Journal of Behavioral and Experimental Economics 93 (2021) 101702

Contents lists available at ScienceDirect

Journal of Behavioral and Experimental Economics

journal homepage: www.elsevier.com/locate/jbee

Does self-control constitute a driver of millennials' financial behaviors and attitudes?

Lucía Rey-Ares [a,*], Sara Fernández-López [b], Sandra Castro-González [c], David Rodeiro-Pazos [b]

[a] Business Department, Universidade da Coruña. Faculty of Humanities and Documentation, Campus de Esteiro, s/n, 15403 Ferrol, Galicia, Spain
[b] Department of Financial Economics and Accounting, Universidade de Santiago de Compostela. Faculty of Economics and Business. 15782 Santiago de Compostela, Galicia, Spain
[c] Department of Business Organization and Commercialization, Universidade de Santiago de Compostela. Faculty of Business Administration, Avda. Alfonso X El Sabio, s/n, 27002 Lugo, Galicia, Spain

ARTICLE INFO

Keywords:
Self-control
Financial behavior
Financial attitudes
Financial literacy
Spain
Millennial generation

ABSTRACT

Millennials are currently facing particular financial challenges that will condition the future financial well-being of the society as a whole, and the decision-making process happening in worse circumstances than those of preceding generations. However, few studies to date have deeply analyzed millennials' financial behaviors, and particularly, how self-control operationalizes their financial choices. Using data from the 2017 Survey of Financial Competences of Spanish individuals, this paper analyzes how self-control influences different financial behaviors and attitudes and whether this effect differs between millennials and older generations. The results indicate that self-control does influence the individuals' financial attitudes regardless of generation, whereas in the case of financial behaviors, only those millennials exhibiting the highest levels of self-control are affected by it when deciding on a saving account or a personal loan. These outcomes have numerous significant implications, in addition to providing recommendations to policy makers aimed at engaging millennials in healthier financial behaviors.

1. Introduction

The millennial generation represents around one quarter of the world's population (Gutiérrez-Rubí, 2016), and it will comprise around 75 percent of the global workforce by the year 2025 (Lobera and Rubio, 2015). Defined as those people reaching young adulthood around the year 2000, millennials are probably the most observed and analyzed generational cohort in history (Seppanen and Gualtieri, 2012). Nevertheless, the studies focused on millennials' financial behaviors and/or attitudes are mostly descriptive, and some fundamental questions remain open due to the lack of consistent statistics. Millennials, currently between their early twenties and late thirties, entered the workforce and began the financial life cycle from the year 2000 onwards; indeed, the youngest millennials are now entering the labor market. Therefore, until recently, many millennials have been left out of official income/wealth surveys conducted by the national Central Banks.

The rising relevance of this generation necessitates an assessment of its financial behaviors (Kim *et al.*, 2019). At the individual level, the financial behavior of millennials now, especially of those in their thirties, will heavily impact their lifetime financial wellbeing (Kim *et al.*, 2019). At the institutional level, the millennial generation constitutes the latest wave of banking customers, representing a natural opportunity for the banking industry (Nava *et al.*, 2014). At the macro-level, the complex economic landscape leads millennials to make financial decisions in an era of risk and uncertainty (Cramer, 2014) that has complicated their decision-making (Friedline and West, 2016). In fact, millennials face more difficult retirement prospects than previous generations at the same life stage (Kelly and Datta, 2015): entering the labor market in the post-great recession economy, they are experiencing limited job opportunities (Rubin, 2014) and lower wages (Cutler, 2015; McLendon, 2016; Kim *et al.*, 2019) than older generations. Moreover, the complexity of financial instruments has not stopped growing over the last two decades, forcing millennials to cope with increasingly complex financial markets (Kim *et al.*, 2019). All these circumstances have influenced their financial behavior and attitudes, so that it might be different from the one of other generational cohorts (Inseng and

* Corresponding author.
E-mail addresses: lucia.rey.ares@udc.es (L. Rey-Ares), sara.fernandez.lopez@usc.es (S. Fernández-López), sandra.castro@usc.es (S. Castro-González), david.rodeiro@usc.es (D. Rodeiro-Pazos).

https://doi.org/10.1016/j.socec.2021.101702
Received 17 August 2020; Received in revised form 5 April 2021; Accepted 8 April 2021
Available online 20 April 2021

Teichert, 2016; Lövgren and Magnusson, 2016). Not surprisingly, millennials tend to exhibit more troubling financial behaviors than preceding generations at the same life stage (Mottola, 2014; Birkenmaier and Fu, 2016; Kim *et al.*, 2019).

In this regard, the individual's level of self-control, defined as the restraint exercised over one's own impulses, desires, or emotions, has emerged as one of the psychological and attitudinal traits that may impact financial behaviors (Gathergood, 2012). Indeed, empirical evidence has consistently shown that a lack of self-control leads to negative financial behaviors, such as excessive and overly expensive borrowing, or under-saving for retirement. But research connecting financial behavior to self-control is still underdeveloped (Strömbäck *et al.*, 2017). To date, only a handful of studies have addressed this issue, focusing on specific financial decisions without analyzing whether the effect of self-control varies among different financial behaviors that involve different time horizons. Additionally, the literature has overlooked the effect of self-control problems on millennials' financial behaviors and attitudes. Overall, young adults tend to exhibit low levels of self-control regardless of their generation, but the circumstances in which millennials have been raised might have resulted in a higher lack of self-control than that of previous generations at similar ages. Their upbringing occurred during an era of relative prosperity on the global scale (Cramer, 2014), with an abundance of nearby shops and online consumption rising, which might have resulted in greater consumerist behavior than in preceding generations. In contrast, they have come of age in an economic landscape dramatically altered by the great recession (Cramer, 2014). Therefore, bad behaviors resulting from self-control problems might be more dangerous for millennials than for previous generations because they are likely to be dealing with its consequences for their financial lifetime.

The goals of this study are twofold. Firstly, it aims to explore the relationship between self-control and financial behaviors by distinguishing among different financial decisions and attitudes; secondly, it seeks to analyze whether the effect of self-control on financial behaviors and attitudes differs between millennials and older generations. Gaining better understanding of the forces that shape millennials' financial behavior is critical for several reasons. From the demand side, as indicated above, this generational cohort is currently facing financial struggles that will condition its major lifetime financial goals (Kim *et al.*, 2019; Lee *et al.*, 2019) and this decision-making process is taking place in worse circumstances than those of previous generations. Compared to their parents, the higher uncertainty in working lives (Nancy, 2016) and the worse economic conditions (Cutler, 2015; McLendon, 2016; Kim *et al.*, 2019) have left them increasingly financially vulnerable (Cramer, 2014).

From the supply side, today's young adults constitute the greatest challenge for financial institutions in the 2030s. Although millennials represent a large and attractive consumer market (Lantos, 2014; Nava *et al.*, 2014), it will be difficult to attract them because, among other reasons, they are not only less financially literate (Financial Industry Regulatory Authority -FINRA-, 2013; Mottola, 2014; Kim *et al.*, 2019)—precisely in a financial environment with a rising complexity of the financial products (Kim *et al.*, 2019)—but they also rely less on financial institutions (Afandi and Habibov, 2013; Lövgren and Magnusson, 2016; Brüggen *et al.*, 2017) and are more reluctant to seek financial advice from professionals (Kim *et al.*, 2019). Gaining insight into the driving forces of millennials' financial behavior is essential not only to help the banking industry to face the challenges imposed by their unique characteristics, but also for sound policy making.

The current study contributes to the literature in four areas. Firstly, it expands the extant literature on self-control by investigating how it influences a wide set of financial behaviors and attitudes. This approach constitutes more than a methodological issue as the effect of self-control may be dependent on the time horizon involved in financial behaviors. Secondly, the study extends the empirical evidence by paying attention to the millennial generation and to a south European country. Thus, a representative sample consisting of around 7,000 Spanish individuals, of which 30 percent are millennials, is analyzed. The sample size allows robust results to be obtained (Farrell *et al.*, 2016). Similarly, the Spanish case leads us to a better understanding of this issue in non-Anglo-Saxon countries, which have been overlooked in the research on the relationship between self-control and financial behavior. Thirdly, the study adds to the literature by controlling for the effect of objective and subjective financial knowledge, an issue often unnoticed by the literature on the association between self-control and financial behavior. Fourthly, based on the empirical evidence obtained, we propose some recommendations aimed at developing healthy financial behaviors.

Following this introductory section, Section 2 summarizes the literature review on self-control. Section 3 presents the data source and the variables. Section 4 comments and discusses the empirical evidence through the univariate and multivariate analyses. Finally, Section 5 addresses the concluding remarks.

2. Literature review

2.1. Self-control and financial behavior

The conceptualization of self-control in the field of economics is generally measured in relation to time preferences (Delaney and Lades, 2017). Usually, a lack of self-control is understood as a deviation from rational behavior, and particularly, a time-inconsistency problem (Delaney and Lades, 2017). Self-control failures can be explained by assuming that people are more patient and thoughtful when making decisions for the distant future than when making decisions for the near future (Lades and Hofmann, 2019). So, self-control is defined as an individual trait that refers to a person's ability to hinder impulsive behavior, which has frequently been considered in financial theory as a decision time-inconsistency problem (Gathergood, 2012). However, in the financial sphere, such short-term decisions often have implications for the future. When a self-control failure occurs, individuals make impulsive decisions such as compulsive shopping (Strömbäck *et al.*, 2017); consequently, individuals' level of self-control may heavily influence their financial behavior and financial well-being.

This association between self-control and financial behavior is firstly grounded within the behavioral lifecycle hypothesis formalized by Shefrin and Thaler (1988). Under this approach, when a person makes a financial decision, he/she faces an ongoing conflict between gaining short-term compensation (short-horizon doer) and obtaining long-term rewards (long-horizon planner). The person's ability to control initial impulses and think about the long run (i.e., self-control) shapes his/her consumption behavior; subsequently, it affects several financial behaviors (e.g., saving, indebtedness, or help-seeking). Therefore, the way in which self-control influences individuals' decision-making (Atkinson and Messy, 2011) affects how those individuals manage their personal finances (Farrell *et al.*, 2016).

Such an association between self-control and financial behavior is also in line with the theory of planned behavior (TPB), introduced by Ajzen (1991). Overall, this theory explains human behaviors that involve planning and future-orientation such as several financial behaviors. The TPB indicates that an individual's behavior can be determined by three main factors: attitudes, subjective norms, and perceptions of behavior control (Ningsih *et al.*, 2018). For this study, perceived behavioral control is particularly relevant. It refers to people's confidence in their ability to make decisions and take effective actions to obtain desired benefits and avoid unwanted results (Ningsih *et al.*, 2018), which is directly linked with the third element that, according to Shefrin and Thaler (1988), integrates the term self-control with internal conflict and temptation. Thus, stemming from TPB, a person's self-control constitutes a potential driver of their volitional behaviors, as is the case for some financial behaviors.

Although the theory has, since the 1980s, acknowledged the role of self-control in shaping a person's financial behavior (Shefrin and

Thaler, 1988), little research has been conducted on the topic to date (Strömbäck *et al.*, 2017). A reason for that is the scarcity of datasets simultaneously containing information on both psychological traits (such as self-control) and financial behaviors, except for some surveys designed for such a purpose. Some studies over the last decade have therefore analyzed the influence of self-control on financial behavior, though most have focused on specific financial decisions, such as saving or indebtedness (Strömbäck *et al.*, 2017).

Overall, studies have consistently shown that self-control problems are associated with bad financial decisions. Thus, a lack of self-control leads individuals to get into more debt (Webley and Nyhus, 2001), and especially more consumer debt (Gathergood and Weber, 2014; Achtziger *et al.*, 2015). Moreover, people with low levels of self-control are more likely to be over-indebted (Gathergood, 2012) and make more costly use of credit cards (Wang *et al.*, 2011; Sotiropoulos and d'Astous, 2013). Low levels of self-control are also associated with low saving rates in general (Kimball and Shumway, 2009; Lown *et al.*, 2015; Strömbäck *et al.*, 2017) and low retirement savings in particular (Kimball and Shumway, 2009). Similarly, people with low self-control are less likely to seek financial advice (Lim *et al.*, 2014). Moreover, Strömbäck *et al.* (2017) found that low levels of self-control are negatively related to financial well-being. In a similar vein, Biljanovska and Palligkinis (2014) concluded that households with self-control problems are more likely to accumulate less wealth and face financially stressful situations.

Whereas the above-mentioned studies have explored the influence of self-control on a specific behavior, Miotto and Parente (2015) and Strömbäck *et al.* (2017) analyzed the aforementioned influence by considering a more general set of financial behaviors. Overall, the authors found that strong self-control is positively associated with good financial behaviors. Nevertheless, both studies used an aggregated index as a dependent variable, which impedes understanding of how self-control affects different financial behaviors. We address this gap by separately analyzing the impact of self-control on a wide set of financial behaviors. It is crucial to use this empirical approach because financial behaviors involve different time horizons (for instance, credit card loan vs. saving for retirement). Given that self-control can be understood as the ability to manage the trade-off between getting instant gratification and obtaining long-term benefits, it may affect financial behaviors differently depending on the time horizon involved.

In sum, drawing on previous literature and addressing the above-mentioned gap in research on the relationship between self-control and financial behavior, it is expected that:

Hypothesis 1. ***(H1)****:* The individual's level of self-control is positively associated with investment behaviors.

Hypothesis 2. ***(H2)****:* The individual's level of self-control is negatively associated with indebtedness behaviors.

Hypothesis 3. ***(H3)****:* The individual's level of self-control is positively associated with positive financial attitudes.

2.2. Millennials and self-control

As mentioned, there has been little research exploring the potential impact of self-control on financial behavior (Strömbäck *et al.*, 2017). Moreover, no study to date has considered how self-control affects millennials' financial behavior. Young adults in general, and millennials in particular, constitute an interesting generational cohort to study the effects of self-control. Findings from the neuroscientific and psychological fields indicate that, regardless of generation, the younger the person, the greater the difficulty in exerting control over impulsive drives, which increases their vulnerability to engage in potentially risky or addictive behaviors (Romer *et al.*, 2010; Oliva *et al.*, 2019). Also, in the economic field, younger people tend to exhibit an immature economic rationality (Rachma, 2019) which harms their ability to delay gratifications. Besides, millennials have often been referred to as the "instant-gratification generation" (Bishop, 2006).

Millennials have grown up in a different environment from members of previous generations, which might result in more self-control problems regarding consumption than their parents had at a similar age. Although generalizing about a generation is always difficult, millennials' upbringing occurred during a time of relative prosperity and stability on the global scale (Cramer, 2014). Subsequently, millennials have been raised in a more consumptive culture than previous generations in Western countries. Bakewell and Mitchel (2003) indicated that millennials' socialization to the consumption process occurred sooner than in previous generations, just like their introduction to financial services (Perry, 2011). They have also grown up shopping online (Moreno-Herrero *et al.*, 2017). Evidence describes this group as highly consumption-oriented (Burnsed and Bickle, 2015), quick spenders (Moreno-Herrero *et al.*, 2017), impatient (Hill, 2008), and expecting instant gratification (Sweeney, 2006). The members of this generation are willing to spend money without first thinking about the benefits of the items they are willing to buy (Rachma, 2019), thus exhibiting a 'buy now, deal with it later' mentality and often struggling with self-control in spending (Perry, 2011). In other words, millennials are more likely than other age groups to make impulse purchases (Aruna and Santhi, 2015; Burnsed and Bickle, 2015), which reflects a low ability to delay gratification (or low levels of self-control in relation to consumption behavior).

Other generational cohorts who have also grown up and lived in an economic context of uncertainty (Lissitsa and Kol, 2016) show very different economic and consumer behavior. Older generations tend to be more cautious about making economic decisions (Gardner and Macky, 2012) and tend to base their purchases on traditional search and decision-making models (Heaney, 2007). This means that they are more thoughtful and less impulsive—i.e., they do not seek immediate gratification, but rather enjoy durable goods. This is in line with their risk avoidance attitude and their low capacity to assume risks (Reisenwitz and Iyer, 2009). They also exhibit more self-control than millennials (Canaan Messarra *et al.*, 2016).

Millennials entered the workforce during and after the great recession (Cramer, 2014; Friedline and West, 2016), facing an unstable job market (Levenson, 2010) characterized by high unemployment rates and low salaries (Cutler, 2015; McLendon, 2016). At the same time, they have recently begun their financial lifecycles in a context of extraordinarily complex financial markets and increasing financial sophistication (Kim *et al.*, 2019). In such a volatile macroeconomic environment, financial management behaviors have become more important than in previous decades (Lusardi *et al.*, 2010; Lee *et al.*, 2019), both for millennials themselves and for the society.

Financial knowledge can help in making more appropriate decisions, especially in such complicated macroeconomic circumstances, since it has consistently been associated with positive financial behaviors (Kim *et al.*, 2019). However, evidence has shown that millennials exhibit significantly lower levels of financial knowledge than preceding generations (de Bassa, 2013; FINRA, 2013; Mottola, 2014; Kim *et al.*, 2019). Furthermore, they tend to self-assess their financial knowledge highly, being overconfident in their financial skills and capabilities (Kim *et al.*, 2019). In this regard, Bourke and Mechler (2010) and Gardner and Macky (2012) suggested that millennials are known for being more confident, narcissistic, and optimistic than previous generations.

Financial help-seeking behavior may act in a similar way to financial knowledge, especially in the case of individuals with self-control problems. Liu *et al.* (2019) found that personal financial advice is useful in nudging households with low levels of self-control toward saving. Nevertheless, millennials seem reluctant to seek personal financial advice (Kim *et al.*, 2019).

In sum, from the supply side, today's young adults face a more volatile macroeconomic era and more complicated financial markets than

Table 1
Description of dependent variables.

Variable	Definition	
Investment	Retirement product	Dichotomous variable equal to 1 if the respondent, personally or jointly, has any pension or retirement product (excluding compulsory products); 0 otherwise.
	Savings account	Dichotomous variable equal to 1 if the respondent, personally or jointly, has any saving or term deposit account or current account that cannot be used to make payments through cards or checks; 0 otherwise.
	Stock market participation	Dichotomous variable equal to 1 if the respondent, personally or jointly, has shares in any company, investment funds, and/or public or private fixed-income assets (e.g., bonds or treasury bills); 0 otherwise.
	Investment decision index	Continuous variable ranging from 0 to 3 depending on the type of investment products held.
Indebtedness	Personal loan	Dichotomous variable equal to 1 if the respondent, personally or jointly, has a personal loan; 0 otherwise.
	Mortgage	Dichotomous variable equal to 1 if the respondent, personally or jointly, has any mortgage; 0 otherwise.
	Indebtedness decision index	Continuous variable ranging from 0 to 2 depending on the type of debts held.
Positive financial attitudes	Planning horizon	Dichotomous variable equal to 1 if, on a scale from 1 (fully disagree) to 5 (fully agree), the respondent agrees or fully agrees that he/she has set long-term financial targets and strives to meet them; 0 otherwise.
	Expenditure planning	Dichotomous variable equal to 1 if the household plans for its expenses (i.e., the individual regularly decides that a portion of household income will be used for expenses, saving, or paying bills); 0 otherwise.
	Financial satisfaction	Dichotomous variable equal to 1 if, on a scale from 1 (fully disagree) to 5 (fully agree), the respondent agrees or fully agrees that he/she is satisfied with his/her current financial situation; 0 otherwise.
	Financial attitude index	Continuous variable ranging from 0 to 3 depending on self-reported financial attitude.

ever. From the demand side, they are less prepared to deal with this context than earlier generations (e.g., low levels of financial literacy, low levels of trust in the banking system and professional financial advice, low ability to delay gratification, more impulsive behavior…). Altogether, these circumstances point to some sort of perfect storm. Nevertheless, to date, no study has analyzed the effect of self-control on millennials' financial behaviors, which is worrisome considering that their financial behaviors will affect the financial well-being of the society as a whole. This study aims to fill this gap in the literature by testing the hypothesis that the relationship between self-control and financial behaviors may vary across generations. More specifically, the following hypothesis is proposed:

Hypothesis 4. ***(H4):*** The relationship between self-control and financial behaviors and attitudes differs between millennials and previous generations.

Table 2
Factor analysis and reliability of self-control scale.

Self-control statements	Cross factor loadings
I tend to live for today, without thinking about the future	0.76
I prefer spending money now to saving it for the future	0.80
Money is there to be spent	0.73

3. Data source and variables

3.1. Data source

This paper uses data from the Survey of Financial Competences (SFC), a joint initiative of the *Banco de España* and the *Comisión Nacional del Mercado de Valores* (Banco de España 2018). This survey, conducted between the end of 2016 and the second half of 2017, aimed to measure the financial knowledge of the Spanish adult population. The population of this study, randomly selected by means of personal interviews, is composed of around 7,000 Spanish individuals aged 18–79 years[1], of whom around 30 percent are millennials.

The SFC contains variables of different kinds (e.g., demographics and labor market status, sources of income, financial and economic literacy, attitudes to saving…). In what follows, the dependent and independent variables of our study are described.

3.2. Dependent variables

Different financial behaviors and attitudes serve as dependent variables for this paper (Table 1). Two types of financial decisions or behaviors are considered here: investment and indebtedness. Investment decisions are measured through three dichotomous variables that reflect whether the individual (personally or jointly) holds investments in pension or retirement products; saving or term deposit accounts; and stocks, investment funds, and/or public or private fixed income assets. Similarly, the indebtedness decisions are measured through two dichotomous variables indicating whether the individual (personally or jointly) holds, at the time of the interview, any personal loan or mortgage. Additionally, an index variable was constructed for each of the financial decisions considered, as the result of combining the answers to the previous questions. Thus, the investment index ranges from scores of 0 to 3, while the indebtedness index ranges from scores of 0 to 2.

Similarly, different financial attitudes that affect how individuals make their decisions about money are considered. Three dichotomous variables were constructed to measure whether the respondents have long-term financial goals, plan their expenditures, and are satisfied with their financial situation. Based on these questions, we also constructed an index of positive financial attitudes, scores ranging from 0 to 3.

3.3. Key independent variables

The self-control variable, consistent with Ameriks *et al.* (2007) and Gathergood (2012), is based on three statements taken from the SFC related to individual behavior concerning decisions on money. Respondents were asked to indicate their degree of agreement with each of the statements, using a scale from 1 to 5, where 1 denotes full disagreement and 5 full agreement. The three statements, summarized in Table 2, are the following: "I tend to live for today, without thinking about the future"; "I prefer spending money now to saving it for the future"; and "Money is there to be spent".

[1] The sample size used in this paper varies depending on each econometric specification, as some of the dependent and independent variables contain a different number of missing values. Thus, 7,431 individuals were considered in the econometric specifications on financial attitudes and 7,165 in those concerning financial investments.

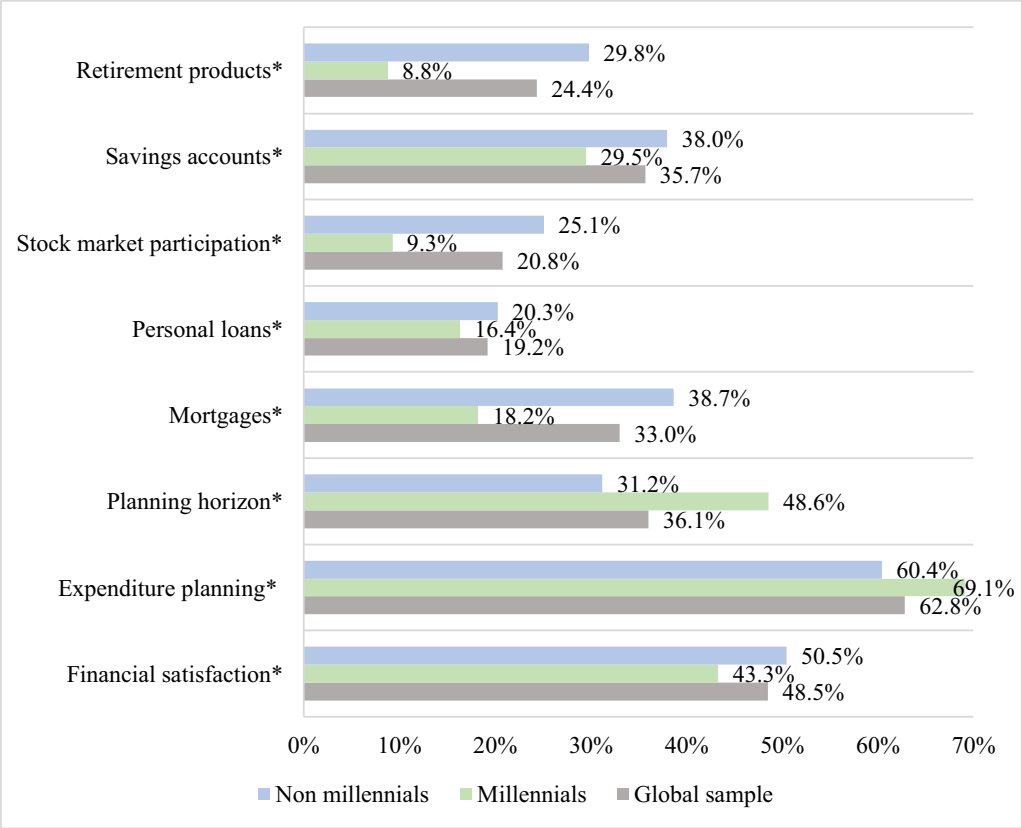

Fig. 1. Dichotomous dependent variables' means by sample
NOTES: * denotes the existence of statistically significant differences in means between both sub-samples (i.e., millennials and non-millennials) according to the results of the t-test of differences in means at a significance level of 0.1%.

In order to construct an operative finance-oriented self-control measure, we chose to use exploratory factorial analysis (EFA). Principal component analysis was used in EFA as an extraction methodology aimed at simplifying the factor structure, while Varimax was employed as a rotation method.

Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were used to confirm the appropriateness of the current data for the analysis. The first test returned a result of 0.64; the second demonstrated that it was significant ($p<0.000$). The factors explain 58.43 percent of total variance. Table 2 presents the factor loadings of the three statements considered in the construction of the self-control variable.These loads, which reflect the simple correlations between the items and the variable, along with the unique variance between the items and the factor plus the correlations between the factors (if any), show items with large coefficients. Specifically, it is shown that the three items load 0.76, 0.80, and 0.73, respectively. Those are high and similar values, which means that, taken in absolute values, the three items are closely related to the self-control variable.

Once scale reliability was confirmed, we continued creating the self-control variable taking into consideration the three aforementioned statements. Low or negative values for this new variable point to low levels of individual self-control, whereas high or positive values point to high levels of individual self-control.

Then, using individuals' self-control score as a starting point, two additional measures of self-control were created: (a) a dichotomous variable equal to 1 for those individuals whose self-control score is above the median level of self-control, and 0 otherwise; and (b) a categorical variable stating the quartiles stemming from individuals' level of self-control, ranging from 1 (the lowest level of self-control) to 4 (the highest level of self-control). These alternative measures of individuals' self-control are used in the robustness analysis.

3.4. Control variables

A variety of demographic and socioeconomic characteristics have been found to be associated with financial decisions and attitudes (e.g., Hira *et al.*, 2009; Yang and DeVaney, 2012; Arrondel and Savignac, 2015). Therefore, this paper includes different control variables such as age, gender, marital status, presence of dependent child(ren), education, employment status, household income, financial risk preferences, and overspending.

In addition to the above-mentioned control variables, we consider two relevant independent variables: objective financial knowledge and subjective financial knowledge. It is noteworthy that most studies on self-control and financial behaviors neglect the role played by financial knowledge in mitigating the potential self-control problems. To the best of our knowledge, only Gathergood (2012) and Gathergood and Weber (2014) included a measure of objective financial knowledge when analyzing the effect of self-control on household debt, and no study considers subjective financial knowledge. In this paper, objective financial knowledge is measured through an index based on the answers to four questions. Three out of the four questions (i.e., the ones about inflation, compound interest, and risk diversification) are close to the "Big Three" in the financial literacy (Lusardi and Mitchell, 2011) while the remaining question deals with the risk-return relationship (see Table A.1 in the Appendix A for a more comprehensive definition). This index ranges from 0 (all answers are wrong) to 4 (all four answers are correct). The variable referred to as subjective financial knowledge is

Table 3
Characterization of respondents: means of independent variables by sample.

		Global sample		Millennials		Non-millennials		Test (p-value)
		Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	
Self-control		0.047	0.979	-0.009	0.996	0.067	0.972	0.013
Objective financial knowledge		2.61	1.036	2.41	1.049	2.68	1.022	0.000
Subjective financial knowledge		2.62	0.830	2.71	0.782	2.59	0.844	0.000
Age		46.73	14.731	28.11	5.386	53.21	10.946	0.000
Gender		49.5%	0.500	51.4%	0.500	48.8%	0.500	0.807
Marital status: married		67.8%	0.467	40.5%	0.491	77.3%	0.419	0.000
Children		33.4%	0.472	24.4%	0.430	36.5%	0.481	0.000
Educational attainment	Primary education or lower	10.4%	0.305	2.7%	0.163	13.1%	0.337	0.000
	1st stage of secondary education or similar	24.5%	0.430	17.4%	0.379	27.0%	0.444	
	2nd stage of secondary education or similar	22.1%	0.415	30.2%	0.459	19.3%	0.395	
	Postsecondary non-tertiary education	13.9%	0.346	18.7%	0.390	12.3%	0.328	
	Tertiary education	29.0%	0.454	31.0%	0.463	28.4%	0.451	
Employment status		59.4%	0.491	62.9%	0.483	58.2%	0.493	0.0002
Income brand	< €14,500	26.4%	0.441	27.6%	0.447	26.0%	0.439	0.026
	€14,500-45,000	55.9%	0.497	58.3%	0.493	55.1%	0.497	
	> €45,000	17.7%	0.381	14.1%	0.348	18.9%	0.392	
Homeownership		81.6%	0.388	67.2%	0.470	86.6%	0.341	0.000
Risk aversion		43.3%	0.495	24.2%	0.429	49.9%	0.500	0.000
Overspending		24.4%	0.430	24.7%	0.431	24.4%	0.429	0.237

NOTES: In the case of the dichotomous and categorical variables, the value of the mean reports the percentage of people who fulfil the condition according to which those variables take the value set to 1. *St. dev*. stands for standard deviation. The last column reflects the mean difference t-test for dichotomous variables, and the Mann Whitney U test for ordered categorical variables.

based on the respondents' self-rated knowledge about financial matters using a Likert type scale that ranges from 1 (very low) to 5 (very high).

Table A.1 (Appendix A) presents a detailed description of all the independent variables included in this paper.

4. Results and discussion

This section includes the empirical evidence obtained from the univariate and multivariate analyses.

4.1. Univariate analyses

The mean value of the dichotomous dependent variables varies depending on the sample considered. Therefore, Figure 1 displays these values for the global sample, the millennial sub-sample, and the non-millennial sub-sample.

As regards investment decisions, non-millennials display higher rates of investment, regardless of the financial product considered. The difference between millennials and non-millennials is substantial in terms of investment in non-compulsory pension or retirement products, where the gap is close to 21 percentage points. The difference between both sub-samples in terms of stock market participation (15 percentage points) is also quite significant but is less noticeable in respect of savings accounts (8.5 percentage points).

Figure 1 evinces for the Spanish case what Mottola (2014), Foster *et al.* (2015), Yao and Cheng (2017), and Kim *et al.* (2019) found for the US population: millennials display lower rates of investment and lower ownership of retirement assets.

Concerning indebtedness, on average, 19.2 percent of the sample holds a personal loan and 33 percent has a mortgage. No considerable difference is found between millennials and non-millennials in terms of personal loans, the gap being close to 4 percentage points. However, this similarity disappears in the case of mortgages, where, on average, 38.7 percent of non-millennials have a mortgage as compared to 18.2% of millennials. The figures regarding personal loans contradict the evidence found by Cutler (2015) and Cornejo-Saavedra *et al.* (2017). This difference can be partly explained by the fact that these studies refer to an Anglo-Saxon context where, unlike the Spanish context, student loans are frequently used to finance youths' university studies.

In terms of financial attitudes, empirical evidence reveals that a greater percentage of millennials (48.6%) than of non-millennials (31.2%) set long-term financial objectives and strive to meet them. Similarly, a greater percentage of millennials (69.1%) than of non-millennials (60.4%) plan their expenditure, though in this case the gap is less noticeable. Kim *et al.* (2019) also found that, compared to the overall sample, a greater percentage of millennials have long-term planning horizons and have a budget, evidence that contradicts what is usually said about millennials, that they prefer immediate gratification. Finally, 43.3 percent of millennials declare themselves satisfied with their financial situation; a percentage quite close to that of non-millennials (50.5%).

The results of the t-test of the differences in means of the dependent variables point to the existence of significant differences between the sub-samples (millennials and non-millennials) for all variables.

Once the univariate analysis of the dependent variables is concluded, the next step consists of characterizing the sample and assessing whether there are significant differences between millennials and non-millennials in the independent variables. Table 3 displays the main summary statistics for the global sample and the two sub-samples considered.

Millennials display a lower level of self-control than non-millennials, reinforcing the idea that young adults, in general, have more difficulty controlling their impulses (Romer *et al.*, 2010). No major differences are found between the sub-samples regarding financial knowledge, in the case of objective financial knowledge or perceived financial knowledge. On a scale from 0 to 4, measuring the number of correct answers to four questions on financial literacy, data in Table 3 reflect that, on average, non-millennials gave slightly more correct answers (2.68) than millennials (2.41). In contrast, on a scale from 0 to 5, 5 being the highest rating, millennials exhibited a higher level of subjective knowledge (2.71) on average compared to non-millennials (2.59), which might reflect the millennials' overconfidence in their financial knowledge (Kim *et al.*, 2019), even though millennials seem to be less knowledgeable about financial issues than non-millennials. In fact, the percentage of respondents that correctly answered the four questions on financial literacy was 16.31 percent among millennials, increasing to 24.11 percent among non-millennials. Similarly, the percentage of millennials who failed to answer any question correctly was 2.59 percent (1.83

Table 4
Financial behaviors and attitudes: odds ratios of ordered logistic regression.

		INVESTMENT BEHAVIORS		INDEBTEDNESS BEHAVIORS		POSITIVE FINANCIAL ATTITUDES	
		Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial
Self-control		1.136*	1.189***	0.935	0.896***	1.508***	1.204***
		(0.062)	(0.035)	(0.055)	(0.027)	(0.065)	(0.032)
Objective financial knowledge		1.061	1.213***	0.882*	1.013	1.002	1.038
		(0.054)	(0.034)	(0.048)	(0.029)	(0.042)	(0.027)
Subjective financial knowledge		1.299***	1.317***	1.301***	1.051	1.326***	1.344***
		(0.092)	(0.046)	(0.098)	(0.037)	(0.071)	(0.042)
Age		1.057***	1.025***	1.137***	0.945***	0.941***	0.998
		(0.014)	(0.004)	(0.016)	(0.004)	(0.009)	(0.003)
Gender: female		0.978	1.053	1.032	0.965	1.092	1.246***
		(0.107)	(0.061)	(0.121)	(0.057)	(0.095)	(0.066)
Marital status: married		1.303†	0.893	2.959***	1.473***	1.253†	1.224***
		(0.186)	(0.064)	(0.486)	(0.118)	(0.152)	(0.078)
Dependent child(ren)		1.258	1.013	1.669***	1.358***	1.158	1.010
		(0.189)	(0.075)	(0.254)	(0.102)	(0.154)	(0.070)
Education		1.120***	1.159***	0.855***	0.980	0.935**	0.959**
		(0.034)	(0.018)	(0.029)	(0.017)	(0.023)	(0.014)
Employment situation		1.230†	1.398***	2.424***	1.612***	1.712***	1.030
		(0.153)	(0.103)	(0.344)	(0.118)	(0.163)	(0.066)
Income [Ref. <€14,500]	€14,500-45,000	2.167***	2.261***	1.109	1.321***	1.226*	1.118†
		(0.299)	(0.168)	(0.154)	(0.096)	(0.119)	(0.070)
	>€45,000	3.499***	4.526***	1.085	1.728***	1.646***	1.423***
		(0.694)	(0.483)	(0.238)	(0.187)	(0.249)	(0.139)
Homeownership		1.257†	2.032***	4.771***	3.957***	1.047	1.061
		(0.150)	(0.175)	(0.707)	(0.381)	(0.096)	(0.076)
Risk preferences: risk aversion		0.846***	0.860***	0.971	0.982	0.785***	0.804***
		(0.037)	(0.018)	(0.046)	(0.022)	(0.027)	(0.016)
Overspending		0.901	0.783***				
		(0.116)	(0.055)				
cut1		4.338	3.807	6.545	-0.889	-3.560	-1.647
		(0.417)	(0.273)	(0.448)	(0.268)	(0.306)	(0.233)
cut2		6.183	5.411	9.010	1.495	-1.417	0.428
		(0.423)	(0.278)	(0.469)	(0.271)	(0.297)	(0.231)
cut3		8.838	7.124		0.410	2.279	
		(0.466)	(0.286)		(0.296)	(0.233)	
N		1,965	5,200	2,042	5,349	2,058	5,373

NOTES: Table 4 shows the odds ratios of the ordered logit regression regarding investment and indebtedness decisions, and positive financial attitudes. The levels of significance are given by † for 10%
* for 5%
** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

percent for non-millennials).

The sample is almost equally distributed in terms of gender, and the average age of millennials (non-millennials) is close to 28 (53) years. Most non-millennials (77.3%) are married and 36.5 percent have dependent child(ren) living in their households. Both percentages are lower among millennials: half of millennials (40.5%) are married and almost a quarter (24.4%) have dependent child(ren).

Regarding educational attainment, millennials show higher educational attainment: indeed, they are considered "the most educated-minded generation in history" (Tulgan and Martin, 2001, p. 4). Thus, 30.2 percent (19.3%) of millennials (non-millennials) have completed the second stage of secondary education, 18.7 percent (12.3%) have completed post-secondary non-tertiary education, and 31 percent (28.4%) have studied at university (e.g., Bachelor's degree, Master's, doctorate studies).

A greater percentage of millennials (62.9%) are employed or self-employed compared to non-millennials (58.2%). Household income does not show large differences between the two sub-samples, but there are greater differences in terms of home ownership: 86.6 percent of non-millennials are the owner of their main residence, this percentage reducing to 67.2 percent among millennials. Less noticeable is the difference between the sub-samples regarding overspending, as around 24 percent of both millennials and non-millennials declared that in the last 12 months their expenses exceeded their income. The mean difference t-test for this variable reflects that there seem not to be statistically significant differences between the sub-samples of millennials and non-millennials, similarly to the gender variable.

The differences in terms of financial risk preferences are broader, where 24.2 percent of millennials are not prepared to risk their money when saving or making investments, a percentage that doubles among non-millennials (49.9%). Risk aversion is recognized as a defining attribute of the millennial generation. Millennials came of age during the recent economic turmoil, in an environment of uncertainty, which might have an important impact on their mindset in respect of different investment values, such as risk taking. However, Reisenwitz and Iyer (2009) found that millennials are generally more risk tolerant than the previous cohort (i.e., Generation X).

4.2. Multivariate analyses

Multivariate analyses are conducted in three stages. Firstly, given the ordered nature of the three indexes created, we estimate ordered logistic regression models aimed at achieving a more thorough understanding of the effect of self-control on investment and indebtedness decisions, and on financial attitudes (Hypotheses 1 to 3). It is noteworthy that aggregated indexes include financial behaviors with different time horizons. For that reason, in the second stage, binary logistic analyses are performed to explore separately the impact of self-control on a set of eight financial behaviors and attitudes. In both cases, the sub-samples of millennials and non-millennials are analyzed separately to test

Table 5
Financial decisions: marginal effects of logit estimations.

		INVESTMENT BEHAVIORS						INDEBTEDNESS BEHAVIORS			
		Retirement product		Savings account		Stock market participation		Personal loan		Mortgage	
		Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial
Self-control		0.008	0.007	0.025*	0.039***	-0.001	0.034***	-0.019*	-0.027***	0.011†	-0.006
		(0.008)	(0.006)	(0.012)	(0.008)	(0.007)	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)
Objective financial knowledge		-0.005	0.024***	0.019	0.006	0.000	0.040***	-0.020*	-0.002	-0.004	0.003
		(0.006)	(0.006)	(0.011)	(0.008)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)
Subjective financial knowledge		0.022*	0.028***	0.005	0.038***	0.041***	0.033***	0.030**	0.011	0.017*	0.0002
		(0.009)	(0.007)	(0.015)	(0.009)	(0.009)	(0.007)	(0.011)	(0.007)	(0.008)	(0.007)
Age		0.010***	0.002**	0.002	0.004***	0.005**	0.006***	0.009***	-0.004***	0.014***	-0.012***
		(0.002)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Gender: female		-0.014	-0.009	0.008	0.022	-0.019	0.009	-0.001	-0.018	0.0005	0.004
		(0.014)	(0.012)	(0.025)	(0.015)	(0.013)	(0.012)	(0.017)	(0.011)	(0.013)	(0.012)
Marital status: married		0.011	-0.013	0.077*	-0.029	0.005	-0.001	0.059*	0.036**	0.149***	0.083***
		(0.017)	(0.016)	(0.033)	(0.019)	(0.018)	(0.015)	(0.023)	(0.014)	(0.023)	(0.015)
Dependent child(ren)		0.038*	-0.014	0.005	0.005	0.015	0.017	0.031	-0.006	0.063**	0.090***
		(0.019)	(0.016)	(0.034)	(0.019)	(0.020)	(0.015)	(0.024)	(0.014)	(0.020)	(0.016)
Education		0.005	0.013***	0.013	0.016***	0.010*	0.029***	-0.025***	-0.010**	-0.005	0.003
		(0.004)	(0.003)	(0.007)	(0.004)	(0.004)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)
Employment situation		0.032*	0.170***	0.03	-0.006	-0.001	-0.021	0.101***	0.061***	0.041**	0.069***
		(0.016)	(0.017)	(0.028)	(0.019)	(0.017)	(0.015)	(0.018)	(0.014)	(0.016)	(0.015)
Income [Ref. <€14,500]	€14,500-45,000	0.062**	0.092***	0.103***	0.143***	0.057**	0.104***	0.017	0.027	0.004	0.054***
		(0.019)	(0.015)	(0.029)	(0.019)	(0.019)	(0.015)	(0.019)	(0.014)	(0.016)	(0.014)
	>€45,000	0.112**	0.272***	0.122**	0.209***	0.194***	0.194***	0.003	0.067**	0.022	0.096***
		(0.043)	(0.027)	(0.047)	(0.029)	(0.051)	(0.027)	(0.034)	(0.024)	(0.024)	(0.023)
Homeownership		0.019	0.086***	0.028	0.137***	0.025	0.050**	0.002	-0.012	0.272***	0.363***
		(0.014)	(0.017)	(0.026)	(0.021)	(0.014)	(0.016)	(0.018)	(0.016)	(0.012)	(0.012)
Risk preferences: risk aversion		-0.004	-0.013**	-0.032**	-0.014*	-0.023***	-0.050***	-0.008	-0.009*	0.003	0.003
		(0.005)	(0.005)	(0.010)	(0.006)	(0.006)	(0.004)	(0.007)	(0.004)	(0.005)	(0.004)
Overspending		-0.016	-0.028	-0.014	-0.042*	-0.004	-0.042**				
		(0.016)	(0.015)	(0.028)	(0.018)	(0.017)	(0.014)				
N		1,752	5,012	1,530	4,075	1,830	4,872	1,926	5,195	2,028	5,322
R^2 McFadden		0.169	0.127	0.044	0.064	0.1394	0.159	0.1177	0.038	0.4307	0.2244
Wald X^2 (d.f.)		142.98*** (14)	654.6*** (14)	70.60*** (14)	307.03*** (14)	141.96*** (14)	692.81*** (14)	190.98*** (13)	191.1*** (13)	417.49*** (13)	1075.9*** (13)
Pseudolikelihood		-433.3	-2667.5	-887.6	-2534.0	-486.9	-2309.6	-757.1	-2520.7	-548.5	-2754.9
Akaike's criterium		896.6 (15)	5364.9 (15)	1805.1 (15)	5098.0 (15)	1003.9 (15)	4649.3 (15)	1542.2 (14)	5069.4 (14)	1125.0 (14)	5537.2 (14)
Hosmer-Lemeshow X^2		5.84	4.82	15.05†	8.02	7.76	11.43	13.53†	3.91	14.59†	19.19*

NOTES: Table 5shows the marginal effects of the logit estimates regarding investment and indebtedness behaviors. The levels of significance are given by † for 10%
* for 5%
** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Table 6
Positive financial attitudes: marginal effects of the logit estimations.

		POSITIVE FINANCIAL ATTITUDES					
		Planning horizon		Expenditure planning		Financial satisfaction	
		Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial
Self-control		0.078***	0.044***	0.056***	0.027***	0.050***	0.020**
		(0.010)	(0.006)	(0.010)	(0.007)	(0.010)	(0.007)
Objective financial knowledge		0.004	0.009	-0.008	0.005	0.002	0.006
		(0.011)	(0.006)	(0.010)	(0.007)	(0.010)	(0.007)
Subjective financial knowledge		0.099***	0.054***	0.01	0.034***	0.024	0.050***
		(0.013)	(0.007)	(0.013)	(0.008)	(0.013)	(0.008)
Age		-0.009***	-0.004***	-0.005*	-0.006***	-0.014***	0.009***
		(0.003)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)
Gender: female		0.041	0.047***	0.018	0.053***	-0.013	0.003
		(0.022)	(0.013)	(0.021)	(0.014)	(0.022)	(0.013)
Marital status: married		0.053	0.029	0.041	0.051**	0.009	0.015
		(0.030)	(0.015)	(0.028)	(0.017)	(0.030)	(0.016)
Dependent child(ren)		-0.023	0.024	0.031	-0.015	0.061	-0.017
		(0.033)	(0.016)	(0.031)	(0.018)	(0.032)	(0.018)
Education		-0.014*	-0.009**	-0.01	-0.008*	-0.007	-0.001
		(0.006)	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)
Employment situation		0.085***	0.011	-0.017	-0.058***	0.170***	0.065***
		(0.025)	(0.015)	(0.024)	(0.016)	(0.024)	(0.016)
Income [Ref. <€14,500]	€14,500-45,000	-0.04	-0.033*	-0.009	-0.099***	0.144***	0.168***
		(0.025)	(0.015)	(0.024)	(0.016)	(0.024)	(0.015)
	>€45,000	-0.029	-0.013	-0.03	-0.139***	0.289***	0.292***
		(0.039)	(0.022)	(0.039)	(0.026)	(0.035)	(0.021)
Homeownership		-0.012	-0.005	-0.029	-0.076***	0.056*	0.115***
		(0.024)	(0.017)	(0.022)	(0.019)	(0.024)	(0.019)
Risk preferences: risk aversion		-0.079***	-0.069***	-0.025**	-0.011*	-0.008	-0.019***
		(0.008)	(0.004)	(0.008)	(0.005)	(0.009)	(0.005)
N		2,049	5,334	2,050	5,369	2,058	5,371
R^2 McFadden		0.08	0.086	0.0265	0.0327	0.0719	0.0885
Wald X^2 (d.f.)		192.88† (13)	491.33† (13)	66.77* (13)	223.68* (13)	170.22† (13)	556.05† (13)
Pseudolikelihood		-1301.7	-3026.6	-1234.4	-3485.7	-1306.9	-3393.1
Akaike's criterium		2631.3 (14)	6081.1 (14)	2496.8	6999.4	2641.9 (14)	6814.2
Hosmer-Lemeshow X^2		5.28	4.23	15.46*	8.68	13.66†	4.72

NOTES: Table 6shows the marginal effects of the logit estimates regarding positive financial attitudes. The levels of significance are given by † for 10%
* for 5%
** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Hypothesis 4. Thirdly, we repeat the second stage analyses using alternative measures of individuals' self-control to examine the robustness of the results. Finally, a summary of the main findings is included.

4.2.1. Ordered logistic regression

The ordinal regression model (ORM) is commonly presented as a latent variable model. Defining y^* as a latent variable ranging from -∞ to ∞, the structural model is as follows:

$$y_i^* = x_i\beta + \varepsilon_i,$$

where i is the observation and ε is a random error.

The measurement model for binary outcomes is expanded to divide y^* into J ordinal categories:

$$y_i = m \, if \, \tau_{m-1} \leq y_i^* < \tau_m \, \text{for} \, m = 1 \, to \, J$$

where the thresholds or cut-off points τ_1 through τ_{J-1} are estimated.

The standard formula for predicted probability in the ORM is:

$$\Pr(y = m \,|\, x) = F(\tau_m - x\beta) - F(\tau_{m-1} - x\beta)$$

where F is the cumulative density function for ε. In ordinal logit, F is logistic with $\text{Var}(\varepsilon) = \pi^2/3$. See Long and Freese (2014) for a further description.

Table 4 displays the odds ratios of the ordered logistic regression of the index variables considered for each of the sub-samples, millennials and non-millennials. A first glance at the results allows us to confirm the proposed hypotheses. As regards the first three hypotheses, the estimated odd ratios support the existence of a statistically significant impact of self-control on the financial decisions and attitudes considered in the empirical analysis. Thus, as expected, individuals' self-control positively affects investment decisions (H1) and positive financial attitudes (H3), while it negatively affects indebtedness decisions (H2).

Additionally, empirical evidence partly confirms H4, establishing a different effect of self-control upon the financial behaviors and attitudes of millennials and non-millennials. Indeed, the impact of self-control on positive financial attitudes is greater in the sub-sample of millennials, while the investment decisions of non-millennials seem to be positively affected by their level of self-control to a greater extent than those of millennials. In contrast, the effect of self-control on indebtedness decisions is significantly negative among non-millennials, while it fails to be significant among millennials.

4.2.2. Logistic regression

As previously indicated, the second stage of the multivariate analysis consists of more detailed analysis of the effect of self-control on the individual questions in each of the financial decisions and attitudes considered. Thus, eight econometric models are presented for each of the sub-samples. We opt for logit regressions, that consider a non-linear relationship between the explained variable and the set of explanatory variables selected for the empirical study, based on the following expression:

$$Pr(y = 1|x) = Pr(\varepsilon > -\{\alpha + \beta x\}|x)$$

The probability that an individual belongs to a group depends on the distribution of ε which, in the case of logit models, is assumed to be distributed logistically with $\text{Var}(\varepsilon)=\pi^2/3$, leading to the binary logit

model with the simpler equation (Long and Freese, 2014):

$$Pr(y=1|x) = \exp(\alpha+\beta x)/(1+\exp(\alpha+\beta x))$$

where y denotes the dependent variable—i.e., $y_i = \phi\ (\beta_0 + \beta_1 Self\text{-}control_i + \beta_j X_i)$, i being the index for each respondent, *Self-control* the scale of individuals' self-control, and X_i the remaining key independent variables and the control variables.

Empirical evidence in Table 4 clearly confirms the positive and statistically significant effect of individuals' self-control on investment decisions (H1). However, empirical evidence in Table 5 shows that this effect does not hold across all the decisions that are part of the investment decision index. Thus, the estimated marginal effects show that the higher the individual's self-control, the higher the probability of holding savings accounts, risky assets, and/or public or private fixed-income assets. This evidence is stronger for the sample of non-millennials, thus confirming Hypothesis 4. Differently from Kimball and Shumway (2009), empirical evidence fails to confirm the positive effect of self-control on investment in products specifically tailored for retirement, such as voluntary pensions.

As expected, individuals' level of financial self-control is negatively related to the decision to take out a personal loan. This finding is consistent with those of Gathergood and Weber (2014) and Achtziger *et al.* (2015), and it partly confirms Hypothesis 2. In contrast, no statistically significant effect is found regarding the probability of holding on a mortgage.

Previous results seem to indicate that financial decisions involving long time horizons (i.e., retirement saving and mortgages) are not affected by the individual's self-control, regardless of the sub-sample considered. In other words, self-control seems to impact only on financial behaviors with short-term consequences. There is one more nuance in the case of indebtedness decisions, because mortgages tend to be subjected to harder underwriting processes by banks than personal loans. In other words, holding a mortgage is to some extent a less volitional behavior than holding a personal loan. Previous estimates support the arguments stemming from the TPB in favor of the effect of self-control on volitional financial behaviors.

Empirical evidence seems to point to a different impact of self-control on millennials and non-millennials' decision to take out a personal loan. The estimates in Table 5 reflect that the negative effect of self-control on this financial decision has a slightly greater impact on the non-millennial sample, thus at least partially supporting Hypothesis 4.

The effect of self-control on the three financial attitudes considered in this paper is more powerful than its effect on the investment and indebtedness decisions considered, as it reveals the positive and statistical significance found in Table 6, confirming Hypothesis 3. Moreover, the impact of self-control is greater for millennials (differently from what happens regarding the effect of self-control on the financial decisions considered), thus supporting Hypothesis 4. Therefore, the greater individuals' control over their own impulses, the greater the probability of setting long-term financial objectives and planning expenditure, and the greater their satisfaction with their financial situation. This last finding is consistent with those of Biljanovska and Palligkinis (2014) and Strömbäck *et al.* (2017).

In respect of financial knowledge, while subjective financial knowledge is positively related to investment decisions and financial attitudes overall, objective financial knowledge fails to be statistically significant in most of the estimated models (Tables 4–6). In this regard, individuals' confidence in their own financial knowledge seems to foster the different investment decisions and financial attitudes considered here. In contrast, those millennials who have greater confidence in their own financial knowledge are more likely to incur debt (both personal loans and mortgages). This could reflect that millennials are overconfident in their financial skills and capabilities (Kim *et al.*, 2019), or, as Barney (2017) acknowledges, that millennials are not completely aware of their lack of financial knowledge, and hence they participate in the financial market as if they had such knowledge (de Bassa and Lusardi, 2014). Therefore, the results are in line with previous research as they show that young adults lack the basic skills required to make savvy financial choices (Lusardi *et al.*, 2010). However, it seems that in the case of the millennial generation, this challenge is even more pressing, and financial literacy is severely lacking among them (Lusardi and Oggero, 2017). Even though millennials have experienced a major financial crisis in recent years, they do not seem to be concerned with improving their financial literacy and still demonstrate relatively low knowledge (Shahrabani, 2013).

Where the remaining independent variables are concerned, empirical evidence fails to confirm that gender influences any of the financial decisions considered. However, in terms of financial attitudes, non-millennial women seem more likely to set long-term financial goals and plan their expenditures. Marital status clearly drives indebtedness decisions—i.e., those people who live with their partners/spouses are more likely to apply for personal loans and mortgages. Altundere (2014) and Brown *et al.* (2016) also found that married household heads are more likely to have mortgages, which might reflect the fact that secured loans are the joint liability of both members of a couple. However, previous empirical studies find little evidence of a positive effect on personal loans of living with the partner/spouse. Similarly, those who have dependent child(ren) at their homes are more likely to have a mortgage.

Overall, educational attainment positively influences investment decisions. However, its effect is only statistically significant for non-millennials. The effect of educational attainment on indebtedness decisions, especially on personal loans, is negative—that is, the higher the educational attainment of the respondent (either millennial or non-millennial), the lower his/her probability of having a personal loan. The effect of formal education upon planning horizon and expenditure planning is also negative, differing from what was expected.

Employed or self-employed individuals, compared to people with other job tenures, are more likely to hold non-compulsory pension or retirement assets (e.g., corporate pension plans), as previous literature acknowledges, and are also more likely to incur debt -in form of either a personal loan or a mortgage-. Having employment in many cases constitutes a requirement that banks impose on customers that apply for a mortgage, whereas in the case of personal loans—i.e., unsecured debt—being employed might constitute a kind of collateral. Being employed also relates positively to the establishment of long-term financial goals (only in the case of millennials) and to the individual's financial satisfaction, whereas it relates negatively to expenditure planning.

The greater the household income, the greater the probability of investment, regardless of financial product, among millennials and non-millennials; the greater the probability of non-millennials having debt; and the greater the financial satisfaction. However, the greater the household income, the lower the probability of non-millennials planning their expenditures.

As regards home ownership, empirical evidence reveals that home owners are more likely to invest, regardless of the financial product considered; but oddly, this evidence is only statistically significant for the sample of non-millennials. As expected, home owners are more likely to have a mortgage, but they also have a greater likelihood of being satisfied with their personal financial situation.

Finally, where risk preferences are concerned, empirical evidence reveals that risk-averse individuals are less willing to invest in any of the products considered and are less likely to have personal loans (though this last relationship is only statistically significant in the sub-sample of non-millennials). These results are analogous to those of Yang and DeVaney (2012) regarding participation in voluntary pension schemes, or Ampudia (2013) and Arrondel and Savignac (2015) regarding investment in risky financial assets. Risk aversion also exerts a negative influence on all of the three positive financial attitudes analyzed here.

Table 7.
Summary of main findings regarding self-control.

	Hypothesis 1 to 3: The effect of self-control on financial behaviors and attitudes (sign of the effect)		Hypothesis 4: The effect of self-control across millennials and non-millennials (size of the effect)
	Millennials	Non-millennials	Millennials vs Non-millennials
Hypothesis 1: Investment behaviors	+	+	<
Retirement	0	0	0
Saving account	+/ Q4	+	<
Risky assets	0	+	<
Hypothesis 2: Indebtedness behaviors	0	-	<
Personal loans	-/ Q4	-	<
Mortgages	0	0	0
Hypothesis 3: Financial attitudes	+	+	>
Long-term goals	+	+	>
Expenditure planning	+	+	>
Financial satisfaction	+	+	>

Note: (+/ - /) denotes positive/negative/not significant effect of self-control on financial behaviors and attitudes by sub-sample. Q4 denotes that individual belongs to the fourth quartile of self-control score distribution.

4.2.3. Robustness check

To check the robustness of the results, we repeat the logit estimations of the previous section considering the two alternatives measures of individuals' self-control. Tables B.1 and B.2 (Appendix B) report the models for the dichotomous and the categorical self-control variables, respectively, and overall they confirm what was previously found. Additionally, though, the empirical evidence in Table B.2 reveals that only two of millennials' financial decisions are affected by their self-control: holding savings accounts and raising personal loans. In both cases, the effect of self-control is statistically significant only for those individuals who exhibit the highest level of self-control (i.e., those whose level of self-control belongs to the fourth quartile).

Finally, Table 7 illustrates the main findings for the variables of interest (i.e., the measures of self-control). Two key conclusions can be drawn from the previous analyses. With respect to the first aim of the study, it can be concluded that individuals' financial self-control clearly impacts financial attitudes and some financial decisions, particularly those that have consequences in the short-term. In contrast, individuals' financial self-control seems not to influence those financial decisions whose consequences are significantly deferred (i.e., mortgage and retirement savings). Overall, these results hold regardless of the sub-sample analyzed. Lades and Hofmann (2019) remark that people tend to be more serene and thoughtful when making decisions for the distant future than when making decisions for the near future. Therefore, those decisions that pay off in the distant future, like saving for retirement, might be less affected by a lack of self-control—that is, self-control constitutes less of a driving force influencing these long-term decisions.

Regarding the second aim of the research, the effect of self-control on financial behaviors differs across millennials and previous generations. Thus, the significance of the positive effect of self-control on financial attitudes is clearly higher in the sub-sample of millennials. Moreover, self-control seems not to be relevant for millennials' other financial decisions unless the individual exhibits the highest level of self-control (Q4), in which case it also impacts on holding a saving account (positively) or a personal loan (negatively). In contrast, the highest level of self-control does not seem to affect the financial decisions of older generations.

5. Conclusion

Self-control has recently emerged as one of the attitudinal traits that may affect individuals' financial behaviors. Previous studies have examined a limited number of financial decisions. Additionally, no study has addressed this issue in the millennial generation to date. Although it is generally acknowledged that young adults exhibit low levels of self-control regardless of generation, the circumstances in which millennials have been raised worsen the dangers resulting from bad financial decisions because of self-control problems.

The first aim of this study was to analyze the influence of self-control on a wide set of financial behaviors and attitudes. More specifically, it examined the impact of financial self-control on investment and indebtedness behaviors, as well as on financial attitudes. The second aim was to explore whether the effect of self-control on financial behaviors differs across millennials and previous generations. This issue was addressed by using a sample of 7,000 Spanish individuals, around 30 percent of whom were millennials.

5.1. Implications

The findings confirm that individuals' level of self-control is related to a positive financial attitude. Thus, a high level of self-control increases the probability of setting long-term financial goals and expenditure planning, along with the individual's financial satisfaction. Regarding financial behaviors or decisions, those individuals with a high level of self-control are more likely to save and invest in stock markets, while they are less likely to hold personal loans. In contrast, financial decisions involving long time horizons (i.e., retirement saving and mortgages) seem not to be influenced by the individual's self-control. In other words, self-control does not matter for financial decisions whose consequences are significantly deferred. These results confirm that "the relationship between self-control and financial behavior is still inconclusive", as Strömbäck *et al.* (2017, p. 31) remarked. However, they are in line with previous arguments on the lack of self-control—i.e., time-inconsistencies are linked to the short term, as people are more patient and thoughtful when making decisions for the distant future than when making decisions for the near future (Lades and Hofmann, 2019). Therefore, those financial decisions that involve a delay to obtain a reward may be less affected by a lack of self-control.

With respect to the second aim of the study, the impact of self-control on financial behaviors differs across millennials and preceding generations. The most shocking finding was that financial decisions seem not to be affected by self-control in the millennial generation, except for holding a savings account or a personal loan, and in these cases, self-control only plays a statistically significant role for those millennials who exhibit the highest level of self-control.

Another interesting finding of this study is related to financial

knowledge. Unlike objective financial knowledge, self-assessed financial knowledge impacts on individuals' financial behaviors and attitudes. Moreover, while self-assessed financial knowledge is consistently associated with positive behaviors for non-millennials, it seems to work in a slightly different way for millennials. Thus, those millennials who perceive themselves as highly financially literate are more likely to be in debt. This finding warns of a potentially dangerous overconfidence among millennials in their financial management skills.

The study results can help policymakers design interventions to improve millennials' financial behaviors. The findings indicate that individuals' level of self-control is positively related to good financial behaviors and attitudes. Therefore, it is important to make individuals aware of the need to control their first impulses. According to Achtziger *et al.* (2015), self-control can be trained. Financial education programs should therefore help individuals to assess the long-term consequences of their present financial decisions and attitudes, and to introduce them to the use of planning strategies to reach long-term financial goals. Such practice-oriented training becomes more relevant than simply explaining core financial concepts, since objective financial literacy seems not to play a crucial role in making financial decisions, while subjective financial literacy does. It is also important to make individuals, especially millennials, aware of the extent to which their level of subjective financial knowledge corresponds to their level of objective financial knowledge, in order to avoid bad decisions because of a potentially dangerous overconfidence.

5.2. Limitations

This study presents some limitations. Firstly, the major limitation of this study is clearly the cross-sectional nature of the dataset, which prevents the observation of millennials at different stages of their life-cycle to know whether their financial behaviors differ from those of the today's Generation X when the millennials are in their fifties. Secondly, the study refers to Spanish data. Financial behaviors have cultural dimensions (Liu *et al.*, 2019) and the findings obtained for Spaniards may not be applicable to other countries. Schewe *et al.* (2013) suggest that even though millennials tend to have the same values worldwide, some differences arise, probably originating in the different cultural upbringings in different countries. It could be helpful to extend the study to other cultures and countries. Thirdly, the investment and indebtedness decisions have been measured through dummy variables. In this respect, this study is limited by the lack of information in the SCF about savings, investments, personal loans, and mortgages. This information would allow a better assessment of the extent to which self-control influences such decisions. Finally, despite this study including a complete set of the driving forces of financial behaviors considered in prior financial literature, other factors may be overlooked that could also affect young people's financial behaviors, such as emotions. Shahrabani (2012) and Chakraborty (2019) considered the influence of emotions on the intention to budget and on investment decisions, respectively. Therefore, future research in the field of self-control and millennials' financial behaviors might benefit from the consideration of additional driving forces.

Funding source

None.

Declaration of Competing Interest

The authors have no competing interests to declare.

Acknowledgements

The authors wish to thank the associate editor and the two anonymous referees for their insightful and constructive comments and suggestions.

Appendix A

Table A.1

Table A.1
Description of independent variables.

Variable	Definition
Self-control	Continuous variable representing respondents' self-control constructed by applying EFA (for more information, see Section 3.3)
Objective financial knowledge	Continuous variable ranging from 0 to 4 on the number of correct answers to the following questions on financial literacy: a. Let's suppose you deposit €100 in a savings account with fixed interest of 2% per annum. In this account there are no commissions or taxes. If you make no deposit or withdrawal, once the interest has been paid to you, how much money will there be in the account after five years? [Over €110/Exactly €110/Less than €110/it is impossible to say with the information given/Other answers] b. It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares [True/False] c. Imagine that five siblings had to wait a year to obtain their share of €1,000, and that inflation that year was 1%. Within one year they will be capable of buying… [More than they could today with their share of money/The same amount/Less than what they could buy today/…] d. An investment with a high return is also likely to be high-risk [True/False]
Perceived financial knowledge	Continuous variable representing the respondent's self-rated knowledge about financial matters, ranging from 1 (very low) to 5 (very high)
Age	Continuous variable representing the respondent's age
Gender	1 if the respondent is female; 0 if male
Marital status	1 if the respondent usually lives in his/her household with his/her partner/spouse; 0 otherwise
Dependent children	1 if the respondent usually lives in his/her household with his/her own (or his/her partner/spouses') children under the age of 18; 0 otherwise
Education	Continuous variable representing the highest level of educational attainment of the respondent
Employment status	1 if the respondent is employed or self-employed; 0 otherwise
Income	Categorical variable on the total annual gross income of the household. Three categories: <€14,500; €14,500-45,000; and >€45,000
Home ownership	1 if the respondent is the owner of his/her main residence (through purchase; inheritance, or gift); 0 otherwise
Financial risk preferences	1 if, on a scale from 1 (fully disagree) to 5 (fully agree), the respondent agrees or fully agrees that he/she is not prepared to risk some of his/her money when saving or making investments; 0 otherwise
Overspending	1 if in the last 12 months the respondent's household income was not sufficient to meet his/her current expenditure (food, loan payments, electricity, water, leisure, insurance, …); 0 otherwise

Appendix B

Table B.1 and B.2.

Table B.1
Robustness check with self-control dummy: marginal effects on the logit estimations.

	INVESTMENT						DEBT				FINANCIAL ATTITUDES					
	Retirement product		Savings account		Stock market participation		Personal loan		Mortgage		Planning horizon		Expenditure planning		Financial satisfaction	
	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial
Self-control dummy	0.02	0.022	0.053*	0.070***	0.002	0.050***	-0.008	-0.04***	0.02	-0.011	0.129***	0.072***	0.079***	0.046***	0.102***	0.038**
	(0.013)	(0.012)	(0.024)	(0.015)	(0.013)	(0.011)	(0.016)	(0.011)	(0.013)	(0.011)	(0.021)	(0.012)	(0.021)	(0.013)	(0.021)	(0.013)
Objective financial knowledge	-0.004	0.024***	0.019	0.006	0.000	0.040***	-0.020*	-0.002	-0.004	0.003	0.005	0.009	-0.007	0.005	0.003	0.006
	(0.006)	(0.006)	(0.011)	(0.008)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)	(0.011)	(0.006)	(0.010)	(0.007)	(0.010)	(0.007)
Subjective financial knowledge	0.021*	0.028***	0.004	0.038***	0.041***	0.033***	0.029**	0.011	0.016*	0.001	0.101***	0.053***	0.011	0.034***	0.025	0.050***
	(0.009)	(0.007)	(0.015)	(0.009)	(0.009)	(0.007)	(0.011)	(0.007)	(0.008)	(0.007)	(0.013)	(0.007)	(0.013)	(0.008)	(0.013)	(0.008)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,754	5,040	1,531	4,091	1,832	4,902	1,929	5,223	2,031	5,356	2,052	5,367	2,053	5,404	2,061	5,406

NOTES: Table B.1shows the marginal effects of the logit estimates. The levels of significance are given by † for 10%
* for 5%
** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Table B.2.
Robustness check with self-control dummy: marginal effects on the logit estimations.

		INVESTMENT						DEBT				FINANCIAL ATTITUDES					
		Retirement product		Savings account		Stock market participation		Personal loan		Mortgage		Planning horizon		Expenditure planning		Financial satisfaction	
		Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial	Millennial	Non-millennial
Self-control [Ref. 1st quartile]	2nd quartile	-0.03	0.005	0.033	0.055*	-0.020	0.041*	-0.032	-0.044**	0.032	-0.027	0.090**	0.036*	0.055*	0.021	0.018	0.015
		(0.017)	(0.017)	(0.034)	(0.022)	(0.018)	(0.017)	(0.021)	(0.014)	(0.020)	(0.016)	(0.028)	(0.018)	(0.026)	(0.018)	(0.029)	(0.018)
	3rd quartile	-0.006	0.02	0.055	0.073***	0	0.055**	-0.008	-0.059***	0.026	-0.026	0.12***	0.08***	0.05	0.048**	0.079**	0.037*
		(0.018)	(0.017)	(0.035)	(0.022)	(0.018)	(0.017)	(0.022)	(0.014)	(0.020)	(0.016)	(0.029)	(0.018)	(0.026)	(0.018)	(0.030)	(0.018)
	4th quartile	0.012	0.007	0.087*	0.105***	-0.01	0.085***	-0.043*	-0.065***	0.036	-0.019	0.22***	0.12***	0.16***	0.075***	0.11***	0.054**
		(0.020)	(0.018)	(0.037)	(0.022)	(0.019)	(0.018)	(0.021)	(0.014)	(0.020)	(0.017)	(0.028)	(0.019)	(0.024)	(0.018)	(0.030)	(0.018)
Objective financial knowledge		-0.005	0.024***	0.019	0.006	0.000	0.041***	-0.020*	-0.001	-0.004	0.003	0.005	0.009	-0.007	0.005	0.002	0.007
		(0.007)	(0.006)	(0.011)	(0.008)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)	(0.011)	(0.006)	(0.010)	(0.007)	(0.010)	(0.007)
Subjective financial knowledge		0.022*	0.029***	0.004	0.038***	0.04***	0.033***	0.030**	0.011	0.016*	0	0.10***	0.05***	0.01	0.035***	0.024	0.050***
		(0.009)	(0.007)	(0.015)	(0.009)	(0.009)	(0.007)	(0.011)	(0.007)	(0.008)	(0.007)	(0.013)	(0.007)	(0.013)	(0.008)	(0.013)	(0.008)
Control variables		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		1,752	5,012	1,530	4,075	1,830	4,872	1,926	5,195	2,028	5,322	2049	5334	2050	5369	2058	5371

NOTES: Table B.2shows the marginal effects of the logit estimates. The levels of significance are given by † for 10%
* for 5%
** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

References

Achtziger, A., Hubert, M., Kenning, P., Raab, G., & Reisch, L. (2015). Debt out of Control: The Links between Self-Control, Compulsive Buying, and Real Debts. *Journal of Economic Psychology, 49*, 141–149. https://doi.org/10.1016/j.joep.2015.04.003.

Afandi, E., & Habibov, N. (2013). *Pre-Crisis and Post-Crisis Trust in Banks: Lessons from Transitional Countries. MPRA*. University Library of Munich. Paper 46999.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T.

Altundere, M. (2014). The Relationship Between Sociability and Household Debt. *ADAM AKADEMİ Sosyal Bilimler Dergisi, 4*(2), 27–58. https://doi.org/10.31679/adamakademi.167248.

Ameriks, J., Caplin, A., Leahy, J., & Tyler, T. (2007). Measuring Self-Control Problems. *American Economic Review, 97*(3), 966–972. https://doi.org/10.1257/aer.97.3.966.

Ampudia, M. (2013). Stockholding in Spain. *SERIES- Journal of the Spanish Economic Association, 4*(4), 415–435. https://doi.org/10.1007/s13209-013-0099-x.

Arrondel, L., & Savignac, F. (2015). Risk Management, Housing and Stockholding. *Applied Economics, 47*(39), 4208–4227. https://doi.org/10.1080/00036846.2015.1026585.

Aruna, S., & Santhi, P. (2015). Impulse Purchase Behavior Among Generation-Y. *The IUP Journal of Marketing Management, 14*(1), 21–38. https://ssrn.com/abstract=2805619.

Atkinson, A., & Messy, F. A. (2011). Assessing Financial Literacy in 12 Countries: An OECD/INFE International Pilot Exercise. *Journal of Pension Economics & Finance, 10*(4), 657–665. https://doi.org/10.1017/S1474747211000539.

Bakewell, C., & Mitchell, V. W. (2003). Generation Y Female Consumer Decision-Making Styles. *International Journal of Retail & Distribution Management, 31*(2), 95–106. https://doi.org/10.1108/09590550310461994.

Banco de España, CNMV, 2018. Survey of Financial Competences 2016. Available at https://app.bde.es/pmk/es/ecf/2016 In-text citation should be as follows: Banco de Espaa and CNMV (2018).

Barney, L., 2017. Millennials Need Financial Education. Available at https://www.plansponsor.com/Millennials-Need-Financial-Education/.

Biljanovska, N., & Palligkinis, S. (2014). Control Thyself: Self-Control Failure and Household Wealth. *Journal of Banking & Finance, 92*, 280–294. https://doi.org/10.2139/ssrn.2509080.

Birkenmaier, J., & Fu, Q. (2016). The Association of Alternative Financial Services Usage and Financial Access: Evidence from the National Financial Capability Study. *Journal of Family and Economic Issues, 37*(3), 450–460. https://doi.org/10.1007/s10834-015-9463-2.

Bishop, I. (2006). *Hill Scolds Lazy Millennials – 'They Have to Do Their Part*. New York Post. March 12. Available at http://nypost.com/2006/05/12/hill-scolds-lazy-Millennials-they-have-to-do-their-part/.

Bourke, B., & Mechler, H. S. (2010). A New Me Generation? The Increasing Self-Interest among Millennial College Students. *Journal of College and Character, 11*(2). https://doi.org/10.2202/1940-1639.1034.

Brown, S., Ghosh, P., & Taylor, K. (2016). Household Finances and Social Interaction: Bayesian Analysis of Household Panel Data. *Review of Income and Wealth, 62*(3), 467–488. https://doi.org/10.1111/roiw.12174.

Brüggen, E. C., Hogreve, J., Holmlund, M., Kabadayi, S., & Löfgren, M. (2017). Financial Well-Being: A Conceptualization and Research Agenda. *Journal of Business Research, 79*, 228–237. https://doi.org/10.1016/j.jbusres.2017.03.013.

Burnsed, K. A., & Bickle, M. C. (2015). Comparison of Us Generational Cohorts' Shopping Mall Behaviors and Desired Features. *International Journal of Sales, Retailing & Marketing, 4*(4), 18–30.

Canaan Messarra, L., Karkoulian, S., & El-Kassar, A-N. (2016). Conflict resolution styles and personality: The moderating effect of generation X and Y in a non-Western context. *International Journal of Productivity and Performance Management, 65*(6), 792–810. https://doi.org/10.1108/IJPPM-01-2016-0014.

Chakraborty, A. (2019). Positive Emotions and Investment Decisions: A Conceptual Exploration. *Management Insight, 15*(1), 12–17.

Cornejo, E., Umaña, B., Guíñez, D., Muñoz-Silva, N., & Mardones-Lagos, C. (2017). Endeudamiento y Educación Financiera del Adulto Joven en Chile. *Revista Academia & Negocios, 3*(2), 1–10. Available at https://ssrn.com/abstract=3093907.

Cramer, R. (2014). Millennials Rising: Coming of Age in the Wake of the Great Recession. *New America*, 11–19.

Cutler, D. N. (2015). Millennials and Finance: The 'Amazon Generation'. *Journal of Financial Service Professionals, 6*(6), 33–39.

de Bassa, C. (2013). Financial Literacy and Financial Behavior among Young Adults: Evidence and Implications. *Numeracy, 6*(2), 1–21. https://doi.org/10.5038/1936-4660.6.2.5.

de Bassa, C., Lusardi, A., 2014. Financial capability among young adults. NEFE Report. Available at https://www.nefe.org/_images/research/GWU-Financial-Capability-Young-Adults/GWU-Financial-Capability-Young-Adults-Final-Report.pdf.

Delaney, L., & Lades, L. K. (2017). Present bias and everyday self-control failures: a day reconstruction study. *Journal of Behavioral Decision Making, 30*(5), 1157–1167. https://doi.org/10.1002/bdm.2031.

Farrell, L., Fry, T. R. L., & Risse, L. (2016). The Significance of Financial Self-Efficacy in Explaining Women's Personal Finance Behavior. *Journal of Economic Psychology, 54*, 85–99. https://doi.org/10.1016/j.joep.2015.07.001.

Financial Industry Regulatory Authority -FINRA-, 2013. Financial Capability in the United States. Report of Findings from the 2012 National Financial Capability Study. Available at https://www.usfinancialcapability.org/downloads/NFCS_2012_Report_Natl_Findings.pdf.

Foster, F. D., Ng, J., & Wee, M. (2015). Presentation Format and Financial Literacy: Accessibility and Assessability of Retirement Savings Statements. *Journal of Consumer Affairs, 49*(3), 519–549. https://doi.org/10.1111/joca.12087.

Friedline, T., & West, S. (2016). Financial Education Is Not Enough: Millennials May Need Financial Capability to Demonstrate Healthier Financial Behaviors. *Journal of Family and Economic Issues, 37*(4), 649–671. https://doi.org/10.1007/s10834-015-9475-y.

Gardner, D., & Macky, K. (2012). Generational Differences: Something Old, Something New. In N. Reilly, M. Sirgy, & C. Gorman (Eds.), *Work and Quality of Life: Ethical Practices in Organizations* (pp. 417–428). Netherlands: Springer. https://doi.org/10.1007/978-94-007-4059-4_22.

Gathergood, J. (2012). Self-Control, Financial Literacy and Consumer Over-Indebtedness. *Journal of Economic Psychology, 33*(3), 590–602. https://doi.org/10.2139/ssrn.1873369.

Gathergood, J., & Weber, J. (2014). Self-Control, Financial Literacy & the Co-Holding Puzzle. *Journal of Economic Behavior & Organization, 107*, 455–469. https://doi.org/10.1016/j.jebo.2014.04.018.

Gutiérrez-Rubí, A. (2016). *Millennials En Latinoamérica: Una Perspectiva Desde Ecuador*. Barcelona: Editorial Ariel, S.A.

Heaney, J. G. (2007). Generations X and Y's internet banking usage in Australia. *Journal of Financial Services Marketing, 11*(3), 196–210. https://doi.org/10.1057/palgrave.fsm.4760052.

Hill, L. A. (2008). Where Will We Find Tomorrow's Leaders? *Harvard Business Review, 86*(1), 123–138. http://www.ncbi.nlm.nih.gov/pubmed/18271324.

Hira, T. K., Rock, W. L., & Loibl, C. (2009). Determinants of Retirement Planning Behavior and Differences by Age. *International Journal of Consumer Studies, 33*(3), 293–301. https://doi.org/10.1111/j.1470-6431.2009.00742.x.

Inseng, D. H., & Teichert, T. (2016). The Impact of Generation Y Money Attitudes on Compulsive Buying: Contingency Effects of Childhood Family Resources and Gender. In *2016 Global Marketing Conference at Hong Kong* (pp. 69–79).

Kelly, P., & Datta, S. (2015). *Generation Lost: Engaging Millennials with Retirement Saving*. New York: Bank of New York Mellon. Available at https://www.bnymellon.com/latam/es/_locale-assets/pdf/nuestro-pensamiento/generation-lost.pdf.

Kim, K. T., Anderson, S. G., & Seay, M. C. (2019). Financial Knowledge and Short-Term and Long-Term Financial Behaviors of Millennials in the United States. *Journal of Family and Economic Issues, 40*(2), 194–208. https://doi.org/10.1007/s10834-018-9595-2.

Kimball, M.S., Shumway, T., 2009. Fatalism, Locus of Control and Retirement Saving. Available at https://conference.nber.org/conferences/2009/SI2009/SAV/Kimball.pdf.

Lades, L. K., & Hofmann, W. (2019). Temptation, self-control, and inter-temporal choice. *Journal of Bioeconomics, 21*(1), 47–70. https://doi.org/10.1007/s10818-019-09284-2.

Lantos, G. P. (2014). Marketing to Millennials: Reach the Largest and Most Influential Generation of Consumers Ever. *Journal of Consumer Marketing, 31*(5), 401–403. https://doi.org/10.1108/jcm-03-2014-0909.

Lee, J. M., Lee, Y. G., & Kim, S. (2019). Loan Type and Debt Delinquency among Millennial and Non-Millennial Households. *Family and Consumer Sciences Research Journal, 47*(4), 342–358. https://doi.org/10.1111/fcsr.12315.

Levenson, A. R. (2010). Millennials and the World of Work: An Economist's Perspective. *Journal of Business and Psychology, 25*(2), 257–264. https://doi.org/10.1007/s10869-010-9170-9.

Lim, H. N., Heckman, S., Montalto, C. P., & Letkiewicz, J. (2014). Financial Stress, Self-Efficacy, and Financial Help-Seeking Behavior of College Students. *Journal of Financial Counseling and Planning, 25*(2), 149–160.

Lissitsa, S., & Kol, O. (2016). Generation X vs. Generation Y–A decade of online shopping. *Journal of Retailing and Consumer Services, 31*, 304–312.

Liu, F., Yilmazer, T., Loibl, C., & Montalto, C. (2019). Professional Financial Advice, Self-control and Saving Behavior. *International Journal of Consumer Studies, 4*(1), 23–34. https://doi.org/10.1111/ijcs.12480.

Lobera, J., & Rubio, R. (2015). *Nativos Digitales: ¿hacia Una Nueva Participación Política?, 108* pp. 145–160). Revista de Estudios de Juventud.

Long, J. S., & Freese, J. (2014). *Regression Models for Categorical Dependent Variables Using Stata*. College Station, US: Stata Press.

Lövgren, A., & Magnusson, M. (2016). *Exploring How to Engage Swedish Millennials with Pension Planning. Master Thesis*. Available at http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A947275&dswid=4774.

Lown, J. M., Kim, J., Gutter, M. S., & Hunt, A. T. (2015). Self-Efficacy and Savings Among Middle and Low Income Households. *Journal of Family and Economic Issues, 36*(4), 491–502. https://doi.org/10.1007/s10834-014-9419-y.

Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: An overview. *Journal of Pension Economics and Finance, 10*(4), 497–508. https://doi.org/10.1017/S1474747211000448.

Lusardi, A., Mitchell, O. S., & Curto, V. (2010). Financial Literacy among the Young. *Journal of Consumer Affairs, 44*(2), 358–380. https://doi.org/10.1111/j.1745-6606.2010.01173.x.

Lusardi, A., & Oggero, N. (2017). *Millennials and financial literacy: a global perspective*. Global Financial Literacy Excellence Center. May. Available at https://gflec.org/wp-content/uploads/2017/07/Millennials-and-Financial-Literacy-Research-Paper.pdf.

McLendon, T. (2016). *The Millennial Investor: Mutual Funds versus Exchange Traded Funds*. Bachelor Thesis. Available at.

Miotto, A. P. S. C., & Parente, J. (2015). Antecedents and Consequences of Household Financial Management in Brazilian Lower-Middle-Class. *Revista de Administração de Empresas, 55*(1), 50–64. https://doi.org/10.1590/S0034-759020150106.

Moreno-Herrero, D., Salas-Velasco, M., & Sánchez-Campillo, J. (2017). Individual Pension Plans in Spain: How Expected Change in Future Income and Liquidity

Constraints Shape the Behavior of Households. *Journal of Family and Economic Issues, 38*(4), 596–613. https://doi.org/10.1007/s10834-017-9526-7.

Mottola, G. R. (2014). The Financial Capability of Young Adults—a Generational View. *Insights: Financial Capability—March*. Washington, DC: FINRA.

Nancy, J. (2016). *European Youth in 2016. Special Eurobarometer of the European Parliament*. European Parliament Research Service: Public Opinion Monitoring Unit. https://doi.org/10.2861/837451.

Nava, M., Karp, N., & Nash-Stacey, B. (2014). The Millennials Paradox. *BBVA Research*. Available at https://www.bbvaresearch.com/wp-content/uploads/2014/12/141216_US_BW_BankMillennials.pdf.

Ningsih, R. S., Widiyanto, W., & Sudarma, K. (2018). The Effect of Family Environment and School Environment Towards Savings Behavior Through Self Control in High School Students in Purwodadi City, Grobogan Regency. *Journal of Economic Education, 7*(1), 52–59. https://doi.org/10.15294/jeec.v7i1.25105.

Oliva, A., Antolín-Suárez, L., & Rodríguez-Meirinhos, A. (2019). Uncovering the Link between Self-Control, Age, and Psychological Maladjustment among Spanish Adolescents and Young Adults. *Psychosocial Intervention, 28*(1), 49–55. https://doi.org/10.5093/pi2019a1.

Perry, V. G. (2011). Charging Ahead: An Exploratory Study of Financial Decision-Making among Millennial Consumers. In D. Lamdin (Ed.), *Consumer Knowledge and Financial Decisions* (pp. 129–144). New York: Springer. https://doi.org/10.1007/978-1-4614-0475-0_9.

Rachma, E. A. (2019). The Effect of Self Control and Financial Literation for Student's Saving Behavior. *Jurnal Pendidikan Ekonomi, 4*(1), 26–34. https://doi.org/10.29100/jupeko.v4i1.1043.

Reisenwitz, T. H., & Iyer, R. (2009). Differences in Generation X and Generation Y: Implications for the Organization and Marketers. *Marketing Management Journal, 19*(2), 91–103. http://www.mmaglobal.org/publications/MMJ/MMJ-Issues/2009-Fall/MMJ-2009-Fall-Vol19-Issue2-Complete.pdf#page=112.

Romer, D., Duckworth, A. L., Sznitman, S., & Park, S. (2010). Can Adolescents Learn Self-Control? Delay of Gratification in the Development of Control over Risk Taking. *Prevention Science, 11*(3), 319–330. https://doi.org/10.1007/s11121-010-0171-8.

Rubin, B. A. (2014). Employment Insecurity and the Frayed American Dream. *Sociology Compass, 8*(9), 1083–1099. https://doi.org/10.1111/soc4.12200.

Schewe, C. D., Debevec, K., Madden, T. J., Diamond, W. D., Parment, A., & Murphy, A. (2013). 'If You've Seen One, You've Seen Them All!' Are Young Millennials the Same Worldwide? *Journal of International Consumer Marketing, 25*(1), 3–15. https://doi.org/10.1080/08961530.2013.751791.

Seppanen, S., Gualtieri, W., 2012. The Millennial Generation Research Review. Available at https://www.uschamberfoundation.org/sites/default/files/article/foundation/MillennialGeneration.pdf.

Shahrabani, S. (2012). The effect of financial literacy and emotions on intent to control personal budget: A study among Israeli college students. *International Journal of Economics and Finance, 4*(9), 156–163. https://doi.org/10.5539/ijef.v4n9p156.

Shahrabani, S. (2013). Financial literacy among Israeli college students. *Journal of College Student Development, 54*(4), 439–446. https://doi.org/10.1353/csd.2013.0063.

Shefrin, H. M., & Thaler, R. H. (1988). The Behavioral Life-Cycle Hypothesis. *Economic Inquiry, 26*(4), 609–643. https://doi.org/10.1111/j.1465-7295.1988.tb01520.x.

Sotiropoulos, V., & d'Astous, A. (2013). Attitudinal, Self-Efficacy, and Social Norms Determinants of Young Consumers' Propensity to Overspend on Credit Cards. *Journal of Consumer Policy, 36*(2), 179–196. https://doi.org/10.1007/s10603-013-9223-3.

Strömbäck, C., Lind, T., Skagerlund, K., Västfjäll, D., & Tinghög, G. (2017). Does Self-Control Predict Financial Behavior and Financial Well-Being? *Journal of Behavioral and Experimental Finance, 14*, 30–38. https://doi.org/10.1016/j.jbef.2017.04.002.

Sweeney, R., 2006. Millennial Behaviors and Demographics. Available at http://unbtls.ca/teachingtips/pdfs/sew/Millennial-Behaviors.pdf.

Tulgan, B., & Martin, C. (2001). *Managing Generation Y: Global Citizens Born in the Late Seventies and Early Eighties*. Amherst, MA: HRD Press, Inc.

Wang, L., Lu, W., & Malhotra, N. K. (2011). Demographics, Attitude, Personality and Credit Card Features Correlate with Credit Card Debt: A View from China. *Journal of Economic Psychology, 32*(1), 179–193. https://doi.org/10.1016/j.joep.2010.11.006.

Webley, P., & Nyhus, E. K. (2001). Life-Cycle and Dispositional Routes into Problem Debt. *British Journal of Psychology, 92*(3), 423–446. https://doi.org/10.1348/000712601162275.

Yang, T. Y., & DeVaney, S. A. (2012). Determinants of Retirement Assets and the Amount in Stock in Retirement Assets. *Family and Consumer Sciences Research Journal, 41*(1), 36–55. https://doi.org/10.1111/j.1552-3934.2012.02127.x.

Yao, R., & Cheng, G. (2017). Millennials' Retirement Saving Behavior: Account Ownership and Balance. *Family and Consumer Sciences Research Journal, 46*(2), 110–128. https://doi.org/10.1111/fcsr.12241.