable	Mean	Median	Min	Max	Std. Dev.	N
savings_to_income	0.28	0.10	0.00	1.90	0.37	4,469
savings_levels	4.54	5.00	1.00	7.00	1.76	4,544
age	4.50	4.00	1.00	8.00	2.04	4,469
gender	0.46	0.00	0.00	1.00	0.50	4,469
education	3.27	3.00	1.00	5.00	1.17	4,469
Less_than_high_school	0.05	0.00	0.00	1.00	0.22	4,469
High_school	0.23	0.00	0.00	1.00	0.42	4,469
Some_college	0.30	0.00	0.00	1.00	0.46	4,469
Bachelors	0.22	0.00	0.00	1.00	0.42	4,469
Graduate	0.19	0.00	0.00	1.00	0.40	4,469
income	5.73	6.00	1.00	9.00	2.61	4,469
proxy_income	3.33	3.00	1.00	5.00	1.10	4,465
homeowner	0.68	1.00	0.00	1.00	0.46	4,458
race	1.54	1.00	1.00	4.00	1.02	4,469
White	0.74	1.00	0.00	1.00	0.44	4,469
Black	0.09	0.00	0.00	1.00	0.29	4,469
Other	0.05	0.00	0.00	1.00	0.21	4,469
Hispanic	0.12	0.00	0.00	1.00	0.32	4,469
household_size	2.50	2.00	1.00	5.00	1.20	4,469
kids	0.39	0.00	0.00	1.00	0.49	4,095
health	3.45	4.00	1.00	5.00	0.92	4,453
employment	4.19	2.00	1.00	8.00	2.73	4,419
Self_employed	0.06	0.00	0.00	1.00	0.25	4,419
Work_full_time	0.44	0.00	0.00	1.00	0.50	4,419
Work_part_time	0.06	0.00	0.00	1.00	0.24	4,419
Homemaker	0.05	0.00	0.00	1.00	0.22	4,419
Fulltime_student	0.02	0.00	0.00	1.00	0.14	4,419
Unable_to_work	0.04	0.00	0.00	1.00	0.20	4,419
Unemployed	0.03	0.00	0.00	1.00	0.17	4,419
Retired	0.29	0.00	0.00	1.00	0.45	4,419
support	0.48	0.50	0.00	1.00	0.34	4,450
shock_absorbtion	0.80	1.00	0.00	1.00	0.40	4,319
shock_events	0.82	1.00	0.00	11.00	1.02	4,469
region	2.63	3.00	1.00	4.00	1.03	4,469
Northeast	0.18	0.00	0.00	1.00	0.39	4,469
Midwest	0.23	0.00	0.00	1.00	0.42	4,469
South	0.35	0.00	0.00	1.00	0.48	4,469
West	0.23	0.00	0.00	1.00	0.42	4,469
poor_county	0.22	0.00	0.00	1.00	0.42	4,218

Appendix 1 continuation

Variable	Mean	Median	Min	Max	Std. Dev.	N
optimism	5.39	5.50	1.00	7.00	1.29	4,463
materialism	2.66	2.67	0.33	5.00	0.85	4,396
frugality	5.26	5.00	1.00	6.00	0.84	4,468
selfcontrol	2.98	3.00	1.00	4.00	0.57	4,466
fin_selfcontrol	3.72	3.80	1.00	5.00	0.68	4,469
time_horizon	3.15	3.00	1.00	5.00	1.30	4,441
waiting_tendency	0.62	1.00	0.00	1.00	0.48	4,444
future_self	72.88	85.00	0.00	100.00	30.01	4,336
finvalues_parents	1.77	2.00	0.00	4.00	1.38	4,469

Source: Author's calculations based on NFWBS data

Appendix 2. Correlation matrix with first part of socio-economic variables

	savings_to_income	savings_levels	age	gender	education	income	proxy_income	homeowner	race
savings_to_income	1.00								
savings_levels	0.61	1.00							
age	0.31	0.32	1.00						
gender	-0.03	-0.12	0.028	1.00					
education	0.04	0.36	-0.04	-0.16	1.00				
income	-0.07	0.52	0.00	-0.13	0.52	1.00			
proxy_income	0.30	0.61	0.17	-0.09	0.26	0.40	1.00		
homeowner	0.18	0.41	0.37	-0.03	0.17	0.36	0.27	1.00	
race	-0.09	-0.19	-0.17	-0.00	-0.14	-0.20	-0.11	-0.23	1.00
household_size	-0.18	-0.14	-0.36	0.02	-0.02	0.12	-0.10	-0.03	0.14
kids	-0.17	-0.13	-0.28	0.01	0.01	0.10	-0.09	0.05	0.08
health	0.08	0.27	-0.10	-0.04	0.26	0.29	0.27	0.12	-0.07
employment	0.25	0.12	0.64	0.08	-0.13	-0.18	0.05	0.14	-0.11
support	0.04	0.02	-0.13	0.03	0.08	0.06	0.06	-0.06	-0.01
shock_absorbtion	0.28	0.63	0.22	-0.10	0.28	0.42	0.49	0.38	-0.16
shock_events	-0.09	-0.15	-0.11	0.03	0.01	-0.06	-0.16	-0.05	0.05
region	0.02	0.01	-0.01	-0.04	0.02	-0.02	0.02	-0.01	0.17
poor_county	-0.03	-0.14	-0.01	0.01	-0.12	-0.18	-0.08	-0.08	0.17
optimism	0.09	0.27	0.06	-0.01	0.13	0.20	0.36	0.16	0.04
materialism	-0.05	-0.07	-0.14	-0.06	-0.01	0.00	-0.07	-0.11	0.06
frugality	0.08	0.11	0.07	0.02	0.04	0.01	0.08	0.10	-0.04
selfcontrol	0.13	0.27	0.03	-0.04	0.15	0.16	0.30	0.13	-0.02
fin_selfcontrol	0.12	0.28	0.06	-0.03	0.11	0.14	0.30	0.14	0.01
time_horizon	0.19	0.38	0.08	-0.09	0.23	0.30	0.34	0.21	-0.16
waiting_tendency	0.16	0.35	0.07	-0.06	0.20	0.23	0.26	0.16	-0.15
future_self	0.17	0.32	0.29	-0.04	0.13	0.20	0.22	0.28	-0.18
finvalues_parents	0.04	0.21	-0.14	-0.07	0.24	0.20	0.19	0.03	-0.04

Source: Author’s calculations based on NFWBS data

Appendix 3. Correlation matrix with second part of socio-economic variables

	household_size	kids	health	employment	support	shock_absorbtion	shock_events	region	poor_county
household_size	1.00								
kids	0.56	1.00							
health	0.04	0.05	1.00						
employment	-0.27	-0.30	-0.16	1.00					
support	0.04	0.02	0.08	-0.12	1.00				
shock_absorbtion	-0.08	0.07	0.26	0.04	0.04	1.00			
shock_events	0.16	0.16	-0.11	-0.07	0.00	-0.16	1.00		
region	0.05	0.02	-0.01	0.02	0.00	-0.00	0.04	1.00	
poor_county	0.02	-0.00	-0.08	0.03	-0.00	-0.11	0.02	0.23	1.00
optimism	0.04	0.04	0.37	-0.01	0.07	0.28	-0.10	0.06	-0.01
materialism	0.05	0.00	-0.01	-0.07	0.05	-0.06	-0.00	-0.01	0.02
frugality	0.00	0.01	0.08	0.02	0.03	0.08	0.02	0.02	-0.01
selfcontrol	0.02	0.01	0.29	-0.04	0.04	0.22	-0.06	0.02	-0.02
fin_selfcontrol	-0.02	-0.02	0.23	0.03	0.04	0.25	-0.04	0.05	-0.01
time_horizon	-0.05	-0.04	0.14	0.02	0.03	0.28	-0.11	-0.01	-0.09
waiting_tendency	-0.06	-0.06	0.12	0.01	0.03	0.26	-0.06	-0.01	0.07
future_self	-0.12	0.08	0.09	0.15	0.01	0.24	-0.10	-0.02	-0.06
finvalues_parents	0.03	-0.01	0.22	-0.12	0.17	0.17	0.02	-0.03	-0.07

Source: Author’s calculations based on NFWBS data

Appendix 4. Correlation matrix with behavioural variables

	optimism	materialism	frugality	selfcontrol	fin_selfcontrol	time_horizon	waiting_tendency	future_self	finvalues_parents
optimism	1.00								
materialism	-0.02	1.00							
frugality	0.10	-0.20	1.00						
selfcontrol	0.30	-0.06	0.23	1.00					
fin_selfcontrol	0.32	-0.02	0.27	0.46	1.00				
time_horizon	0.17	-0.03	0.04	0.13	0.12	1.00			
waiting_tendency	0.10	-0.09	0.08	0.13	0.12	0.24	1.00		
future_self	0.12	-0.13	0.12	0.11	0.10	0.17	0.14	1.00	
finvalues_parents	0.16	0.10	0.07	0.18	0.20	0.12	0.12	0.03	1.00

Source: Author's calculations based on NFWBS data

Appendix 5. Relationship between savings to income ratio and individual values

		Base model	Model 2	Model 3	Model 4	Model 5	Model 6	Final model
Base	const	-0.262 (0.039) ***	-0.227 (0.041) ***	-0.392 (0.052) ***	-0.360 (0.048) ***	-0.267 (0.039) ***	-0.398 (0.054) ***	-0.440 (0.057) ***
	age	0.025 (0.004) ***	0.026 (0.004) ***	0.026 (0.004) ***	0.026 (0.004) ***	0.027 (0.004) ***	0.027 (0.004) ***	0.027 (0.004) ***
	gender	-0.002 (0.011)	-0.001 (0.011)	0.000 (0.011)	-0.000 (0.011)	-0.001 (0.010)	0.005 0.011	0.004 (0.011)
	proxy_income	0.088 (0.005) ***	0.092 (0.005) ***	0.088 (0.005) ***	0.078 (0.006) ***	0.087 (0.005) ***	0.084 (0.013) ***	0.083 (0.006) ***
	homeowner	0.004 (0.013)	0.005 (0.013)	0.002 (0.013)	-0.008 (0.013)	0.004 (0.013)	-0.004 (0.013)	-0.007 (0.013)
	household_size	-0.023 (0.005) ***	-0.022 (0.005) ***	-0.023 (0.005) ***	-0.022 (0.005) ***	-0.023 (0.005) ***	-0.021 (0.005) ***	-0.021 (0.005) ***
	kids	-0.022 (0.013) *	-0.021 (0.013) *	-0.020 (0.013)	-0.019 (0.013)	-0.020 (0.013)	-0.017 (0.013)	-0.016 (0.013)
	health	0.011 (0.006) *	0.018 (0.007) ***	0.010 (0.006)	0.008 (0.007)	0.010 (0.006)	0.017 (0.007) **	0.014 (0.007) **
	support	0.002 (0.016)	0.004 (0.016)	-0.000 (0.016)	0.000 (0.016)	-0.002 (0.016)	-0.004 (0.016)	-0.004 (0.016)
	shock_absorbtion	0.131 (0.014) ***	0.134 (0.014) ***	0.129 (0.014) ***	0.112 (0.014) ***	0.128 (0.013) ***	0.117 (0.014) ***	0.113 (0.014) ***
	shock_events	0.001 (0.005)	0.000 (0.005)	0.001 (0.005)	0.004 (0.005)	0.001 (0.005)	0.002 (0.005)	0.002 (0.005)
	poor_county	-0.023 (0.013) *	-0.022 (0.013) *	-0.024 (0.013) *	-0.021 (0.013) *	-0.022 (0.013) *	-0.020 (0.013)	-0.020 (0.013)
	High_school	0.086 (0.024) ***	0.083 (0.024) ***	0.086 (0.024) ***	0.086 (0.024) ***	0.086 (0.024) ***	0.079 (0.024) ***	0.083 (0.024) ***
	Some_college	0.016 (0.023)	0.014 (0.023)	0.014 (0.023)	0.011 (0.024) ***	0.013 (0.023)	0.005 (0.023)	0.007 (0.023)
	Bachelors	0.030 (0.025)	0.027 (0.025)	0.031 (0.025)	0.024 (0.025)	0.025 (0.025)	0.014 (0.025)	0.016 (0.025)

Appendix 5 continuation

		Base model	Model 2	Model 3	Model 4	Model 5	Model 6	Final model
Base	Graduate	0.012	0.010	0.014	-0.000	0.006	-0.007	-0.006
		(0.026)	(0.026)	(0.026)	(0.027)	(0.026)	(0.026)	(0.026)
	Black	-0.059	-0.055	-0.060	-0.043	-0.058	-0.041	-0.039
		(0.020) ***	(0.020) ***	(0.020) ***	(0.021) **	(0.020) ***	(0.021) **	(0.021) *
	Other	0.065	0.062	0.067	0.069	0.065	0.065	0.066
		(0.025) **	(0.025) **	(0.025) ***	(0.025) ***	(0.025) ***	(0.025) **	(0.025) ***
	Hispanic	-0.007	-0.001	-0.007	0.001	-0.007	0.011	0.009
		(0.018)	(0.019)	(0.019)	(0.019)	(0.018)	(0.019)	(0.019)
	Self_employed	0.037	0.038	0.036	0.040	0.036	0.037	0.040
		(0.019) *	(0.019) *	(0.020) *	(0.020) **	(0.019) *	(0.019) *	(0.019) **
	Work_parttime	0.044	0.042	0.044	0.047	0.043	0.040	0.042
		(0.023) *	(0.023) *	(0.023) *	(0.024) **	(0.023) *	(0.023) *	(0.024) *
	Homemaker	0.083	0.082	0.077	0.078	0.083	0.076	0.074
		(0.022) ***	(0.022) ***	(0.022) ***	(0.022) ***	(0.022) ***	(0.022) ***	(0.022) ***
	Fulltime_student	0.082	0.083	0.087	0.078	0.079	0.079	0.079
		(0.038) **	(0.038) **	(0.039) **	(0.039) **	(0.038) **	(0.039) **	(0.039) **
	Unable_to_work	0.023	0.020	0.018	0.021	0.022	0.018	0.014
		(0.025)	(0.025)	(0.025)	(0.026)	(0.025)	(0.026)	(0.027)
	Unemployed	0.120	0.114	0.123	0.127	0.119	0.113	0.117
		(0.039) ***	(0.039) ***	(0.040) ***	(0.041) ***	(0.039) ***	(0.040) ***	(0.041) ***
	Retired	0.120	0.122	0.121	0.122	0.118	0.124	0.123
		(0.019) ***	(0.019) ***	(0.019) ***	(0.020) ***	(0.019) ***	(0.019) ***	(0.020) ***
	Northeast	-0.025	-0.027	-0.031	-0.031	-0.026	-0.037	-0.036
		(0.015) *	(0.015) *	(0.015) **	(0.015) **	(0.015) *	(0.015) **	(0.015) **
	Midwest	-0.024	-0.025	-0.025	-0.023	-0.024	-0.025	-0.024
		(0.015) *	(0.015) *	(0.015) *	(0.015)	(0.015) *	(0.015) *	(0.015)
	West	-0.016	-0.016	-0.018	-0.018	-0.015	-0.016	-0.018
		(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)

Appendix 5 continuation

		Base model	Model 2	Model 3	Model 4	Model 5	Model 6	Final model
H1	optimism		-0.014				-0.018	-0.019
			(0.005) ***				(0.005) ***	0.005 ***
H2	materialism			0.014			0.014	0.016
				(0.006) **			(0.006) **	0.006 **
	frugality			0.019			0.018	0.015
				(0.006) ***			(0.006) ***	0.006 **
H3	selfcontrol				0.013			0.015
					(0.011)			0.011
	fin_selfcontrol				0.007			0.006
					(0.009)			0.009
	time_horizon				0.019		0.020	0.019
					(0.005) ***		(0.004) ***	0.005 ***
	waiting_tendency				0.045		0.046	0.045
					(0.011) ***		(0.011) ***	0.012 ***
	future_self				0.000			0.000
					(0.000)			0.000
H4	finvalues_parents					0.009	0.008	0.008
						(0.004) **	(0.004) **	0.004 *
N		3,684	3,680	3,636	3,575	3,684	3,611	3,569
Adj. R2		27.44%	27.59%	27.64%	28.17%	27.53%	28.61%	28.68%

Source: Author's calculations based on NFWBS data

Notes: *p<0.1; **p<0.05; ***p<0.01. The model is OLS regression model with robust standard errors and with a continuous dependent variable *savings_to_income.*

Appendix 6. OLS regression base model

BASE MODEL:
OLS, using observations 1-4469 (n = 3684)
Missing or incomplete observations dropped: 785
Dependent variable savings_to_income
Heteroskedasticity-robust standard errors, variant HC1

	coefficient	std.error	t-ratio	p-value	
const	-0.262446	0.03987968	-6.765	1.55e-11	***
age	0.0254606	0.00429229	5.932	3.28e-09	***
gender	-0.00247437	0.0108905	-0.2272	0.8203	
proxy_income	0.0878294	0.00541822	16.21	04.03.1957	***
homeowner	0.00440856	0.0129974	0.3392	0.7345	
household_size	-0.0228121	0.00516450	-4.417	1.03e-05	***
kids	-0.0222546	0.0127647	-1.743	0.0813	*
health	0.0114647	0.00643519	1.782	0.0749	*
support	0.00253232	0.0159341	0.1589	0.8737	
shock_absorbtion	0.131245	0.0136620	9.607	1.35e-21	***
shock_events	0.00117107	0.00494076	0.237	0.8127	
poor_county	-0.0229531	0.0127172	-1.805	0.0712	*
High_school	0.0864307	0.0239194	3.613	0.0003	***
Some_college	0.0157610	0.0232682	0.6774	0.4982	
Bachelors	0.0303253	0.0251945	1.204	0.2288	
Graduate	0.0120324	0.0263810	0.4561	0.6483	
Black	-0.0588727	0.0202774	-2.903	0.0037	***
Other	0.0646079	0.0252060	2.563	0.0104	**
Hispanic	-0.00715772	0.0184229	-0.3885	0.6977	
Self_employed	0.0367561	0.0194764	1.887	0.0592	*
Work_part_time	0.0444515	0.0234156	1.898	0.0577	*
Homemaker	0.0828535	0.0217534	3.809	0.0001	***
Fulltime_student	0.0824660	0.0381883	2.159	0.0309	**
Unable_to_work	0.0228926	0.0248643	0.9207	0.3573	
Unemployed	0.120450	0.0388930	3.097	0.0020	***
Retired	0.119595	0.0193440	6.183	7.00e-10	***
Northeast	-0.0246946	0.0149178	-1.655	0.0979	*
Midwest	-0.0244698	0.0146043	-1.676	0.0939	*
West	-0.0159713	0.0132539	-1.205	0.2283	

Mean dependent var	0.291075	S.D. dependent var	0.363437
Sum squared resid	350.2972	S.E. of regression	0.309581
R-squared	0.279927	Adjusted R-squared	0.274410
F(25, 3863)	68.76437	P-value(F)	0.000000
Log-likelihood	-893.1941	Akaike criterion	1844.388
Schwarz criterion	2024.529	Hannan-Quinn	1908.511

Excluding the constant, p-value was highest for variable 14 (support)
Source: Author's calculations based on NFWBS data

Appendix 7. OLS regression final model

FINAL MODEL
OLS, using observations 1-4469 (n = 3569)
Missing or incomplete observations dropped: 900
Dependent variable savings_to_income
Heteroskedasticity-robust standard errors, variant HC1

	coefficient	std.error	t-ratio	p-value	
const	-0.440105	0.0568159	-7.746	1.23e-14	***
age	0.0274300	0.00438175	6.260	4.31e-10	***
gender	0.00413670	0.0109841	0.3766	0.7065	
proxy_income	0.0826011	0.00596695	13.84	1.77e-42	***
homeowner	-0.00696602	0.0133755	-0.5208	0.6025	
household_size	-0.0213317	0.00526930	-4.048	5.27e-05	***
kids	-0.0164958	0.0130334	-1.266	0.2057	
health	0.0136961	0.00685399	1.998	0.0458	**
support	-0.00407748	0.0162843	-0.2504	0.8023	
shock_absorbtion	0.112583	0.0143158	7.864	4.90e-15	***
shock_events	0.00246697	0.00498102	0.4953	0.6204	
poor_county	-0.0196010	0.0128155	-1.529	0.1262	
High_school	0.0832717	0.0241737	3.445	0.0006	***
Some_college	0.00672008	0.0234097	0.2871	0.7741	
Bachelors	0.0164451	0.0253079	0.6498	0.5159	
Graduate	-0.00608967	0.0264805	-0.2300	0.8181	
Black	-0.0391147	0.0209970	-1.863	0.0626	*
Other	0.0656289	0.0253598	2.588	0.0097	***
Hispanic	0.00879997	0.0191919	0.4585	0.6466	
Self_employed	0.0402725	0.0195138	2.064	0.0391	**
Work_parttime	0.0418570	0.0239974	1.744	0.0812	*
Homemaker	0.0737345	0.0220275	3.347	0.0008	***
Fulltime_student	0.0786311	0.0387945	2.027	0.0428	**
Unable_to_work	0.0137050	0.0265792	0.5156	0.6061	
Unemployed	0.117322	0.0406932	2.883	0.0040	***
Retired	0.123134	0.0195509	6.298	3.38e-10	***
Northeast	-0.0360811	0.0149563	-2.412	0.0159	**
Midwest	-0.0242783	0.0148193	-1.638	0.1015	
West	-0.0176585	0.0134870	-1.309	0.1905	
optimism	-0.0189449	0.00519784	-3.645	0.0003	***
materialism	0.0162044	0.00633253	2.559	0.0105	**
frugality	0.0149019	0.00601936	2.476	0.0133	**
selfcontrol	0.0146245	0.0110410	1.325	0.1854	
fin_selfcontrol	0.00589168	0.00898271	0.6559	0.5119	
time_horizon	0.0192954	0.00456561	4.226	2.44e-05	***
waiting_tendency	0.0446996	0.0115825	3.859	0.0001	***
future_self	0.000201426	0.000183454	1.098	0.2723	
finvalues_parents	0.00765473	0.00419158	1.826	0.0679	*

Appendix 7 continuation

Mean dependent var	0.292154	S.D. dependent var	0.363043
Sum squared resid	331.9246	S.E. of regression	0.306599
R-squared	0.294171	Adjusted R-squared	0.286775
F(25, 3863)	52.77323	P-value(F)	2.2e-304
Log-likelihood	-825.7669	Akaike criterion	1727.534
Schwarz criterion	1962.375	Hannan-Quinn	1811.263

Excluding the constant, p-value was highest for variable 32 (Graduate)
Source: Author's calculations based on NFWBS data.

Appendix 8. Ordered logit final model

Function evaluations: 228
Evaluations of gradient: 56

FINAL MODEL LOGIT
Ordered Logit, using observations 1-4469 (n = 3569)
Missing or incomplete observations dropped: 900
Dependent variable savings_levels
QML standard errors

	coefficient	std.error	z	p-value	
age	0.228901	0.0252960	9.049	1.44e-19	***
gender	−0.0962830	0.0655874	−1.468	0.1421	
proxy_income	0.813762	0.0394540	20.63	1.62e-94	***
homeowner	0.355473	0.0804326	4.420	9.89e-06	***
household_size	−0.0436342	0.0339258	−1.286	0.1984	
kids	−0.140248	0.0828900	−1.692	0.0907	*
health	0.0482059	0.0440727	1.094	0.2741	
support	−0.0953021	0.0942388	−1.011	0.3119	
shock_absorbtion	1.81922	0.116061	15.67	2.25e-55	***
shock_events	0.0185653	0.0332411	0.5585	0.5765	
poor_county	−0.202806	0.0796258	−2.547	0.0109	**
High_school	0.646330	0.172926	3.738	0.0002	***
Some_college	0.765593	0.169120	4.527	5.98e-06	***
Bachelors	1.26514	0.176750	7.158	8.20e-13	***
Graduate	1.34493	0.181723	7.401	1.35e-13	***
Black	−0.599899	0.133782	−4.484	7.32e-06	***
Other	0.410137	0.156533	2.620	0.0088	***
Hispanic	−0.0492421	0.117209	−0.4201	0.6744	
Self_employed	0.132974	0.134132	0.9914	0.3215	
Work_parttime	−0.0114701	0.133781	−0.08574	0.9317	
Homemaker	0.426728	0.144965	2.944	0.0032	***
Fulltime_student	0.300749	0.210795	1.427	0.1537	
Unable_to_work	−0.588101	0.199665	−2.945	0.0032	***
Unemployed	0.0331139	0.232816	0.1422	0.8869	
Retired	0.137753	0.114302	1.205	0.2281	
Northeast	0.0421715	0.0905066	0.4659	0.6413	
Midwest	−0.156617	0.0837780	−1.869	0.0616	*
West	0.0771767	0.0851887	0.9059	0.3650	
optimism	−0.0926904	0.0310441	−2.986	0.0028	***
materialism	0.106292	0.0397149	2.676	0.0074	***
frugality	0.0788773	0.0430970	1.830	0.0672	*
selfcontrol	0.0553186	0.0709111	0.7801	0.4353	
fin_selfcontrol	0.0834373	0.0607450	1.374	0.1696	
time_horizon	0.207740	0.0280140	7.416	1.21e-13	***
waiting_tendency	0.553177	0.0700414	7.898	2.84e-15	***
future_self	0.00348906	0.00123353	2.829	0.0047	***
finvalues_parents	0.117428	0.0253704	4.629	3.68e-06	***

Appendix 8 continuation

cut1	3.66868	0.408554	8.980	2.72e-19	***
cut2	4.94242	0.407363	12.13	7.09e-34	***
cut3	6.55842	0.412278	15.91	5.60e-57	***
cut4	8.21070	0.421035	19.50	1.07e-84	***
cut5	9.80481	0.428950	22.86	1.22e-115	***
cut6	11.1397	0.434081	25.66	3.04e-145	***

Mean dependent var	4.672457	S.D. dependent var	1.704165
Log-likelihood	-5067.337	Akaike criterion	10220.67
Schwarz criterion	10486.42	Hannan-Quinn	10315.42

Number of cases 'correctly predicted' = 1340 (37.5%)
Likelihood ratio test: Chi-square(37) = 3937.07 [0.0000]
Source: Author’s calculations based on NFWBS data.

Appendix 9. Ordered logit final model odds ratios

Odds-ratios for savings_levels

Variable	Odds-ratio	95.0% conf. interval	
age	1.2572	[1.196,	1.321]
gender	0.9082	[0.799,	1.033]
proxy_income	2.2564	[2.088,	2.438]
homeowner	1.4269	[1.219,	1.670]
household_size	0.9573	[0.896,	1.023]
kids	0.8691	[0.739,	1.022]
health	1.0494	[0.963,	1.144]
support	0.9091	[0.756,	1.094]
shock_absorbtion	6.1671	[4.912,	7.742]
shock_events	1.0187	[0.954,	1.087]
poor_county	0.8164	[0.698,	0.954]
High_school	1.9085	[1.360,	2.679]
Some_college	2.1503	[1.544,	2.995]
Bachelors	3.5436	[2.506,	5.011]
Graduate	3.8379	[2.688,	5.480]
Black	0.5489	[0.422,	0.713]
Other	1.5070	[1.109,	2.048]
Hispanic	0.9520	[0.757,	1.198]
Self_employed	1.1422	[0.878,	1.486]
Work_parttime	0.9886	[0.761,	1.285]
Homemaker	1.5322	[1.153,	2.036]
Fulltime_student	1.3509	[0.894,	2.042]
Unable_to_work	0.5554	[0.376,	0.821]
Unemployed	1.0337	[0.655,	1.631]
Retired	1.1477	[0.917,	1.436]
Northeast	1.0431	[0.874,	1.246]
Midwest	0.8550	[0.726,	1.008]
West	1.0802	[0.914,	1.277]
optimism	0.9115	[0.858,	0.969]
materialism	1.1121	[1.029,	1.202]
frugality	1.0821	[0.994,	1.177]
selfcontrol	1.0569	[0.920,	1.214]
fin_selfcontrol	1.0870	[0.965,	1.224]
time_horizon	1.2309	[1.165,	1.300]
waiting_tendency	1.7388	[1.516,	1.995]
future_self	1.0035	[1.001,	1.006]
finvalues_parents	1.1246	[1.070,	1.182]

Source: Author’s calculations based on NFWBS data.

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