

**FINANCIAL SERVICES REVIEW**

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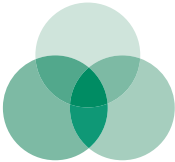
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# FINANCIAL SERVICES REVIEW

The Journal of  
Individual Financial Management

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# Financial Services Review

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## From the Editor

This issue contains **Volume 29 - Issue 2** of *Financial Services Review (FSR)*. I would like to thank the board and members of the Academy of Financial Services for their continued support. I continue to work in broadening the scope of articles, while still focusing on individual financial management and personal financial planning. I encourage authors to reach out when discussing implications of their findings in a more comprehensive way. As such, all articles in the Journal more appropriately relate to financial planning issues.

The lead article “Encouraging Living Will Completion Using Social Norms and Family Benefit” is coauthored by Reem Hussein and Russell N. James III, both at Texas Tech University. Advance directives, such as a living will, can help families control their medical treatments and, in some cases, appropriately limit end-of-life medical expenses. However, usage of such documents remains relatively low. Applying concepts from Terror Management Theory, this study randomly assigned 1,771 online participants to living will descriptions referencing social norms, family benefit, both, or neither. References to family benefit alone significantly increased intentions to complete documents among men, but non-significantly decreased intentions among women insignificantly decreased intentions among women. References to social norms alone modestly increased intentions for both groups. Combining references to both family benefit and social norms generated the largest increase.

The second article “Who demands which type of life insurance? Various factors in life insurance ownership” is coauthored by Wookjae Heo at South Dakota State University, Jae Min at Minnesota State University, and Lee Narang Park at Texas State University. The authors examine factors related to the ownership of life insurance by focusing on the role of the psychological characteristics of the respondents. Using a recent online consumer survey, logistic regression analyses were utilized based on four groups: (a) not having any term life insurance or cash value life insurance; (b) having term life insurance policy only; (c) having cash value life insurance policy only; and (d) having both term life insurance policy and cash value life insurance policy. They found that all of the financial status and psychological characteristics were significant and the specific effects of the characteristics differ by types of ownership. The ownership of term value life insurance was better explained by financial and psychological characteristics, whereas demographic characteristics factored more in the ownership of cash value life insurance.

The third article, “Focusing on Both Sides of the Balance Sheet: The Potential Benefit of Liability Management,” is coauthored by Zhikun Liu at Empower Retirement and David M. Blanchett at Morningstar Investment Management. Debt has become a significant issue

among U.S. households with average household interest payments on liabilities exceeding expected returns on investment assets by more than 50%. In this study, we explore the role of U.S. household debt and analyze the impact of different economic, demographic, and behavioral factors on household borrowing decisions, with a particular focus on “good” and “bad” debts, which depend on type and interest rate. The authors estimate significant potential benefits with improved liability management and find that households with lower asset, income, and education levels are likely to benefit most from assistance with debt optimization.

The final article, “Mobile Bank Applications: Loyalty of Young Bank Customers” is coauthored by Mustafa Nourallah, Christer Strandberg, and Peter Öhman, all at Mid Sweden University. The authors investigate how young bank customers (YBCs) perceive the relationships between several antecedents (i.e. usability, responsiveness, customer satisfaction, and reliability) and loyalty in the context of mobile bank applications (MBAs). They sent an electronic questionnaire to 500 YBCs in Sweden, 146 of whom completed it. Confirmatory factor analysis was used to test the measurement model, and structural equation modeling was used to test the hypotheses. The results indicate that usability is indirectly related to loyalty through responsiveness and customer satisfaction.

Thank you to those who make the journal possible, especially the referees and contributing authors. Over the past year, the following reviewers provided excellent reviews of the articles you enjoyed within the pages of *Financial Services Review*. I would like to send a special thank you to the many reviewers that have significantly contributed to the quality of our journal by providing timely and thorough reviews of the submissions to our journal.

Please consider submission to the *Financial Services Review* and rely on the style information provided to ease readability and streamline the review process. The Journal welcomes articles over the range of areas that comprise personal financial planning. While FSR articles are certainly diverse in terms of topic, data, and method, they are focused in terms of motivation. FSR exists to produce research that addresses issues that matter to individuals. I remain committed to the goal of making *Financial Services Review* the best academic journal in individual financial management and personal financial planning.

Best regards,  
Stuart Michelson  
Editor *Financial Services Review*



# Encouraging living will completion using social norms and family benefit

Reem Hussein<sup>a</sup>, Russell N. James III<sup>a,\*</sup>

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## Abstract

Advance directives, such as a living will, can help families control their medical treatments and, in some cases, appropriately limit end-of-life medical expenses. However, usage of such documents remains relatively low. Applying concepts from Terror Management Theory, this study randomly assigned 1,771 online participants to living will descriptions referencing social norms, family benefit, both, or neither. References to family benefit alone significantly increased intentions to complete documents among men, but non-significantly decreased intentions among women. References to social norms alone modestly increased intentions for both groups. Combining references to both family benefit and social norms generated the largest increase. © 2021 Academy of Financial Services. All rights reserved.

*JEL classifications:* D1; D14; D15

*Keywords:* Estate planning; Advance directives; Living wills; Terror management theory

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## 1. Introduction

Advance directives include statements of preferences regarding the use of life-sustaining technology (living will) and appointment of another to make health care decisions for them when they cannot (durable power of attorney for healthcare; King, 1996). Estate planning in general is an important part of family financial resource management (Delgadillo, 2014; Kabaci & Cude, 2015) and by allowing individuals to express their wishes regarding their end-of-life health care, a living will document can limit the financial impact of this end-of-life medical care (Nicholas, 2011).

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Despite the benefits of advance directives, completion rates remain low (Salmond & David, 2005). A review of 150 studies published from 2011 to 2016 found that only 37% of U.S. adults had completed any advance directives (Yadav et al., 2017). It is possible that death anxiety and mortality salience play a role in the low completion rates of advance directives. Discussions about death and dying tend to be a taboo topic in the United States (McLaughlin & Braun, 1998; Walter, 1991). Terror Management Theory (TMT) provides a theoretical framework for people's management of death-related thoughts. This study tests the effects of two messages consistent with a TMT approach, social norms and family benefit, both alone and together on intentions to complete a living will advance directive.

## **2. Literature review**

Death anxiety and the desire to avoid death-related topics may be one issue that prevents people from completing their advance directives. Meeker and Jezewski (2005) concluded that the primary reason why people do not complete end-of-life planning is to avoid facing their own mortality. Duke et al. (2007) found that procrastination in completing advance directives related to denial and avoidance.

### *2.1. Theory*

TMT, based on the body of work by cultural anthropologist Ernest Becker (1973), provides a theoretical framework for mortality salient decision making (Greenberg et al., 1997). It suggests that death reminders generate two defenses, a proximal defense of avoidance and a distal defense of pursuit of symbolic immortality (Pyszczynski et al., 1999). The pursuit of symbolic immortality is expressed by supporting one's surviving "in-group" and their cultural worldviews (Burke et al., 2010). Both avoidance and support of in-group cultural worldviews aid in managing the fear of death (Greenberg et al., 1997).

As Iverson and Buttigieg (1997, p. 1487), explain, "the 'in-group' is defined as the clique with which the individual identifies." We do not live forever, but our sources of identity, such as "our people" (family members, loved ones, or other in-group members) or our values (i.e., values supported by our identifying in-group) will continue in the world. They will survive us. In experiments, death reminders increase the importance of being positively remembered by this surviving in-group (Greenberg et al., 2010). As such, in-group social norms (a.k.a., herd behavior) will tend to become more powerful in a death salient context (Fritzsche et al., 2010; Gailliot et al., 2008; Maheswaran & Agrawal, 2004) as will leaving a positive impact on surviving loved ones such as family members (Burke et al., 2010; James, 2016a). The following experiments explore the potential practical application of this general theoretical principle to the area of living wills by separately testing a message emphasizing a social norm, a message emphasizing a family benefit, and a message emphasizing both a social norm and a family benefit. James (2016a) presents an economic model predicting similar outcomes. Mortality salience generates responses of avoidance and pursuit of "lasting social impact" simply as the result of utility maximization when such includes expectations

of future circumstances, as suggested by Brunnermeier and Parker (2005), and utility from the circumstances of others, as suggested by Gary Becker (1974). Thus, with both models the two predicted outcomes triggered by a mortality salient condition are the same: avoidance and/or some form of social impact related to one's surviving in-group. This is relevant given the plausibility of experiencing mortality salience when contemplating completion of a living will document.

## *2.2. Avoidance and word choice in experiments*

Previous experiments demonstrate the impact of descriptions using a more or less mortality-salient approach. Results are consistent with the idea that mortality-salient descriptions tend to increase avoidance. Salisbury and Nenkov (2016) found that changing the description of annuity benefits from paying “each year you live” to paying “each year you live until you die” decreased interest in purchasing them. James (2016b) found that in a charitable bequest description, replacing “last will and testament” with “last will and testament that will take effect at your death” significantly decreased interest in making such gifts. In studying preferences for cancer treatments, O'Connor (1989) found that a negative frame presenting the risk of dying reduced interest in more aggressive cancer treatments as compared with a positive frame presenting the chance of survival.

## *2.3. Social impact descriptions in experiments*

Previous research also supports the heightened impact of supporting one's surviving in-group and their cultural worldviews in a mortality salient context. A simple expression of this response is found in an increased desire to comply with social norms following mortality reminders (Gailliot et al., 2008). Fritzsche et al. (2010) showed that in the presence of statements of pro-environmental social norms, mortality salience increased sustainable behaviors. Maheswaran and Agrawal (2004) studied the effects of mortality salience on consumer behavior. They found that “when mortality is salient, people are more willing to act in concert with the opinions of others” (p. 214).

Social norms have proven effective in descriptive word choice experiments related to other end-of-life planning contexts. James (2016b) found that adding a social norm statement (“many people like to leave a gift to charity in their wills”) to the description of a charitable bequest gift significantly increased interest in making the gift. Sanders and Smith (2016) conducted an experiment in which lawyers asked clients during the process of drafting a will if they wanted to leave a gift to charity in their will. They found that highlighting a social norm of charitable giving with the phrase, “Many of our customers like to leave a gift to charity in their will” increased the number and the size of bequest gifts to charity.

Another expression of support for one's surviving in-group is a desire to benefit one's own family. This concern is paramount in estate planning. Previous research studies in charitable bequests indicate that the desire to meet family needs and expectations is the most challenging barrier for such gifts. Interviews with a sample of bequest fundraisers in Australia found that attitudes towards estate planning were overwhelmingly influenced by

expectations of honoring family ties (Baker, 2008). Madden and Scaife (2008) found that even those who included a charitable bequest in their estate plans explained their bequests in terms of family responsibilities. James (2015) found that resolving the conflict between family and charitable bequests by combining a reminder of family connections to a charitable cause with the opportunity to leave a charitable gift in honor of a family member was particularly effective in increasing charitable bequest intentions.

#### *2.4. Applications to medical conversations*

The low level of completed advance directives may relate to the presentation of or conversations around the documents. From a broad perspective, previous research has suggested the need to reconceptualize advance directives as part of a process to communicate and negotiate goals of medical care that satisfy the individual's wishes and values (Morrison et al., 1995; Teno et al., 1997). This may be aided by simple descriptive wording changes.

Other experiments have found significant effects from slight wording changes for descriptions of various types of medical decisions. Malloy et al. (1992) found that how life-sustaining interventions were described influenced whether individuals accepted or rejected the treatments in their advance directives. In a study of word choice in the context of choice of cancer treatments, McNeil et al. (1982) concluded that respondents were more willing to accept the riskier option if the outcomes of treatments were positively framed.

Previous studies test the need to improve and enhance the formulation and implantation of advance directives (Schneiderman et al., 1992; Teno et al., 1997). This study tests the extent to which social norms and/or a reference to family benefit impact the intention to complete the living will advance directive document.

*Hypothesis 1:* A social norms reference will increase intentions to complete a living will advance directive.

*Hypothesis 2:* A family benefit reference will increase intentions to complete a living will advance directive.

#### *2.5. Socio-demographic factors*

Grounded in differing theoretical justifications, several socio-demographic factors, including age, income, race, and gender, have been consistently associated with differences in rates of advance directive completion. The following experimental study includes controls for these factors. In addition, given the documented relevance of these factors for advance directive completion, the analysis also explores how these factors interact with the experimental treatments.

Older age has been associated with higher advance directive completion rates and more openness to end-of-life discussions (Moorman & Inoue, 2013; Pollack et al., 2010). Moorman and Inoue (2013) find that one year of age was associated with a 3% increase in the likelihood of having end-of-life planning documents. Older adults would be more likely than younger adults to be knowledgeable of end-of-life planning as a product of their own life experiences, as well as those of their spouses, and family members (Carr & Khodyakov,

2007). This may be because as people age, they utilize medical services that gives them opportunities to learn about end-of-life planning documents.

Previous research studies have also found that an individual with a higher level of income is more likely to have advance directive documents (Carr, 2012; Moorman & Inoue, 2013). Rosnick and Reynolds (2003) found that people whose incomes were less than \$30,000 were 66% less likely to have a living will than those whose income were \$30,000 or more. Carr (2012) found that people were more likely to complete other end-of-life planning when they drafted a financial last will and testament, which is less likely among individuals with fewer assets.

Previous studies have also found that completion rates of advance directives were consistently higher among Whites than other ethnicities (Alano et al., 2010; Pollack et al., 2010). Hopp and Duffy (2000) found that Whites were significantly more likely to discuss treatment preferences and, as a results, were also more likely to complete advance directives than were African Americans. Others have found that obtaining estate planning documentation may be more of a barrier for African Americans (Lehman & James, 2018).

Several studies have found that being female increases the odds of having written advance care planning (Alano et al. 2010; Bravo et al., 2003). It is possible that gender differences reflect the fact that women are more likely to experience widowhood. Women may also be more likely to talk about their end-of-life treatment preferences with others that may trigger documenting those wishes in advance directives. There are also gender differences in mortality or illness perception. Fletcher and Sarkar (2013) found that among terminal patients, women showed a better understanding that their illness was incurable and was at an advanced stage compared with men.

Previous studies have found that education was positively related to completion rates of advance directives (Alano et al., 2010; Carr & Khodyakov, 2007). Moorman and Inoue (2013) found that individuals with a college degree were more likely to have advance directives than those who have only a high school education. Individuals with lower education levels may not be aware of the importance and availability of end-of-life planning and, in addition, the technical language used in living will documents may be difficult to understand (Hopp & Duffy, 2000).

### **3. Methodology**

#### *3.1. Participants*

Participants for the experiment were recruited using Amazon's Mechanical Turk (MTurk; <https://www.mturk.com>). Participants were recruited with the description "University survey of opinions on health/medical planning" and payment of 75 cents for completing the survey. If participants clicked on the description, they read, "Survey of Health/Medical Opinions. We are conducting an academic survey about opinions on medical planning options and opinions, this takes around 8-10 minutes, and it is intended to advance research about people and their medical planning, so please make sure you can commit the time. At the end of the survey, you will receive a unique 'completion code' to receive credit for taking our survey."

The analysis excluded answers from participants who reported already having completed living will documents. The outcome question about the likelihood of completing a living will document would measure a different behavior (i.e., changing current plans) if the participant already had a living will. Further, the practical issue is understanding how to motivate those who do not yet have planning documents, rather than motivating a revision of existing documents. After excluding participants who already had living will documents, the sample size used in the analysis was 1,771. The study was approved by the Human Subjects Institutional Review Board (IRB2019-862) of the authors' affiliated university.

### 3.2. MTurk and participant attention

Experimental participants in social science research have traditionally been recruited from convenience samples such as nearby college students. Locating experimental participants using MTurk offers several advantages. Participant diversity can be much greater across many measurements including geography, age, cognitive scores, income, and race. Further, some experimental evidence finds that the attentiveness of participants recruited from MTurk exceeds that of student samples. Across three separate studies, Hauser and Schwarz (2016) found, "In all studies, MTurkers were more attentive to the instructions than were college students" (p. 400). Other studies have found responses collected online from participants recruited via MTurk compare favorably with responses collection in-person (Buhrmester et al., 2011; Casler et al., 2013).

There are other online sources for recruiting participants. However, MTurk appears to perform well compared with these other online sources. For example, Kees et al. (2017) found that Qualtrics and Lightspeed panel respondents performed worse on measure reliability tests compared with MTurk respondents. They found, "In comparisons across five samples, results show that the MTurk data outperformed panel data procured from two separate professional marketing research companies across various measures of data quality" (Kees et al., 2017, p. 141).

These advantages have led to the widespread use of MTurk as a source for participant recruitment across the social sciences. (A recent Google Scholar search finds over 40,000 documents referencing this service.) This includes experimental research in financial planning in general (Fulk et al., 2018; Yazdanparas & Alhenawi, 2017) and end-of-life financial planning decisions in particular (James, 2018; James & Routley, 2016).

Participant attention is important in the experiments described below. Participants are randomly assigned to read either control or experimental phrases. Inattention would increase the likelihood that even a highly effective experimental phrase would generate no significant difference between the treatment and control groups (Bates & Lanza, 2013; Mullinix et al., 2015; Paolacci et al., 2010). Thus, to the extent that inattention is a problem in the below experiments, the impact of the experimental phrases would tend to be *understated* in the results.

To address this concern, participants were screened using an attention check task before beginning the study. The following block of text appeared,

You are about to start the research survey, and we appreciate your time and effort. Your honest efforts in this survey could benefit the accuracy of information provided in the financial services



industry. However, it is critically important that you actually take the time to read instructions closely and follow them; if not, our data based on your responses will be invalid. In order to demonstrate that you read instructions, several places in this survey will contain special instructions, such as here. In order to demonstrate that you read instructions, please select the option “no answer” for the next question that asks about how often you take surveys. Then type exactly the following words in the next box, “I read the instructions” in the box labeled “Any comments or questions before we start?” If you do not type the words “I read the instructions” exactly as they appear between the quotations you will not be allowed to complete the survey. Please type this without any quotations or punctuation. Thank you very much.

This was followed by the multiple-choice question, “How often do you take surveys? \_\_ Often \_\_ Sometimes \_\_ Seldom \_\_ Never \_\_ no answer” and an open text box after “Any comments or questions before we start?” Participants who did not answer these questions in the nonstandard way directed by the large block of text, that is, those who skipped the text and just answered the questions quickly, were excluded from participating in the experiment.

### 3.3. Instrument

Respondents answered survey questions online using the Qualtrics platform during October 14–15, 2019. Participants were randomly assigned to one of four groups. Each group read slightly different descriptions of a living will advance directive document and then estimated the likelihood that they would complete such documents in the next 30 days. The four groups are referred to as Base, Base + Family Benefit, Base + Social Norm, and Base + Social Norm + Family Benefit. The four corresponding statements are listed in Table 1.

All statements began with the identical base description of a living will document. A social norm was introduced by adding to the end of the description the sentence, “Many people like to have a living will.” A family benefit was introduced by adding the sentence, “A living will can relieve family members of difficult decisions.” The combination of social norms and family benefit were introduced together by adding the sentence, “Many people like to have a living will because it can relieve family members of difficult decisions.”

Finally, all respondents were asked, “If you were given the opportunity to complete a living will document at no cost to you in the next 30 days, what is the percentage likelihood that you would do so?” Participants answered from 0 to 100 using a horizontal slider bar.

Table 1 Living will phrases

	Text
Base	The living will is a legal document used to address certain future health care decisions only when individuals become incapacitated or unable to make the decisions on their own. The living will is only used at the end of life if a person cannot be cured (terminally ill) or is permanently unconscious.
Base + Family Benefit	A living will can relieve family members of difficult decisions.
Base + Social Norm	Many people like to have a living will.
Base + Social Norm + Family Benefit	Many people like to have a living will because it can relieve family members of difficult decisions

3.4. Control variables

The independent variables for this study include the individual’s age, gender, income, education, and race. Age, education, and income were translated into single variable formats by using reported range midpoints (or the lowest value for the open-ended top range and highest value for the bottom range) to transform grouped data into continuous variables. The age categories were 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, and 85 or older, and were converted to 21, 30, 40, 50, 60, 67, 72, 77, 82, and 85. Income categories were less than \$10,000, and then intervals of \$10,000-\$19,999; \$20,000-\$29,999; \$30,000-\$39,999; \$40,000-\$49,999; \$50,000-\$59,999; \$60,000-\$69,999; \$70,000-\$79,999; \$80,000-\$89,999; \$90,000-\$99,999; \$100,000-\$149,999; and greater than or equal to \$150,000. These income categories were converted to \$10,000; \$15,000; \$25,000; \$35,000; \$45,000; \$55,000; \$65,000; \$75,000; \$85,000; \$95,000, \$125,000; and \$150,000. Education level was converted to the estimated number of years of education. The response to “What is the highest level of education that you have completed?” was converted to nine for “Less than high school,” 12 for “High school,” 13 for “Some college,” 14 for “Associate degree,” 16 for “Bachelors degree,” 18 for “Master degree,” and 20 for “Doctorate degree.”

4. Results

4.1. Descriptive statistics

Table 2 shows the characteristics of the survey participants by their assignment to each living will phrase from Table 1. The average age for participants was 38 years old, 52% were female, and 77% were White. The average years of education for respondents was 14 years and the mean annual income was \$49,000.

The average reported probability that an individual would sign a living will document if given the opportunity to do so at no cost in the next 30 days across the entire sample was 67.8%. The lowest reported probability was for the base group, 65.3%. Adding the family

Table 2 Group means (*N* = 1,771)

Variable	Overall	Base group	Base + Family Benefit group	Base + Social Norms group	Base + Family Benefit + Social Norms group
Likelihood	67.78	65.26	67.72	68.52†	69.68*
Male	0.48	0.47	0.51	0.46	0.50
White	0.77	0.77	0.78	0.77	0.79
Income	49,009	51,008	50,725	46,770	47,477
Education	14.93	15.00	14.99	14.82	14.93
Age	38.20	37.97	38.00	38.36	37.98
<i>n</i>	1,771	456	434	435	446

Note: *t* test comparing each experimental group with base group, †*p* < .10, \**p* < .05.



benefit statement increased this to 67.7%. Adding the social norms statement increased this to 68.5%. Adding both at the same time increased this to 69.7%.

A two-sample *t* test was conducted to measure the statistical significance of these differences in the reported likelihood of completing a living will document. Thus, each group was compared against the base group, where the description included references to neither social norms nor family benefit. The increase in intentions to complete a living will document resulting from addition of the family benefit statement was not statistically significant ( $p = .222$ ). Adding the social norm statement generated a marginally significant increase ( $p = .093$ ). Adding both the social norm and family benefit statements generated a statistically significant increase in the intention to complete a living will document ( $p = .025$ ).

#### 4.2. Regression results

Table 3 reports the coefficients (standard errors in parentheses) from ordinary least square regressions. The outcome variable in the regression is the stated probability of completing a living will document. Column 1 of Table 3 shows results without control variables using the base statement as the reference group. Column 2 of Table 3 shows results with the control variables included. In the controlled regression, the addition of either the social norm statement alone or the combined family benefit and social norm statement significantly increased intentions to complete a living will document. The increase resulting from adding the family benefit statement alone was not statistically significant.

The significant associations with control variables matched the associations found in previous research. (However, this consistency is notable as previous research measured past document completion and this study measured future document completion intentions.) Those who were older, female, or had higher incomes reported a greater likelihood of completing living will documents.

Table 3 Reported likelihood of completing a living will document when adding references to family benefit, social norms, or both (ordinary least squares regression)

Variable	Coefficient	Coefficient
Intercept	65.262*** (1.3756)	53.945*** (5.8270)
Base (reference)		
Base + Family Benefit	2.4615 (1.9698)	2.5215 (1.9126)
Base + Social Norms	3.2553 (1.9573)	3.7641* (1.9005)
Base + Family Benefit + Social Norms	4.4178* (1.9698)	4.6290** (1.9131)
Male		−10.6302*** (1.3652)
White		1.5320 (1.6421)
Income		0.00012*** (0.00002)
Education		0.1150 (0.3534)
Age		0.1896*** (0.00595)

Note: Standard errors in parentheses;  $n = 1,771$ .

\*\*\*, \*\*, and \* indicate statistical significance at  $p < .001$ ,  $p < .01$ , and  $p < .05$  levels, respectively.

Table 4  
Reported likelihood of completing living will document with interaction between gender and references to family benefit, social norms, or both (ordinary least squares regression)

Variable	Coefficient
Intercept	55.4383*** (5.947)
Base (reference)	
Base + Family Benefit	–1.2525 (2.6804)
Base + Social Norms	4.2404 (2.650)
Base + Family Benefit + Social Norms	3.1312 (2.6213)
Male	–13.040*** (2.678)
White	1.4128 (1.6463)
Income	0.00012*** (0.0000)
Education	0.1061 (0.3534)
Age	0.18962*** (0.0595)
Male × Family Benefit	7.60389** (3.8281)
Male × Social Norms	–0.8689 (3.8132)
Male × Family Benefit + Social Norms	3.1551 (3.8294)

Note: Standard errors in parentheses;  $n = 1,771$ .

\*\*\*, \*\*, and \* indicate statistical significance at  $p < .001$ ,  $p < .01$ , and  $p < .05$  levels, respectively.

Although these messages had positive effects on intentions to complete living will documents, it is possible that some messages worked better for some socio-demographic groups than for others. To formally test for this, additional regressions were run including interaction variables between the intervention group and each control variable. No interactions were significant except for gender. In particular, as reported in Table 4, the addition of family benefit statement alone had a significantly ( $p < .01$ ) greater positive impact for men than for women.

To further explore this relationship, Table 5 reports the results of the controlled regression when the sample was restricted either to men only or women only. This shows that the addition of the family benefit statement alone significantly increased intentions to complete a living will document for men, but non-significantly decreased intentions to complete a living will document for women. Following this same pattern, the coefficient for the combined family benefit and social norms statement was larger than for the social norms statement alone among men (6.23 vs. 3.34) but was smaller among women (3.00 vs. 4.09).

## 5. Implications

A living will advance directive can be an important part of end-of-life planning. However, usage of such documents is relatively low. This study tested the effects of different messages on intentions to complete a living will advance directive. Completing such documents involves explicitly planning for one's own end of life. Past theoretical work suggested that mortality salience is likely to trigger responses of avoidance and pursuit of lasting social impact (a.k.a., symbolic immortality) through support of one's surviving in-group. This second effect can be expressed by increased interest in complying with group norms and benefitting surviving family members. Matching with successful interventions in other

Table 5  
Reported likelihood of completing living will document for male only or female one (ordinary least squares regression)

Variable	Male respondents only	Female respondents only
Intercept	35.932*** (8.4710)	62.848*** (7.8822)
Base (reference)		
Base + Family Benefit	6.2123* (2.8521)	−1.3153 (2.5664)
Base + Social Norms	3.3366 (2.8598)	4.0912 (2.5431)
Base + Family Benefit + Social Norms	6.2281* (2.9171)	3.0018 (2.5118)
White	0.2114 (2.4560)	2.522 (2.2061)
Income	0.0001*** (0.0000)	0.00011*** (0.0000)
Education	0.3258 (0.5352)	−0.16991 (0.4687)
Age	0.2932*** (0.0918)	0.09493 (0.0776)
<i>n</i>	858	913

Note: Standard errors in parentheses.

\*\*\*, \*\*, and \* indicate statistical significance at  $p < .001$ ,  $p < .01$ , and  $p < .05$  levels, respectively.

mortality salient contexts, the current study tested the effects of referencing social norms, family benefit, or both combined.

References to social norms alone modestly increased intentions to complete living will documents. Combining both social norms and family benefit references significantly increased intentions. Referencing family benefit alone significantly *increased* intentions to complete documents among men, but non-significantly *decreased* intentions among women (i.e., the decreased intentions among women were not statistically significant).

Even though both the social norms and family benefit messages fit with the theoretical prediction of a desire to support one's in-group and their values, the differences in results suggests that these two references may work through distinct mechanisms. This also fits with the overall result that the most effective approach was to combine both messages. The suggestion to combine both messages also matches an experimental result from charitable bequest decision-making. In that experiment, a family benefit message referenced both family connections with a charitable cause and provided an opportunity for a memorial or tribute bequest (James, 2015). Both this family benefit intervention and a social norm intervention increased interest in charitable bequests, but the greatest impact came from using both messages together (James, 2015).

### 5.1. Limitations and future research

These results provide a first exploration of the use of these phrasing interventions to encourage living will document completion, but they are subject to various limitations such as an online sample and a hypothetical context. Findings resulting from a non-probability crowdsourcing sample lack formal statistical generalizability and thus cannot be used to estimate national population means. Participant inattention to the wording differences would lead to an understatement of the impact of the phrasing differences reported here. Placing the benefit description interventions at the end of, rather than the beginning of, the lengthy

living will description statement may also have led to a muted difference in responses across the groups (James, 2018).

A post hoc analysis also found a significant gender interaction with the family benefit message. Although not predicted a priori, this difference may warrant future exploration. The post hoc exploration of gender interactions, while potentially instructive for future research, is subject to multiple comparison limitations as it was part of an exploratory examination of five control variables (gender, race, income, age, and education). Finally, future studies may consider using different sources for participant recruitment to see if these results replicate with alternative samples and the inclusion of additional demographic variables.

## 6. Conclusion

Although subject to various limitations, these results are important for both theoretical and practical reasons. They provide the first experimental evidence on the effect of different messages on the estimated likelihood of completing living will advance directives. They are important practically not only by showing that the combination of social norms and family benefit messages can be, overall, beneficial, but because they show that the family benefit message was particularly powerful for men. Additionally, they provide evidence that the insights gleaned from work completed with other forms of end-of-planning may also apply to advance directives. This suggests the promise of cross-disciplinary research to provide understanding across end-of-life decisions whether related to healthcare, life insurance, annuities, or estate planning (James, 2016a).

Advanced planning can ensure that patients' preferences for medical treatment is followed; thus, accomplishing both personal and family financial goals. However, achieving this often requires memorialization in a written document. Therefore, understanding how to encourage the documentation of such preferences can be an important step to achieving important life, health, and financial outcomes.

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# Who demands which type of life insurance? various factors in life insurance ownership

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## Abstract

This study examined factors related to the ownership of life insurance by focusing on the role of the psychological characteristics of the respondents. Using a recent online consumer survey, logistic regression analyses were utilized based on four groups: (a) not having any term life insurance or cash value life insurance; (b) having term life insurance policy only; (c) having cash value life insurance policy only; and (d) having both term life insurance policy and cash value life insurance policy. We found that all of the financial status and psychological characteristics were significant, while some of the demographic characteristics were not significant. The specific effects of the characteristics differ by types of ownership. The ownership of term value life insurance was better explained by financial and psychological characteristics, whereas demographic characteristics factored more in the ownership of cash value life insurance. Discussion and implications are provided. © 2021 Academy of Financial Services. All rights reserved.

**Keywords:** Life insurance; Term life insurance; Cash value life insurance; Psychological characteristics

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## 1. Introduction: The need to understand the demand for life insurance

Life insurance is primarily designed to protect the insured against the possibility of losing an income stream, such as the premature death of the family breadwinner, which is the purpose of all types of life insurance (Thoyts, 2010). Term life insurance is specifically

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designed to provide a death benefit with a relatively cheaper insurance premium (Gitman, Joehnk, & Billingsley, 2014). On the contrary, cash value life insurance charges a higher premium to provide a savings element in addition to a death benefit; this savings element is called the “cash value” element (Rejda & McNamara, 2016).

The main differences between term life insurance and cash value life insurance, as well as suggestions for consumers, can be discussed with a financial planner. Whereas term life insurance has the sole purpose of protecting lost income, cash value life insurance is more likely to be the product of financial planning. For example, cash value life insurance can have a strategic financial planning purpose, with tax-deferred savings on estates, income, and bequests (Clark, 2010; Cymbal, 2013; Kait, 2012; Whitelaw, 2014). In addition, cash value life insurance can be a financial option for retirement savings (Tannahill, 2012) and investment tools (Cordell & Landgon, 2013). Therefore, many strategies in financial planning can be related to the purchase of cash value life insurance (Grable, 2016).

Theoretically, the choice between term life insurance and cash value life insurance depends on consumers’ specific financial needs and situations (Gitman et al., 2014; Grable, 2016). However, the decision regarding which life insurance policy is the best option is still in question for many individual consumers. Although roughly three types of life insurance can be discussed and evaluated—term life insurance, cash value life insurance, and group life insurance—the focus of such an argument made by practitioners is often placed on the first two types of life insurance, considering the fact that group life insurance provided by employers often comes without multiple options for individual purchases (Rejda & McNamara, 2016). Although this question is repeatedly asked by numerous individual consumers, it is debatable even among financial practitioners as to who actually needs term life insurance versus cash value life insurance.

The question is unlikely to be answered when factors come into play beyond classical demographic and functional characteristics and expected demand, accordingly. The functional characteristics of life insurance purchases, such as maintaining or improving financial security, as well as the psychological characteristics of such purchases, including feelings of comfort and recognition, can lead to these purchases being made (Grable & Goetz, 2017). Song, Park, Park, and Heo (2019) also emphasized that the consumer’s personal experience (i.e., death of a family member) can spark a life insurance purchase, in addition to his or her financial circumstances. If a financial planner leans only on the functional characteristics of the purchases, there may arise communication conflicts between the financial planner and the consumer, meaning that the consumer’s needs will ultimately not be fulfilled (Grable & Goetz, 2017). Therefore, it is important to better estimate the effect of consumers’ psychological characteristics on demand for life insurance purchases to increase the accuracy of the suggestions and relevance to consumers’ different life situations.

Therefore, the primary goal of this study is to analyze the role of psychographic factors in the ownership of life insurance through the use of an online consumer survey. Specifically, to investigate how these various factors are related to the ownership of life insurance, this study distinguished the type of ownership into four categories: (a) none of either term life insurance or cash value life insurance; (b) term life insurance only; (c) cash value life insurance only; and (d) both types of life insurance. In this study, three aspects of explanatory factors of life insurance ownership were assessed: financial status characteristics,

psychological characteristics, and demographic characteristics. Financial status characteristics include household net balance, the ownership of emergency funds, financial risk tolerance, and subjective financial knowledge. Psychological characteristics include locus of control, financial satisfaction, financial self-efficacy, and life satisfaction. Demographic characteristics include the gender of the respondent, household income level, the working status of the respondent, the number of children in the household, education level, age, race, and the marital status of the respondent, as well as the perceived health condition of the respondent. The findings of this study, based on psychographics that include a combination of demographic factors and psychological factors (Heo, 2020), can provide an empirical understanding of their effects on the ownership of life insurance by type. Through this study's analysis of the psychographic factors' associations with life insurance, it is expected that financial practitioners and researchers will be able to better accommodate and identify various consumer needs for the ownership of life insurance.

The research questions in this study are as follows: In what ways are financial status characteristics, psychological characteristics, and demographic characteristics associated with life insurance ownership by type of life insurance? Understanding the associations between various factors and life insurance ownership, as well as the ways in which the associations differ across the subsamples by type of life insurance, will provide financial professionals with important insights when they offer financial counseling and planning services in the future.

## 2. Literature review

### 2.1. *Different needs of life insurance by types*

There should be different levels of consumer demand, pure protection, or an additional investment purpose. Term life insurance is well-known for its pure protection purpose, whereas cash value life insurance can offer an additional saving purpose beyond the pure protection of the lost income of the insured (Gitman et al., 2014; Grable, 2016; Rejda & McNamara, 2016). Thus, there can be conceptual and empirical differences in understanding influential factors in the demand for life insurance by type.

However, to our knowledge, there has been little empirical and conceptual research distinguishing the different demand for life insurance by type and applying psychological characteristics to an empirical analysis for financial practitioners. Based on studies from a conventional perspective with regards to life insurance, life insurance has been considered to be a substitute for future savings or a potential income source of the deceased (Li, Moshirian, Nguyen, & Wee, 2007). Many studies based on this perspective in the current literature have identified factors related to life insurance purchases regardless of type. Predictors of the demand for overall life insurance ownership or purchase primarily include three areas (Anderson, & Nevin, 1975; Heo & Grable, 2017; Liebenberg, Carson, & Dumm, 2012; Zietz, 2003): (a) socio-demographic characteristics; (b) financial characteristics; and (c) psycho-behavioral characteristics.

Other studies (e.g., Heo, Grable, & Chatterjee, 2013) have discussed the idea that cash value life insurance should be analyzed differently from term life insurance because it can function as a complement to savings. Heo et al. (2013) suggested that it is important to

further discuss practical considerations for financial services when financial planners and advisors provide suggestions to clients. Thus, placing a greater emphasis on the distinction of life insurance ownership by type can extend the current discussion of the literature and add more empirical evidence to existing body of knowledge.

## *2.2. Determinants generally known for term life insurance*

Term life insurance policies provide insurance coverage for limited periods of time at fixed payment rates. The policies only pay death benefits to the beneficiaries if the person insured dies within the time period. After that period, term life policies do not provide any additional benefits to the insured, and the policies must be renewed with different payments or conditions if coverage is desired for another time period (Brown & Goolsbee, 2002). This is why term life insurance policies are often described as pure protection and can act as car or homeowner's insurance (Garman & Forgue, 2018).

Although extensive studies in the current literature have examined the determinants of life insurance purchasing without distinguishing between type, some studies have found that the ownership of term life insurance is related to various household characteristics. Anderson and Nevin (1975) found that young married couples were more likely to purchase term life insurance when they had greater net worth, the spouse already had life insurance before marriage, and there was no influence of an insurance agent on the life insurance decision. Goldsmith (1983) also examined the demand for term life insurance by focusing on the human capital of spouses in married-couple households. He found that the spouse's higher educational level and the spouse's employment status (e.g., the spouse's participation in the labor force) decreased the spouse's likelihood to purchase term life insurance. The spouse's existing insurance coverage exceeding the sample mean, a greater household asset level, and larger household size were also negatively associated with the spouse's likelihood to purchase life insurance. However, a greater household income level increased the likelihood of the insurance purchase.

Liebenberg et al. (2012) used the 1983–1989 Survey of Consumer Finances (SCF) panel dataset to investigate the determinants of the demand for a new life insurance policy, as well as a change in life insurance policy. They found that households whose statuses changed over the two periods (i.e., 1983 and 1989)—including having new children, experiencing relatively high levels of income growth, and launching new jobs—were more likely to purchase new term life insurance policies in the next period if they had new children. In addition, a large increase in income and a net worth increase were also related to the larger face value of the term life insurance purchased.

## *2.3. Determinants generally known for cash value life insurance*

Cash value life insurance policies (also known as whole life or permanent life policies) are not term-dependent (Brown & Goolsbee, 2002). These policies provide insurance over the lifetime of the policyholder and pay a death benefit upon the death of the insured. Cash value insurance life policies also provide a savings element that is invested separately under the policy and builds up over time, either at a fixed rate or at a variable rate (Garman &

Forgue, 2018). The cash value element can pay a living benefit to the policyholders before the death of the insured, and policyholders can borrow against the accumulated cash value and pay policy premiums using cash value. Cash value life insurance policies typically charge higher premiums and come with less homogenous options because they come with a greater variety of options and plans (e.g., premium payment, borrowing, rate of return, investment types, fees, and charges) than term life insurance does (Brown & Goolsbee, 2002).

Few studies have empirically examined the effects of household characteristics on the ownership of cash value life insurance. Mulholland, Finke, and Huston (2016) examined the determinants of ownership of cash value life insurance using the SCF dataset, but despite changes in the effects of the determinants across different survey years, they found that the following were more consistently related to the likelihood of the ownership of cash value life insurance: net worth, educational level, whether or not the insured was married, having retirement saving plans (e.g., IRA/Roth, DC, or DB plans), having a child, and financial sophistication. Meanwhile, younger age and ownership of term life insurance were negatively related to the likelihood of owning cash value life insurance.

Liebenberg et al. (2012) found that changes in the statuses of households over the two periods, such as newly married couples' households experiencing relatively high income growth, were more likely to have new whole life insurance policies. Meanwhile, new employment, growth in income, and amount of term life insurance dropped were each positively related to the amount of new cash value life insurance.

Using data from the National Longitudinal Survey of Youth 1979 (NLSY79), Song et al. (2019) examined the changes in life insurance ownership during the two waves of the survey (i.e., 2008 and 2012). The researchers found that the respondents with increases in savings, as well as those who had experienced the recent deaths of family members, were more likely to purchase cash value life insurance policies.

#### *2.4. Risk tolerance, financial knowledge, and perceived health condition*

Risk attitude has attracted significant attention from researchers as a determinant of life insurance demands, and it is conceptualized by various terms, including risk tolerance, risk aversion, risk preference, and risk-taking, depending on the definitions presented in the studies. However, no matter which term is used, risk attitude has been found to be closely associated with life insurance ownership (Outreville, 2014). However, the effect of risk attitude has shown mixed results. For example, some researchers have found that consumers with less risk tolerance were likely to buy life insurance in their asset allocation (Chen, Ibbotson, Milevsky, & Zhu, 2006; Finke & Huston, 2003). Others found that people with a higher tendency to take risks were likely to purchase life insurance because they sought greater risk exposure (Burnett & Palmer, 1984; Xiao, 1996). Baek and DeVaney (2005) found that an above-average level of risk-taking was positively associated with term life insurance ownership, but it was not associated with cash value life insurance ownership. Song et al. (2019) also discovered that the impact of risk-taking was not significant in purchasing cash value life insurance.

Financial knowledge has been considered to be an important element of financial decision-making. However, there are limited studies that have investigated the impact of

financial knowledge on life insurance demand. Using the sample of adult residents of a single state, Tennyson (2011) assessed the respondents' insurance knowledge about general insurance principles, as well as the features of specific types of insurance policies. Although the level of insurance knowledge was relatively low among the respondents, it was significantly related to their confidence in insurance decision-making.

In life insurance markets, health status and medical history are the basic factors for pricing on term policies. Thus, some researchers believe that subjectively evaluated health status is one of the most important predictors of determining the ownership of life insurance, as well as the choice of the insurance type. For example, Baek and DeVaney (2005) found that excellence in health status was negatively associated with cash value life insurance ownership; however, they did not find any significant influence of perceived health status on term life insurance ownership decisions.

To fill in the gap in the existing literature, this study included risk tolerance, financial knowledge, and perceived health condition as independent variables of consumers' financial status characteristics in determining the purchase of life insurance.

### *2.5. Locus of control, financial satisfaction, financial self-efficacy, and life satisfaction*

Locus of control has been defined as the concept of a person's perceived controllability about a situation, which can be explained with internal or external control of reinforcement (Rotter, 1966). While the external locus of control denotes that any outcomes took place because of external reasons, such as fate and luck, the internal locus of control indicates that lifetime consequences occurred because of a person's own actions (Cobb-Clark et al., 2016). Because the locus of control drives a person to believe that an outcome occurred based on a certain circumstance (i.e., internal or external factors), locus of control is expected to be associated with financial behavior.

Specifically, locus of control was found to be related to personal finance and financial decision-making (e.g., Cobb-Clark et al., 2016; Danes & Rettig, 1993; Nowicki, Ellis, Iles-Caven, Gregory, & Golding, 2018; Perry & Morris, 2005; Prawitz & Cohart, 2016; Tokunaga, 1993). For example, Cobb-Clark et al. (2016) found that internal locus of control was significantly associated with the tendency toward saving, which can be explained by Perry and Morrison's (2005) argument that a person with a higher level of external locus of control tended to have a lower willingness to manage their financial situation. However, the association between locus of control and the ownership of life insurance was rarely found in the existing literature. Therefore, in this study, the association between external locus of control and the ownership of life insurance was explored further.

Financial satisfaction indicates a perceived assessment of one's own financial situation (Hira & Mugenda, 1998; Xiao, Chen, & Chen, 2014; Xiao & O'Neill, 2018). There is no universal consensus on the measurement of financial satisfaction, which has been previously measured using either single or multiple items. For example, some studies used a single measure, such as: "Overall, thinking of your assets, debts, and savings, how satisfied are you with your current personal financial condition?" (e.g., Robb & Woodyard, 2011; Xiao et al., 2014; Xiao & O'Neill, 2018). Others have used multiple items (e.g., Loibl & Hira, 2005; Montalto, Phillips,



McDaniel, & Baker, 2019), including financial situation and the ability to understand and make sound financial decisions.

As an element of general life satisfaction and well-being, a positive relationship between financial behaviors and financial satisfaction has been found (Robb & Woodyard, 2011; Xiao et al., 2014; Xiao & O'Neill, 2018). In particular, Robb and Woodyard (2011) found that a higher financial satisfaction level was associated with more positive financial practices defined by six items including having an emergency fund, high credit report, no overdraft, credit card payoff, having a retirement account, and effective risk management. However, despite extensive studies having been done about financial satisfaction, the existing literature about the association between financial satisfaction and ownership of life insurance is limited.

Self-efficacy refers to an individual's belief in their ability to perform a specific task successfully (Bandura, 1977, 2006). A person with a strong sense of self-efficacy can execute the cognitive and behavioral efforts required to obtain the desired outcome (Bandura, 1977). Thus, the feeling of self-efficacy has been revealed to be one of the major factors influencing human behavior (Ajzen, 2002; Bandura, 1977). Researchers in personal finance have been aware of the importance of financial self-efficacy to improve financial capability (Amatucci & Crawley, 2011; Lown, 2011). Generally defined as "one's sense of being prepared and able to handle financial responsibility" (Montalto, et al., 2019, p. 15), financial self-efficacy has been found to be significantly and positively associated with responsible financial behaviors, including help-seeking, making investments, and saving (Asebedo, & Seay, 2018; Farrell, Fry, & Risse, 2016; Lim, Heckman, Montalto, & Letkiewicz, 2014). Furthermore, financial self-efficacy is linked to financial well-being and subjective well-being (Robb, 2017). Based on previous findings, it is hypothesized that financial self-efficacy can be related to the likelihood of life insurance ownership, which is a type of financial management. To assess one's level of financial self-efficacy, Lown (2011) developed a financial self-efficacy scale (FSES) that measures an individual's self-efficacy specific to certain financial behaviors. Directly modeled on the general self-efficacy scale (GSES), the financial self-efficacy scale consists of six items that ask questions about respondents' confidence in terms of managing their personal finances. Higher scores on the financial self-efficacy scale indicate higher confidence in personal financial management.

Life satisfaction is a cognitive judgment regarding a person's own quality of life (Diener, Emmons, Larsen, & Griffin, 1985). The assessment of quality of life is dependent upon the comparison of one's perceived life circumstances with self-imposed standards (Pavot & Diener, 2009). Thus, one's degree of satisfaction with life is highly up to the individual person (Diener, Emmons et al., 1985; Pavot & Diener, 2009). Researchers have found that life satisfaction is closely related to one's financial status proxied by income, wealth, or financial satisfaction. The major argument was whether or not money could buy happiness. Although researchers have pointed out that the effects of financial factors on life satisfaction were only minimal, studies tended to confirm that there was a positive association between financial status and life satisfaction (Cheung & Lucas, 2015; Diener & Biswas-Diener, 2002; Diener & Diener, 2009; Heo, Lee, & Park, 2020; Johnson & Krueger, 2006; Park, Lee, & Heo, 2020). In other words, individuals who earned a higher income, who had more wealth, and who reported both higher levels of financial satisfaction and lower levels of financial stress were more likely to exhibit higher levels of life satisfaction.

However, the association between financial status and life satisfaction can also be inverse. By reviewing a variety of panel studies, Diener and Biswas-Diener (2002) concluded that the relationship between subjective well-being and financial status is bidirectional, indicating that happy people could be more proactive in managing their finances. Based on this assumption, it is reasonable to think that the subjective perception of life can influence one's decision-making regarding life insurance ownership. If a person is highly satisfied with one's own life, the person would be more likely to have life insurance, either as a means of transferring financial resources or as a savings vehicle. However, if a person is unsatisfied with her/his life, the person might not look beyond the present. Nevertheless, there is a lack of existing literature that examines how an individual's life satisfaction determines his/her decision to buy life insurance.

### 3. Data and methodology

#### 3.1. Data and analyses

This study conducted an online consumer survey of 1,000 respondents across the United States, collected with a random sampling method in September 2019. The questionnaire measured both individual- and household-level characteristics regarding various financial decisions and circumstances, including life insurance type, net balance status, emergency fund ownership, financial risk tolerance, two types of financial knowledge (subjective and objective), perceived health condition, gender, income, working status, number of children in a household, education, age, race, and relationship status. After excluding respondents who did not complete the questions used by this study, the final sample consisted of 997 respondents. The survey was funded by the National Institute of Food and Agriculture (NIFA) as the Hatch Project. The details of the psychographics of the respondents are shown in the next section.

In this study, a four subsample analysis was conducted based on the type of life insurance ownership. Specifically, out of the total sample ( $N = 997$ ), 521 respondents answered that they did not have any term life insurance or cash value life insurance. Among the 476 respondents who had either term or cash value life insurance, 227 respondents reported that they only had term life insurance, whereas 89 respondents reported that they only had cash value life insurance. Lastly, 160 respondents answered that they had both term life insurance and cash value life insurance.

To answer the research question, this study utilized four logistic regression analyses to investigate the marginal effect of each influential factor on the demand for life insurance by type. The dependent variables were binary indicators of whether or not the respondent had a life insurance policy: (a) not having any term life insurance or cash value life insurance; (b) having term life insurance policy only; (c) having cash value life insurance policy only; and (d) having both term life insurance policy and cash value life insurance policy. Thus, the marginal effects of the influential factors were checked against the odds ratio, which was calculated by the probability of “having life insurance” versus “not having life insurance,” so that the odds ratio of each factor in the model denotes the tendency of having life insurance influenced by the factor.

To ensure the robustness of the estimation, a seemingly unrelated estimation method was utilized when executing four logistic regression models. Specifically, seemingly unrelated estimation executed multiple models promptly, considering the covariances and distribution simultaneously (Rogers, 1993; White, 1982). By using Stata 15.0 with a reliable code (i.e., *suest*) for seemingly unrelated estimation (Weesie, 1999), four logistic models were simultaneously executed for the robustness of the model results. In addition, the significance criterion was set as  $\alpha = 10\%$  ( $p < .10$ ) because the sample size of each subsample was relatively small, such as 227, 89, and 160. When the sample size is small, there is a tendency that type II error increases (Banerjee, Chitnis, Jadhiv, Bhawalkar, & Chaudhury, 2009). When  $\alpha$  is strict to 5% ( $p < .05$ ), a small sample size is more likely to produce insignificant results, even though they are significant. Therefore, in this study, the  $\alpha$  level was set at 10% ( $p < .10$ ).

### 3.2. Variables

We used four dependent variables: (a) not having any term life insurance or cash value life insurance; (b) having term life insurance policy only; (c) having cash value life insurance policy only; and (d) having both term life insurance policy and cash value life insurance policy. The dependent variable was measured as a dichotomous variable (yes or no) based on the answer to the question that follows this brief explanation: “The two major types of life insurance are term and cash value policies. Term policies pay a benefit if the insured person dies, but otherwise, they have no value. They are often provided through an employer or union, but they may also be bought by individuals. Cash value policies also pay death benefits, but differ in that they build up value as premiums are paid. Are any of your (or your spouse/partner’s) policies term insurance?” The other dependent variable was measured as a dichotomous variable (yes or no) by the answer to the following question: “Do you (or your spouse/partner) have any policies that build up cash value or that you can borrow on? These are sometimes called ‘whole life,’ ‘straight life,’ or ‘universal life’ policies.” Finally, the answers to all three questions were coded as binary variables: “yes” was coded as 1, and 0 otherwise.

The key independent variables in this study include financial status characteristics, psychological characteristics, and demographic characteristics. As the financial status characteristics, a net balance of respondents’ emergency funds, financial risk tolerance, and subjective financial knowledge were used. The net balance was measured by a categorical variable: zero net balance, negative net balance, and positive net balance. The ownership of an emergency fund was measured as a binary question, and these two financial status factors were coded as binary variables (yes = 1; no = 0). For financial risk tolerance, Grable and Lytton’s 13 items were used (Grable & Lytton, 1999), which were considered to be reliable and valid measurements for financial risk tolerance (Grable, Lyons, & Heo, 2019). Financial risk tolerance ranged from 13 points to 40 points, where the lowest number meant the lowest level of financial risk tolerance. Subjective financial knowledge was measured with a question regarding the self-assessment of one’s own level of financial knowledge, ranging from 1 point (*lowest level*) to 7 points (*highest level*).

The psychological characteristics include four variables: external locus of control, financial satisfaction, financial self-efficacy, and life satisfaction. External locus of control was



measured by using eight items (Perry & Morrison, 2005) that the questionnaires asked to answer with a 5-point scale (1 = *almost never*, 5 = *almost always*), so that the maximum number of summing the eight items (i.e., 40) denotes the highest level of external locus of control. Otherwise, the minimum number of summing the eight items (i.e., 8) indicates the lowest level of external locus of control. Financial satisfaction was measured with seven items from Loibl & Hira (2005), in which a 5-point scale was utilized (1 = *very dissatisfied*, 5 = *very satisfied*). The maximum number of summing these seven items (i.e., 35) denotes the highest level of financial satisfaction, while the minimum number of summing seven items (i.e., 7) indicates the lowest level of financial satisfaction. In terms of financial self-efficacy, six items were utilized from Lown (2011), where a 5-point scale was utilized (1 = *strongly disagree*, 5 = *strongly agree*). The maximum number of summing these six items (i.e., 30) denotes the highest level of financial self-efficacy, while the minimum number of summing six items (i.e., 6) indicates the lowest level of financial self-efficacy. Lastly, life satisfaction utilized five items of satisfaction with a scale derived from Diener, Emmons, Larsen, & Griffin (1985). For life satisfaction, a 7-point scale was utilized (1 = *strongly disagree*, 7 = *strongly agree*). Therefore, the maximum number of summing these five items (i.e., 35) denotes the highest level of life satisfaction, while the minimum number of summing five items (i.e., 5) indicates the lowest level of life satisfaction.

Demographic characteristics consist of both respondent-level and household-level variables. For the respondent-level variables, four variables were measured as binary variables: gender (male = 0, female = 1), working status (not working = 0, working = 1), race/ethnicity (nonwhite = 0, white = 0), and relationship status (not married = 0, married/coupled = 1). The education level of the respondent was measured with a categorical variable: high school graduate or lower, associate degree, bachelor's degree, and graduate-level or higher. The lowest education level (i.e., high school graduate or lower) is used as a reference group in an analytic procedure. The age of the respondent was measured by number of years. Household-level variables include income and the number of children in the household. Income was measured between eight different categories: lower than \$15,000, \$15,000–24,999, \$25,000–34,999, \$35,000–49,999, \$50,000–74,999, \$75,000–99,999, \$100,000–149,999, and greater than \$150,000. The lowest income level (i.e., lower than \$15,000) was used as a reference group. The number of children in the household was measured as a continuous variable. Finally, perceived health condition was the self-assessment of one's perceived health condition, and this was measured as a binary variable (not good = 0, good = 1).

## 4. Findings

### 4.1. Descriptive information of samples

Tables 1 and 2 displayed the descriptive statistics of both the total sample and the subsamples. For example, among the total sample result ( $N = 997$ ), approximately 40% of the respondents had zero net balances or negative net balances, and around 45% of respondents had emergency funds. The income levels of approximately half of the respondents fell

Table 1 Descriptive statistics of samples: Categorical factors

	Total sample ( <i>N</i> = 997)	No insurance ( <i>n</i> = 521)	Term only ( <i>n</i> = 227)	Cash-value only ( <i>n</i> = 89)	Both insurance ( <i>n</i> = 160)
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Financial status characteristics					
Negative NB	263 (26.38)	173 (33.21)	56 (24.67)	9 (10.11)	25 (15.63)
Emer. funds (yes)	453 (45.44)	177 (33.97)	105 (46.26)	61 (68.54)	110 (68.75)
Demographic characteristics					
Gender (= female)	776 (77.83)	423 (81.19)	186 (81.94)	53 (59.55)	114 (71.25)
Income					
Lower than \$15k	113 (11.33)	89 (17.08)	11 (4.85)	7 (7.87)	6 (3.75)
\$15k - \$25k	126 (12.64)	97 (18.62)	8 (3.52)	10 (11.24)	11 (6.88)
\$25k - \$35k	144 (14.44)	87 (16.70)	29 (12.78)	12 (13.48)	16 (10.00)
\$35k - \$50k	157 (15.75)	87 (16.70)	36 (15.86)	16 (17.98)	18 (11.25)
\$50k - \$75k	182 (18.25)	88 (16.89)	50 (22.03)	18 (20.22)	26 (16.25)
\$75k - \$100k	128 (12.84)	39 (7.49)	43 (18.94)	11 (12.36)	35 (21.88)
\$100k - \$150k	105 (10.53)	27 (5.18)	38 (16.74)	13 (14.61)	27 (16.88)
Over \$150k	42 (4.21)	7 (1.34)	12 (5.29)	2 (2.25)	21 (13.13)
Work-status (yes)	657 (65.90)	315 (60.46)	167 (73.57)	44 (49.44)	131 (81.88)
Education					
High school/lower	235 (23.57)	154 (29.56)	37 (16.30)	15 (16.85)	29 (18.13)
Associate degree	303 (30.39)	167 (32.05)	72 (31.72)	29 (32.58)	35 (21.88)
Bachelor degree	321 (32.20)	148 (28.41)	90 (39.65)	26 (29.21)	57 (35.63)
Graduate/higher	138 (13.84)	52 (9.98)	28 (12.33)	19 (21.35)	39 (24.38)
Race/ethnicity					
White	809 (81.14)	414 (79.46)	193 (85.02)	78 (87.64)	124 (77.50)
Relationship status					
Married/coupled	544 (54.46)	227 (43.57)	153 (67.40)	54 (60.67)	111 (69.38)

Note: NB = net balance; Emer. funds = emergency funds.

between \$35,000 and \$99,999, which means that the sample was not highly skewed to high- or low-income respondents, the majority of which were working white females who had completed at least an associate degree. Half of the respondents were either married or living with their partners. The average number of children and the average age of the respondents were less than one and 47 years old, respectively. For the physio-psychological characteristics, the average level of financial risk tolerance, subjective financial knowledge, and objective financial knowledge were measured as 20.67, 3.71, and 1.96, respectively. The levels of financial knowledge were both slightly higher than the median value of each, measuring for example as 3.5 and 1.5, respectively. The majority of respondents responded that they were in good health, and this is a limitation of the study caused by random sampling through an online survey. In terms of the psychological factors, the average value of external locus of control was 24.87, with a standard deviation of 4.91; the average value of financial satisfaction was 21.16, with a standard deviation of 7.34; the average value of financial self-efficacy was 15.15, with a standard deviation of 5.04; and the average value of life satisfaction was 20.92, with a standard deviation of 8.35.

Table 2 Descriptive statistics of samples: Continuous factors

	Total sample (N = 997)	No insurance (n = 521)	Term only (n = 227)	Cash-value only (n = 89)	Both insurance (n = 160)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Financial status characteristics					
FRT	20.67 (4.26)	20.22 (4.09)	20.26 (3.69)	20.54 (4.20)	22.80 (4.92)
Sub. FK.	3.71 (1.58)	3.39 (1.50)	3.68 (1.50)	3.88 (1.42)	4.71 (1.61)
Demographic characteristics					
Health status	0.72 (0.45)	0.65 (0.48)	0.74 (0.44)	0.87 (0.34)	0.86 (0.35)
No. children	0.71 (1.15)	0.63 (1.17)	0.78 (1.10)	0.38 (0.89)	1.04 (1.20)
Age	47.02 (15.90)	45.55 (16.08)	47.56 (15.19)	56.06 (13.84)	44.36 (14.46)
Psychological characteristics					
LOC	24.87 (4.91)	24.85 (4.57)	24.20 (3.81)	23.73 (4.33)	26.56 (6.89)
F-satisfaction	21.16 (7.34)	19.62 (7.10)	21.04 (6.75)	24.37 (6.89)	24.59 (7.50)
F-self	15.15 (5.04)	15.59 (5.00)	14.90 (4.82)	12.70 (4.55)	15.44 (5.36)
L-satisfaction	20.92 (8.35)	18.90 (8.28)	22.08 (7.53)	22.46 (7.53)	25.00 (8.15)

Note: FRT = financial risk tolerance; Sub. FK. = subjective financial knowledge; char. = characteristics; LOC = locus of control; F-satisfaction = financial satisfaction; F-self = financial self-efficacy; L-satisfaction = life satisfaction.

#### 4.2. Results from logistic estimation and seemingly unrelated estimation

Table 3 displays the results from the four logistic regression analyses. Financial status characteristics were partially associated with having life insurance. The negative net balance was positively associated with having no insurance (coefficient = 0.31,  $p < .10$ ), meaning that those with negative net balances were less likely to have any of either term life insurance and cash value life insurance. However, the ownership of emergency funds works in the opposite direction, as those with emergency funds tended to have no term life insurance or cash value life insurance (coefficient =  $-0.47$ ,  $p < .01$ ). They were also more likely to have both term life insurance and cash value life insurance than those without emergency funds (coefficient = 0.72,  $p < .01$ ). Subjective financial knowledge showed a similar pattern to the emergency fund variable. Those who had a higher level of subjective financial knowledge were less likely to have no life insurance (coefficient =  $-0.13$ ,  $p < .05$ ), and were also more likely to have both types of insurance (coefficient = 0.26,  $p < .01$ ). In terms of financial risk tolerance, those who had a higher level of financial risk tolerance tended to be less likely to have no life insurance (coefficient =  $-0.03$ ,  $p < .01$ ) and ownership of term life insurance (coefficient =  $-0.04$ ,  $p < .10$ ).

The psychological characteristics were also partially associated with the ownership of life insurance. First, locus of control showed a negative association with no-ownership of any term life insurance or cash value life insurance (coefficient =  $-0.03$ ,  $p < .10$ ), but a positive association with the ownership of both term life insurance and cash value life insurance (coefficient = 0.05,  $p < .05$ ). This means that a person with a higher level of external locus

Table 3 Results from logistic regressions by types of life insurance ownership with seemingly unrelated estimation method for robustness

	Model 1	Model 2	Model 3	Model 4
	No insurance	Term life only	Cash-value only	Both insurances
	Coefficient (robust SE)	Coefficient (robust SE)	Coefficient (robust SE)	Coefficient (robust SE)
FS characteristics				
Negative NB	0.31 <sup>†</sup> (0.18)	−0.11 (0.21)	−0.54 (0.41)	−0.37 (0.27)
Emer. funds (yes = 1)	−0.47** (0.18)	−0.16 (0.20)	0.51 (0.35)	0.72** (0.23)
FRT	0.02 (0.02)	−0.04 <sup>†</sup> (0.02)	−0.04 (0.03)	0.02 (0.03)
Sub. FK	−0.13* (0.06)	0.01 (0.07)	−0.05 (0.09)	0.26** (0.09)
Psychological characteristics				
LOC	−0.03 <sup>†</sup> (0.02)	−0.03 (0.02)	0.03 (0.03)	0.05* (0.02)
F-satisfaction	−0.00 (0.02)	−0.03* (0.02)	0.01 (0.03)	0.02 (0.02)
F-self	−0.04 <sup>†</sup> (0.02)	−0.00 (0.02)	−0.05 <sup>†</sup> (0.03)	0.08** (0.03)
L-satisfaction	−0.03* (0.02)	0.03* (0.01)	−0.03 (0.02)	0.02 (0.02)
Demographic characteristics				
Gender (female = 1)	0.14 (0.19)	0.22 (0.22)	−0.90** (0.28)	0.22 (0.23)
Income				
\$15k - \$25k	−0.07 (0.33)	−0.58 (0.49)	0.06 (0.59)	0.91 (0.55)
\$25k - \$35k	−0.74* (0.30)	0.70 <sup>†</sup> (0.39)	0.14 (0.55)	0.95 <sup>†</sup> (0.51)
\$35k - \$50k	−0.88** (0.30)	0.88* (0.39)	0.10 (0.53)	0.99 <sup>†</sup> (0.52)
\$50k - \$75k	−0.97** (0.30)	1.04** (0.39)	−0.03 (0.56)	1.06* (0.50)
\$75k - \$100k	−1.65*** (0.33)	1.38** (0.41)	−0.52 (0.62)	1.84*** (0.51)
\$100k - \$150k	−1.64*** (0.35)	1.73*** (0.42)	−0.27 (0.61)	1.18* (0.54)
Over \$150k	−2.05*** (0.50)	1.42** (0.52)	−1.41 (0.92)	2.13*** (0.58)
Working (work = 1)	−0.24 (0.18)	0.31 (0.21)	0.03 (0.30)	0.21 (0.25)
Health status	−0.22 (0.18)	−0.27 (0.21)	0.95** (0.33)	0.43 (0.27)
Number of children	−0.11 (0.07)	−0.04 (0.07)	−0.10 (0.17)	0.24** (0.08)
Education level				
Associate degree	−0.30 (0.20)	0.27 (0.24)	0.48 (0.36)	−0.09 (0.30)
Bachelor degree	−0.29 (0.21)	0.32 (0.24)	0.18 (0.39)	−0.04 (0.31)
Graduate/higher	−0.14 (0.27)	−0.41 (0.32)	0.88* (0.42)	0.19 (0.37)
Age	−0.02** (0.01)	0.00 (0.01)	0.04*** (0.01)	−0.00 (0.01)
Race (White = 1)	0.01 (0.19)	0.14 (0.23)	0.13 (0.34)	−0.27 (0.26)
Married/coupled	−0.31 <sup>†</sup> (0.17)	0.26 (0.19)	0.40 (0.30)	0.09 (0.23)
Constant	4.57*** (0.83)	−1.06 (0.86)	−4.03** (1.30)	−8.63*** (1.14)
$\chi^2$	226.80***	95.41***	104.30***	185.49***
Pseudo $R^2$	0.16	0.09	0.17	0.21

*Note:* In Model 1, the dependent variable was ownership of neither term or cash-value life insurance; in Model 2, the dependent variable was ownership of only term life insurance; in Model 3, the dependent variable was ownership of only cash-value life insurance; and in Model 4, the dependent variable was ownership of both term life and cash-value life insurances. Reference for net balance is equal to or greater than zero net balance; reference for gender is male; reference for income category is lower than \$15,000; reference for working status is not working; reference for education level was lower than high school; reference for the race is if non-White; and reference for marital status is single. FS = financial status; NB = net balance; Emer. funds = emergency funds; FRT = financial risk tolerance; Sub. FK. = subjective financial knowledge; char. = characteristics; LOC = locus of control; F-satisfaction = financial satisfaction; F-self = financial self-efficacy; and L-satisfaction = life satisfaction.

<sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

of control (e.g., blaming external reasons) tended to have both term life insurance and cash value life insurance. Similarly, financial self-efficacy showed a negative association with no-ownership of any term life insurance or cash value life insurance (coefficient =  $-0.04$ ,  $p < .10$ ), but a positive association with the ownership of both term life insurance and cash value life insurance (coefficient =  $0.08$ ,  $p < .01$ ), which implied that a person with a higher level of financial self-efficacy was more likely to have both term life insurance and cash value life insurance. However, higher-level financial self-efficacy lowered the likelihood of ownership of only cash value life insurance (coefficient =  $-0.05$ ,  $p < .10$ ). Third, financial satisfaction was associated with only the ownership of term life insurance negatively (coefficient =  $-0.03$ ,  $p < .05$ ), which means that those who had a higher level of financial satisfaction would not purchase term life insurance. Finally, life satisfaction showed a negatively significant association with no-ownership of both term life insurance and cash value life insurance (coefficient =  $-0.03$ ,  $p < .05$ ), which implied that those who were more satisfied with their life were more likely to have either kind of life insurance. The likelihood of having ownership of only term life insurance increased by level of life satisfaction (coefficient =  $0.03$ ,  $p < .05$ ).

Demographic characteristics also demonstrated different effects of factors on ownership by type of life insurance. Some variables were model-specific. Females showed a negatively significant association only with cash value life insurance (coefficient =  $-0.90$ ,  $p < .01$ ), while the highest level of education (i.e., graduate or higher; coefficient =  $0.88$ ,  $p < .05$ ) and good health status (coefficient =  $0.95$ ,  $p < .01$ ) were positively associated with ownership of cash-value life insurance. Working status (i.e., currently working), lower levels of education (i.e., associate degree and bachelor's degree), and race (i.e., Whites) did not show any significant relevance to the ownership of life insurance. The number of children in a family showed a positive association with the ownership of both types of life insurance (coefficient =  $0.24$ ,  $p < .01$ ), and the married or coupled respondents were less likely to have no life insurance at all (coefficient =  $-0.31$ ,  $p < .10$ ). Older respondents were less likely to have no life insurance and more likely to have both term and cash value life insurance.

There was an interesting finding stemming from the income level variable. The higher the income level, the greater the probability of having life insurance (less likelihood of no ownership, term life, both term life insurance, and cash value life insurance), except for the ownership of cash value life insurance.

## 5. Discussion and implication

This study examined factors related to the ownership of life insurance by type (none, term, cash value, and both term and cash value life insurance) by focusing on the role of the financial status characteristics, psychological characteristics, and demographic characteristics. This study found that some financial status and psychological characteristics show similar and opposite patterns across models. The presence of emergency funds, locus of control, subjective knowledge, and financial self-efficacy decreased the likelihood of non-ownership of life insurance and increased the likelihood of owning both types of life insurance. Among those characteristics, the ownership of a specific type of life insurance was not significant.

Those who were more sensitive to external circumstances in terms of determining life events and were prepared for financial emergency tended to have one or both forms of life insurance (=lower likelihood of non-ownership of life insurance and a higher likelihood of ownership of both forms of life insurance). These respondents were also identified as those who perceived their financial knowledge levels to be higher and who feel more confident about themselves in terms of achieving their financial goals. All of these financial and psychological characteristics show that they would value the fundamental core of life insurance purchases more than other additional characteristics of life insurance (i.e., they would like to transfer the risk of loss of income) based on their perceptions and knowledge about the need for life insurance. Thus, it appears that they would fully understand the importance of life insurance purchases. In particular, however, those with a higher level of financial self-efficacy had a lower likelihood of cash value life insurance ownership, reflecting the fact that they would need financial advice about a further decision regarding life insurance (e.g., type of life insurance) beyond the basic purpose.

The traits of financial risk tolerance and financial satisfaction both reduced the likelihood of ownership of term life insurance, but increased that of ownership of both insurance policies, while life satisfaction increased the ownership of term life insurance and reduced non-ownership of life insurance. In other words, those who take greater financial risk and are more satisfied financially recognize the need for life insurance (i.e., they are less likely to not own life insurance), but these characteristics about financial attitude and evaluation undervalued term life insurance. This result was the opposite of that of life satisfaction. Those who were satisfied with their lives but not necessarily satisfied with its financial aspects would prefer ownership of term life insurance. Although financial satisfaction has been known to be an element of life satisfaction (e.g., Robb & Woodyard, 2011; Xiao et al., 2014), its effects on financial decisions, such as term life insurance decisions, were not necessarily in the same direction. This implies the importance of taking various aspects of psychological characteristics into consideration when investigating the determinants of life insurance ownership. Our findings warn about the generalization of the effect of seemingly related characteristics on financial decisions and suggest that financial practitioners consider each of them closely when working with clients.

Other financial status characteristics, such as negative net balances and income, were also significant in some models. Negative net balances reduced the likelihood of ownership of life insurance, while income levels were generally positively related to the ownership of life insurance; more financially stable respondents tended to have either term life or both term and cash value life insurance. As the income level went up, the likelihood of having a term life insurance policy generally increased, but this pattern was not significant in the pattern of cash value life insurance ownership. The results may suggest that term life insurance is considered to be a substitute for income.

While the ownership of term value life insurance was better explained by financial and psychological characteristics, more demographic characteristics factored into the ownership of cash value life insurance, which provides an additional investment vehicle and tax-wise asset accumulation. Cash value life insurance was in greater demand by those in good health condition (thus, having relatively less demand for a savings chunk for sudden medical costs), or older respondents (who might have limited eligibility for a term, or might be more



familiar with investment vehicles). However, females were less likely to have cash value life insurance, implying that the potential gender difference in financial decisions, and financial professionals can help them correct this aversion toward cash value life insurance if it is not beneficial to them. Married or coupled respondents were less likely to have no life insurance at all, while those with more children tended to have both types of life insurance, all of which identifies who might possibly better perceive the significance of life insurance because of the presence of financial dependents. However, work status, lower levels of education, and race were not significant in all models.

Although researchers have identified the various factors that contribute to the likelihood of life insurance ownership, few studies have attempted to approach the subgroup analyses. Our findings confirmed the importance of conducting separate analyses by policy type (i.e., no ownership, only term life insurance, only cash value life insurance, and both term and cash value life insurance), and deepened the discussion about the factors related to life insurance ownership.

Our findings are in line with the different characteristics and purposes of term and cash value life insurance. Cash value life insurance was likely to be used to complement other wealth accumulation vehicles rather than as a simple substitute for lost income from premature death, whereas term life insurance was still seen as pure protection for the potential loss of future income. The results are consistent with previous work (e.g., Heo et al., 2013), which suggests that the purpose and characteristics of cash value life insurance should not be treated in the same way as those of term life insurance. Thus, the findings regarding the differences in consumer demand between cash value life insurance and term life insurance in terms of the influential characteristics and underlying purpose of the life insurance purchase suggest a need for a more careful approach to the study of life insurance ownership and the incorporation of psychological factors in the analysis. The findings suggest that consumers can be better served when financial practitioners and researchers more carefully identify and accommodate consumers' needs for different types of life insurance. Various idiosyncratic characteristics of consumers, including financial, psychological, and demographic factors, should be considered along with the functional purposes of the life insurance being purchased.

Finally, there are some study limitations of the study to mention here. First, this study used an online consumer survey based on random sampling methods, as an online survey has been shown to better reach a broader population in different geographic locations. However, our sample distribution was somewhat skewed in terms of some demographic variables, such as gender, race/ethnicity, and income. Therefore, the findings of the research need to be generalized with caution, and future studies can extend the discussion by examining a more diverse population. The survey used for the study also does not include questions about the amount of the life insurance policies or how the insurance was purchased (e.g., through an employer, such as group life insurance, or individually), which can possibly be related to the ownership of life insurance and might be helpful to financial professionals when identifying the needs of their clients before advising them in their decision of what type of life insurance policy to pursue. Thus, future studies are desired to examine additional characteristics of life insurance purchasing with different data.



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# Focusing on both sides of the balance sheet: the potential benefit of liability management

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## Abstract

Debt has become a significant issue among U.S. households with average household interest payments on liabilities exceeding expected returns on investment assets by more than 50%. In this study, we explore the role of U.S. household debt and analyze the impact of different economic, demographic, and behavioral factors on household borrowing decisions, with a particular focus on “good” and “bad” debts, which depend on type and interest rate. We estimate significant potential benefits with improved liability management and find that households with lower asset, income, and education levels are likely to benefit most from assistance with debt optimization. © 2021 Academy of Financial Services. All rights reserved.

*JEL classification:* D12; G4; D15

*Keywords:* Debt management; Retirement financial planning; Behavioral finance; Financial decision making

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## 1. Introduction

Debt is an increasingly significant part of the U.S. household balance sheet. After the 2007–2009 economic recession, debt levels of American households have increased significantly (Bricker et al., 2017). The total U.S. household indebtedness was approximately \$14.27 trillion as of June 30, 2020, according to the Federal Reserve Bank of New York. This is higher than the previous peak of \$12.68 trillion in the third quarter of 2008 (adjusted to 2019 dollars) and has increased by 27.9% since the second quarter of 2013 (Federal Reserve Bank of New York, 2020). Additional information on this effect is shown in Fig. 1.

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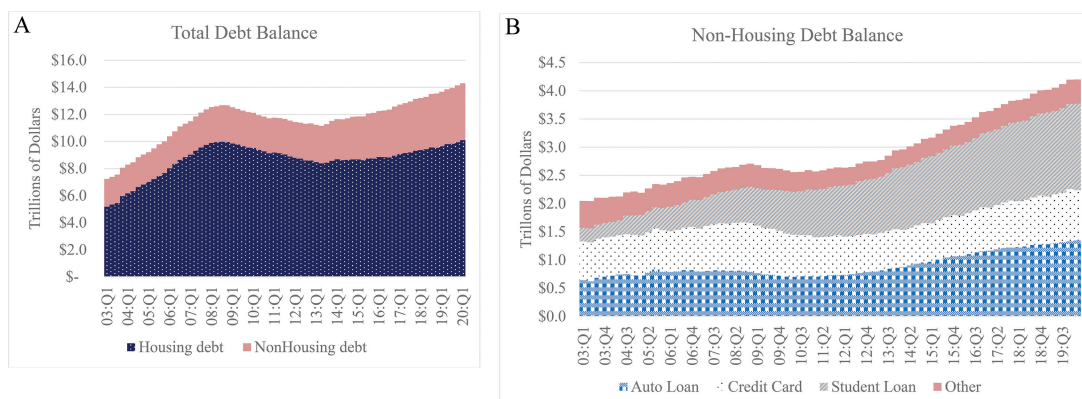


Fig. 1. Growth trends in U.S. consumer credit owned. *Source:* Federal Reserve Board NY 2020 Consumer Credit Panel/Equifax.

Financial firms and advisors tend to spend significantly more time focusing on the assets side of the household balance sheet compared with the liability side. This focus is consistent with the traditional skill set of financial advisors—building portfolios—and reflects how they are typically compensated (e.g., as a percentage of assets under management). However, in this study, we demonstrate that this predominant attention paid to the assets does not necessarily reflect the economic importance within the context of the household's entire balance sheet (i.e., when liabilities are taken into consideration). For example, data from the 2016 Survey of Consumer Finances (SCF) suggest that among “low-to-affluent” U.S. households, the total interest payments on debts exceed the expected gains from their financial assets.<sup>1</sup> Therefore, spending time on “debt optimization” is likely to result in better outcomes than focusing on assets alone.

In this article, we explore the composition of household balance sheets in the United States to understand the potential benefits associated with making more intelligent debt decisions. Consistent with past research, we find that certain types of “bad” debts, such as credit cards, are relatively common on household balance sheets today despite their high interest rates (averaging approximately 15%).<sup>2</sup> It is not clear to what extent interest rates could be lower had the household done more due diligence on its debt decisions, or the extent to which these debts can be refinanced, but it is likely that some, and possibly many, households' situations can be improved (i.e., the household could reduce the interest rate on outstanding debt). This analysis suggests more work should be done to understand the potential benefits of improving household credit decisions.

The objective of this study is to demonstrate the urgency, importance, and potential impact of household liability management by answering the following questions: What is the current financial situation and retirement outlook of low-to-affluent U.S. households? What factors are associated with household debts and leverage ratios? What is the difference between “good” and “bad” debts?<sup>3</sup> Will the attributes related to households carrying different types of debts be similar? What kinds of families are more likely to have higher average debt interest rates and how much could they save by accessing liability optimization?

## 2. Literature review

Using data from multiple waves of the SCF, Emmons and Noeth (2013) report that the household leverage ratio, defined by the sum of total debts divided by total assets, is higher among younger families. Also using SCF data, Barba and Pivetti (2009) demonstrate that the rising household indebtedness is associated with a decrease in the household savings rate. This phenomenon is partially explained by lagging real wage growth and the tendency for U.S. households to sustain their relative consumption level. Based on data from *Consumer Finance Monthly*, Jiang and Dunn (2013) show that younger consumers have higher levels of credit card debt and are repaying that debt at lower rates than previous generations.<sup>4</sup>

Using the Health and Retirement Study (HRS), Gustman, Steinmeier, and Tabatabai (2011) find that relative debt levels have been increasing for households that are near retirement since the 2007–2009 recession and that much of the growth in debt appears to be related to mortgage and housing expenses. The Quarterly Report on Household Debt and Credit for the second quarter of 2020 supports this finding, reporting \$9.78 trillion of mortgage balances for U.S. households (Federal Reserve Bank of New York, 2020). Using the HRS, Lee, Lown, and Sharpe (2007) study the dissaving behavior of older Americans and point out that financial debt carried into later life may result in reduced access to essential health care, restrictions on activities, and delayed retirement.

Among the different categories of household liabilities, high-interest debts such as consumer revolving credit debts can have significant negative impacts on household balance sheets and cash flows. Based on information from the Federal Reserve Bank of New York (2019), credit card balances stood at \$870 billion as of the last quarter of 2018, with a seasonally adjusted annual growth rate of 3%. Auto loan originations reached the highest amount in the 19-year recorded history of the New York Fed in 2018, amounting to \$584 billion. Unlike certain good debts, which tend to have lower relative interest rates and are typically used to purchase assets that are expected to generate long-term income or grow in value (e.g., mortgages), bad debts such as credit cards, payday loans, and some auto loans typically have higher interest rates and are generally associated with purchases (and assets) that do not generate positive long-term returns (Hanson, 2006). In other words, the cost of the good debts can often be outweighed by their potential long-term benefits, while the bad debts' high interest costs typically have little-to-zero long-term returns. Bad debts are not only expensive, but they may also negatively influence the borrowers' credit scores, hinder their financial and retirement goals, and even cause stress and health issues. Davies, Montgomerie, and Wallin (2015) report a positive relationship between individuals who are deeply in debt and those who report mental health problems such as depression and physical illness. Behavioral studies also indicate that consumers may be more likely to accumulate a larger revolving credit card balance if they frequently pay behind schedule or miss payments (Kim & DeVaney, 2001; Wärneryd, 1999). Therefore, helping consumers stay away from "bad" debt and coaching them to develop good borrowing and accumulation habits are essential approaches for advisors and financial planning firms to support their clients' liability management.



This effect, in which households spend more on their debt than they earn on their savings, is likely to continue in the future given the growth in debt among American households, as noted in Fig. 2. Therefore, it is essential for financial planning firms and advisors to start putting a greater emphasis on their clients' debt structures and help them better manage their liabilities in order to help ensure that they can achieve a successful retirement.

Zinman (2015) notes that research on the household debt has significantly lagged its sister literature on the asset side of the balance sheet. While one may assume that households make rational decisions regarding debt, Stango and Zinman (2016) find that cross-consumer dispersion in credit card borrowing costs remains substantial even after controlling for debt levels, credit risk, and product characteristics.

While the share of U.S. households with debt has been relatively constant, ranging from 72.3% in 1989 to 77.1% in 2016 (Bricker et al., 2017), the mean value of debt for American families has increased significantly, from \$66,900 in 1989 (in 2016 dollars) to \$123,400 in 2016. This magnitude of debt increase has been observed across age levels. Within the 2016 SCF survey wave, the percentage of households carrying debt peaked around middle age (approximately 45 years old), with the most common debt categories being mortgages, credit card debts, auto loans, and student loans, as noted in Fig. 3.

Not surprisingly, interest rates differ significantly across different types of loans. In Fig. 4 we provide context regarding the distribution of interest rates for households by loan type, again using 2016 SCF data.

Fig. 4 shows that unsecured personal loans (such as credit card loans and other consumer loans) typically have the highest interest rates. These loans are also typically categorized as bad debts because they are not used to purchase assets that improve the long-term financial condition of the household and rather are used to purchase items that are more consumption-based in nature.

Fig. 5 jointly illustrates the prevalence of different loan types and the median interest rates among the households in which the head-of-household is 45 years old. While median interest rates are relatively static across ages, age 45 is selected as the representative age because it is the approximate peak age for indebtedness, as previously noted in Fig. 3.

Our study explores the urgency and importance of liability management for American households. The article consists of the following sections: First, this study utilizes SCF data to develop a general picture of U.S. households' financial situations in terms of their balance sheet characteristics. Second, we review the liability side of households' balance sheets to investigate the prevalence of different types of consumer debts and the interest rates associated with them. Third, we analyze a number of economic and demographic factors that are associated with household debts. After exploring the attributes that potentially relate to the households carrying bad debts, we then identify the characteristics of households that have higher average debt interest rates. Finally, we demonstrate the impact of liability management in terms of investment alpha-equivalent ("excess investment return"-equivalent) analysis and the potential dollar amount that can be saved through interest rate reduction relative to financial asset considerations.



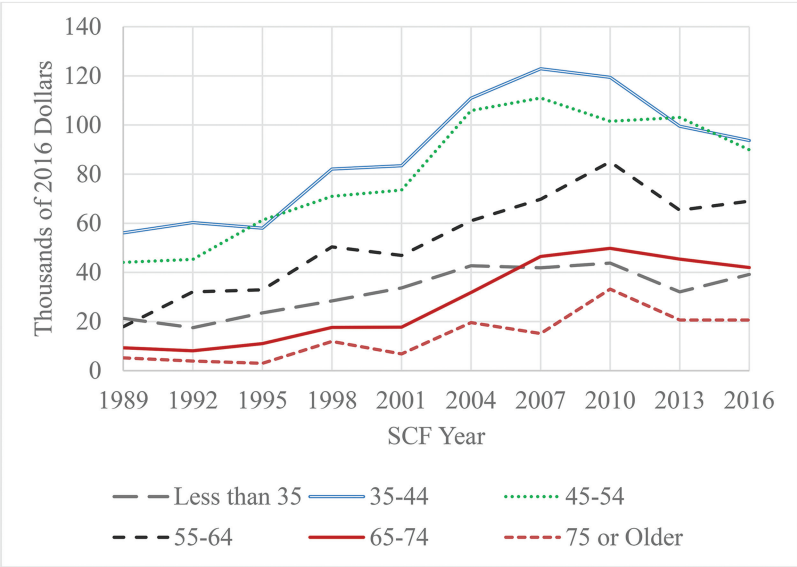
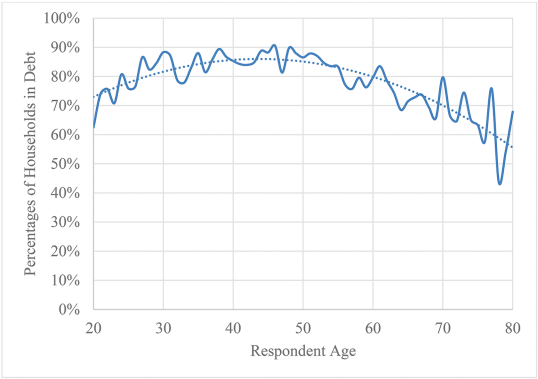


Fig. 2. Mean value of debt for U.S. families with debt holdings. *Source:* Federal Reserve Board Survey of Consumer Finances (SCF) Bulletin 2017. *Notes:* All respondents in the 2016 SCF data are included in this graph. The age of the household is represented by the age of the household head.

3. Theory

The household consumption decision involves a trade-off between consuming more today (borrowing) and consuming more in the future (saving). The borrowing and saving behavior of households is largely driven by their intertemporal consumption choices, affected by their time-discounting preference, investment interest rates, and other factors.

Panel A: Hold and Debt



Panel B: Type of Debt

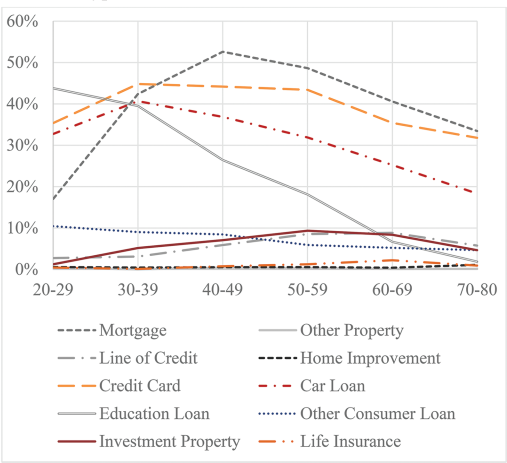


Fig. 3. Probability of a household having debt. *Source:* Federal Reserve Board Survey of Consumer Finances 2016 survey wave. *Notes:* Weights applied. Other consumer loans include loans for household appliances, furniture, hobby or recreational equipment, medical bills, friends or relatives, etc. This category does not include credit cards, margin loans, or loans against life insurance or pensions.

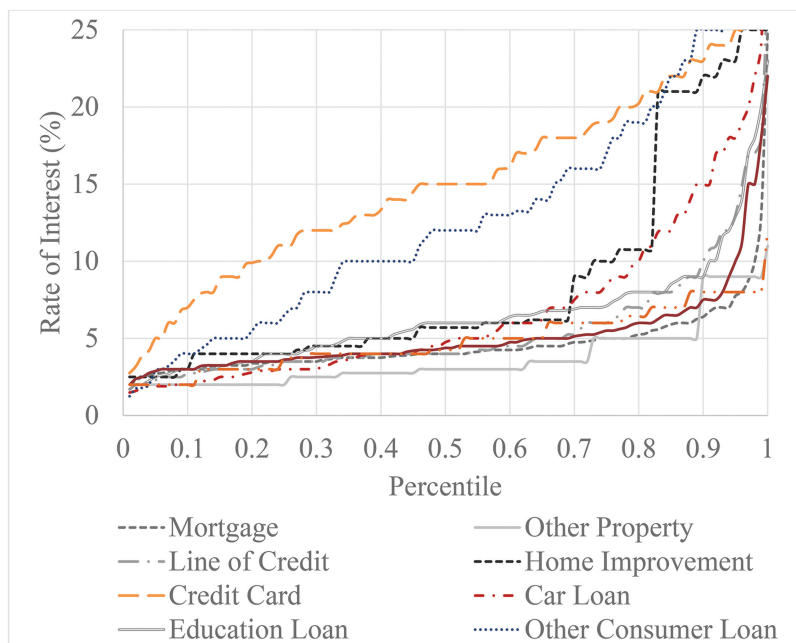


Fig. 4. Distribution of household loan interest rates. *Source:* Federal Reserve Board Survey of Consumer Finances 2016 survey wave. *Notes:* Weights applied. This figure shows the percentile distribution of interest rates across different types of loans. Other consumer loans include loans for household appliances, furniture, hobby or recreational equipment, medical bills, friends or relatives, etc. This category does not include credit cards, margin loans, or loans against life insurance or pensions.

To better analyze the liability management of U.S. households, we structure our theoretical framework according to the life-cycle hypothesis (Jappelli & Pagano 1989; Modigliani 1986), which holds that a household chooses a consumption path to maximize its lifetime utility

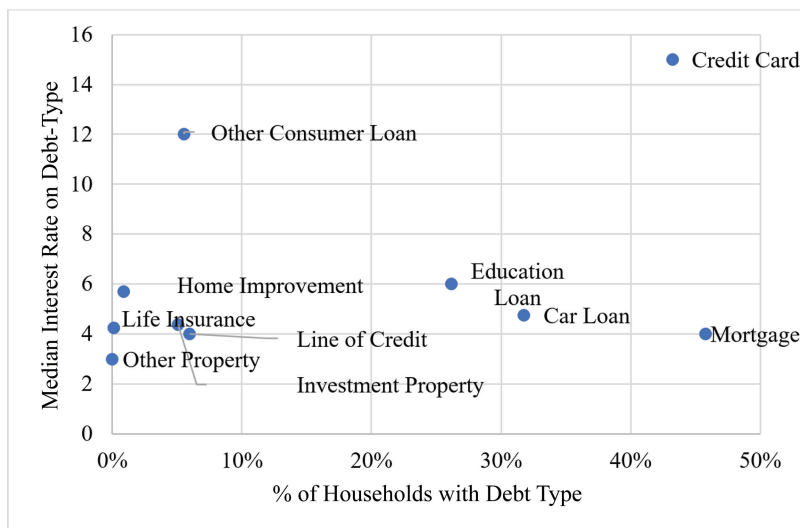


Fig. 5. Loan prevalence and median interest rates. *Source:* Federal Reserve Board Survey of Consumer Finances (SCF) 2016 survey wave. *Notes:* Weights applied. This graph uses a subsample of 45-year-old respondents to illustrate the prevalence and median interest rates of different types of household debts in the SCF data.

subject to an intertemporal budget constraint. We start with a simple two-period life-cycle model to understand the dynamic intertemporal choice issue. Then we generalize this model to multiple periods to capture the households' liability decisions for different life stages.

In the two-period model, a household maximizes its utility described as following:

$$U(c_1, c_2) = u(c_1) + \delta u(c_2) \quad (1)$$

where  $c_1$  and  $c_2$  are consumptions in periods 1 and 2, respectively.<sup>5</sup>  $\delta$  is the discount factor that depicts the household's time preference. The assumption of  $0 < \delta < 1$  illustrates the tendency that present consumption is always more preferable than future consumption.  $\delta$  is more close to 0 when the household is more future-discounting. If  $\delta$  is close to 1, the household has no preference between present and future consumptions.

The two-period budget constraint that the household faces can be represented by the following inequalities:

$$c_1 + s \leq y_1 \quad (2)$$

$$c_2 \leq (1 + r) s + y_2 \quad (3)$$

where  $y_1$  and  $y_2$  are the income of the household for period 1 and period 2, respectively. The borrowing/saving factor is symbolized by  $s$ . If  $s > 0$ , then the household saves in period 1. If  $s < 0$ , then this household borrows in period 1; thereby, forfeiting investment opportunities and reducing the consumption in period 2.  $r$  represents the prevailing interest rate in the financial markets. If  $s > 0$ , then  $r$  stands for the investment return from savings. If  $s < 0$ , then  $r$  can represent the interest charged for the debt the household borrows during period 1.

Substituting out the borrowing/saving factor  $s$ , we obtain the "lifetime budget constraint." This constraint represents the fact that the discounted present value of all periods' consumption must be less than or equal to the discounted present value of lifetime income:

$$c_1 + \frac{C_2}{1+r} \leq y_1 + \frac{y_2}{1+r} \quad (4)$$

Now the household's intertemporal consumption choice model can be rewritten as:

$$\begin{aligned} & \text{Max}_{\{c_1, c_2\}} U(c_1, c_2) = u(c_1) + \delta u(c_2) \end{aligned} \quad (5)$$

$$\text{s.t. } c_1 + \frac{C_2}{1+r} \leq y_1 + \frac{y_2}{1+r}$$

Using the Lagrangian technique, the solution to this problem is:

$$FOC(c_1): u'(c_1) = \lambda \quad (6)$$

$$FOC(c_2): \beta u'(c_2) = \frac{\lambda}{1+r} \quad (7)$$

$$FOC(\lambda): c_1 + \frac{C_2}{1+r} \leq y_1 + \frac{y_2}{1+r} \quad (8)$$

Putting the first order conditions together, we arrive at the Euler equation:

$$\frac{u'(c_1)}{\delta u'(c_2)} = (1+r) \quad (9)$$

This equation describes the intertemporal optimal consumption choice between the current and future period: The marginal rate of substitution (appropriately discounted by  $\delta$ ) is equal to the gross interest rate, which represents the relative price between consumption in period 1 and consumption in period 2. In terms of saving ( $s > 0$ ), if  $r$  is high, the price of consumption in period 1 is high because the household is forgoing a high interest rate of investment return. In the case of borrowing debt ( $s < 0$ ), the interpretation still applies: If  $r$  is high, the price of consumption in period 1 is high because the household is paying a high borrowing cost due to the high interest rate. The Euler equation implies that the household maximizes utility by smoothing the consumption path over the life cycle, which explains the borrowing behavior of the household.

The two-period intertemporal consumption model can be generalized for multiple-period analysis. Assume a household's finite lifetime can be categorized into  $T$  different periods. In each period  $t$ , the household has income  $y_t$ , saves or borrows  $s_t$ , and consumes  $c_t$ . Then the household's intertemporal consumption choice model is as follows:

$$\begin{aligned} & \text{Max}_{\{c_1, c_2, \dots, c_t\}} E \left[ \sum_{t=1}^T \delta^{-t+1} u(c_t) \right] \\ & \quad (10) \end{aligned}$$

$$s.t. \sum_{t=1}^T (1+r)^{-t+1} c_t \leq \sum_{t=1}^T (1+r)^{-t+1} y_t \quad (11)$$

where  $\delta$  is still the discounting factor measuring the households' preference for present versus future, and  $r$  is the rate of return on the investment (or interest rate of borrowing on the debt).

Similarly, one can derive the solution to this problem and arrive at the generalized Euler equation:

$$E_t \left[ \frac{u'(c_t)}{\delta u'(c_{t+1})} \right] = (1+r) \quad (12)$$

Notice that the Eq. (12) can be rearranged into:

$$E_t \left[ \frac{u'(c_t)}{u'(c_{t+1})} \right] = (1 + r) \delta \quad (13)$$

Then we can interpret the Euler Eq. (13) as the marginal rate of substitution between the period ( $t$ ) and the next period ( $t + 1$ ), is equal to the product of the gross interest rate and the time discounting factor. In other words, the households smooth their lifetime consumption paths based on two factors, the interest rate (borrowing or investing) and their time discounting preference.

There have been some variations to the life-cycle model since its development. For example, the presence of liquidity and borrowing constraints has been brought up to modify the model for better suitability to empirical analysis. In our analysis, we assumed that U.S. households are able to leverage from various lending sources to achieve their consumption smoothing and combine the liquidity and dollar amount borrowing constraints into the interest rate constraint (the household's tolerance of high interest rates).<sup>7</sup> We also consider households' liquid assets in our analysis to investigate their debt problems. To capture the discounting preference of American families, we use the household's financial planning horizon as a proxy in the empirical analysis.

The household consumption decision model provides guidance on what to expect in the regression analysis results presented in this article. For instance, we expect to observe that interest rates significantly affect household leverages across various debt types. Households with relatively longer financial planning horizons are less likely to carry debt (or they have lower debt amount, debt-to-income ratio, and debt-to-asset ratio) compared with the households whose financial planning horizons are short. Liquid asset holdings should significantly reduce the household debt level. Detailed discussion on the regression results will be presented in the following sections.

#### 4. Data and methodology

This article uses data from the SCF to analyze the characteristics of U.S. household finances. The SCF, conducted by the Federal Reserve Board, is a nationally representative cross-sectional survey of U.S. households. This triennial survey collects a variety of information on income, balance sheet, and demographic characteristics from a selection of more than 6,000 American families in each survey wave. Using the 2016 survey wave, we study the characteristics of the balance sheets of American households, explore the factors that are associated with high debt-to-asset ratios for certain households, and investigate the benefit of liability management for these households.<sup>8</sup>

For our analysis, we focus on “low-to-affluent” American families, which we define as households with less than \$1 million in financial assets. Households with very high net worth often have their own unique leveraging and investment strategies, and optimizing these strategies is beyond the scope of this article.

The comprehensive perspective of the average household balance sheet (see Appendix A) indicates that the average return on financial (i.e., investment) assets is approximately 62% of the debt interest charges for the average U.S. household. In other words, the average U.S.

family is spending more on interest servicing household debt than they are earning from investing their financial assets. This is despite a significant focus on managing the asset side of the household balance sheet that is common within the financial advising profession.

The focus of this article is to explore how low-to-affluent American families can potentially benefit from debt restructuring and liability management with assistance from their financial planners and advisors. Because of the nature of the SCF data, which oversamples high-income households (Aizcorbe, 2003; Nielsen 2015), we apply sample weights to all the empirical analyses. In addition to focusing only on households with less than \$1 million in financial assets, we also restricted the opportunity set to households whose head is between 20 and 85 years old and that had an annual family income of at least \$1,000. After applying these restrictions, our analysis sample is reduced to 4,481 households (see Appendix B for descriptive statistics of the analysis sample). Because each household in the 2016 SCF data has five implicates, the total number of observations in our analysis sample is 22,415.<sup>9</sup> To cope with the dual-frame complex sample design and the multiple-imputation process of the SCF data, this study use the “SCFcombo” Stata macro designed by Nielsen (2015) to conduct our regression analyses.<sup>10</sup>

## 5. Results and discussion

The regression analyses used in this article follow these steps: First, we use probit and ordinary least squares (OLS) regressions to study what factors are associated with household debt. We look at the economic, demographic, and behavioral factors that could potentially impact the likelihood of carrying household debt, the total debt amount, the debt-to-financial-asset ratio, and the debt-to-income ratio. Second, we isolate what are frequently considered bad debts (represented by credit card debts) and compare them with debts that are typically viewed as good debts (represented by mortgages) to see whether the factors associated with different debt categories are similar. Then, we utilize different interest rate measures to check the attributes that relate to high interest rates. Finally, we perform alpha-equivalent analyses and calculated the potential savings to demonstrate the impact of liability management and interest rate reduction from a financial asset perspective. Detailed descriptions and summary statistics of the variables used in the regression analyses are presented in Appendix B.

Table 1 presents the results of the probit and OLS regressions to better understand what factors are associated with household debts. The dependent variables in these regressions include “whether the household carries debt,” “total debt amount,” “debt to financial asset ratio,” and “debt to income ratio.” The marginal effect results of the probit regression in Table 1 provide a general picture of what factors are associated with low-to-affluent American families’ debt holdings. The OLS regression demonstrates the impact on household debt amounts from each of these factors. In some cases, relatively wealthier families that are in good financial conditions still carry larger amount of debt due to their high income or sizeable financial asset accumulations. While some financially challenged families might not be carrying a sizable sum of debt in terms of dollar amounts, these debts are typically detrimental to their financial well-being compared with their income and asset levels. To consider these cases, we analyze the debt-to-financial-asset ratio and the debt-to-

income ratio in comparison with the analyses on the likelihood of having debts and the total debt amount. The intertemporal model discussed in the Theory Section above suggests that time discounting preference should affect households' consumption smoothing behaviors significantly. Therefore, we expect to see from the results in Table 1 that households with longer financial planning horizons are less likely to carry debt, have lower debt-to-asset ratio as well as lower debt-to-income ratio. In addition, we expect to see a significant negative relationship between the households' liquid asset levels and the likelihood of carrying debts, total debt amount as well as debt-to-income ratio.

Based on the results in Table 1, married families and households with children are more likely to carry debts. Families that own houses are much more likely to borrow, and the more real assets a family owns, the more likely this family is to carry debts. Liquid assets and age are negatively related to the likelihood of having debts. This is most likely because households are less likely to borrow if they have enough liquid assets to cover their needs, which supports the advocacy of emergency savings through liquid accounts for the general public. Older families are less likely to have debts because they generally have had a longer time to accumulate wealth and pay off their various household debts.

It appears to be counterintuitive that education and income level, as well as reporting having savings, are positively related to carrying household debts. However, if we consider the OLS results together with the marginal effects of the probit regression, the impact of these factors on household debts becomes clear. For instance, although high-income families are more likely to leverage and have larger debt sizes, their debt-to-income ratios are lower and negatively related to their income level. Households that have savings demonstrate much lower debt-to-financial-asset ratios, despite the higher likelihood to borrow, with other variables such as liquid asset levels controlled.

The combined results could indicate that these families may be more financially literate and leverage lower-interest debts to increase their investments in financial assets and savings. When it comes to education level, more educated households are more likely to carry debts, have higher debt balances, and have a higher debt-to-income ratio, keeping all other factors, such as income and assets, the same. This is a strong indication of the impact of student loans on these families. *Ceteris paribus*, educated families are more likely to carry student loans compared with the less educated ones, because of the prevalence of student loans used to finance education today.

A family's financial planning horizon is also a strong behavioral indicator of household debts. Households with longer financial planning horizons are much less likely to have debts. Total debt amount, as well as debt-to-financial-assets ratio and debt-to-income ratio, are all negatively associated with a longer financial planning horizon. This finding supports the myopic planning hypothesis, which predicts that having a myopic financial planning horizon fuels households' borrowing and may lead families deeper into debt. It also suggests that promoting long-term financial planning horizons serves as a good approach to help families with their liability management.

"Not all debt is created equal," as the saying goes. While good debts are typically defined as those with lower interest rates that help households finance activities and purchases that provide long-term benefits (e.g., mortgages), bad debts are usually associated with higher interest rates and are used to purchase depreciating assets that do not generate long-term



Table 1 Probit and ordinary least squares (OLS) regressions on factors associated with household debts

Variables	Probit (ME) <sup>a</sup> Have debt	OLS Total debt amount (\$)	OLS Debt-to-financial-asset ratio <sup>b</sup>	OLS Debt-to-income ratio <sup>c</sup>
Married	0.115** (0.039)	−819.6 (3,577.505)	−119.2 (186.344)	−0.223* (0.102)
Number of kids	0.0787*** (0.019)	5,433.1*** (762.826)	151.1 (142.587)	0.0172 (0.025)
Education level	0.0593*** (0.007)	2,830.9*** (658.963)	−62.01 (33.751)	0.102*** (0.020)
Real assets (per \$10K)	0.0109*** (0.002)	4,314.9*** (207.030)	6.767 (8.760)	0.0416*** (0.003)
Liquid assets (per \$10K)	−0.0794*** (0.010)	−4,076.7*** (0.051)	7.407 (0.001)	−0.0459*** (0.000)
Have houses	0.583*** (0.057)	6,711.6** (2,509.261)	123.3 (253.975)	0.750*** (0.069)
Have savings	0.298*** (0.035)	3,114.6 (1,963.956)	−853.9*** (149.459)	0.109 (0.089)
Race Black	0.126* (0.052)	8,291.1*** (1,863.746)	216.5 (300.610)	0.116 (0.067)
Race Hispanic	−0.0300 (0.052)	−525.3 (4,670.203)	−177.6 (300.430)	0.116 (0.088)
Race other	−0.0178 (0.062)	4,989.8 (2,683.881)	−511.6** (184.211)	0.443 (0.226)
Income (per \$10K)	0.0578*** (0.011)	3,410.2** (1,128.458)	−35.24 (18.272)	−0.0950** (0.029)
Age	−0.0161*** (0.001)	−1,237.7*** (52.300)	−12.94*** (3.904)	−0.0238*** (0.002)
Financial planning horizon (omitted baseline category “next few months”)				
Next year	−0.150** (0.052)	−3,839.2 (2,043.248)	−930.4** (286.531)	0.136 (0.160)
Next few years	−0.0195 (0.043)	−5439.2* (2,269.333)	−734.6* (293.134)	−0.123* (0.057)
Next 5 to 10 years	−0.202*** (0.050)	−11,861.2*** (2,530.713)	−969.5*** (262.833)	−0.193** (0.070)
Longer than 10 years	−0.245*** (0.060)	−6,553.9* (3,156.322)	−630.7* (306.992)	−0.276** (0.090)
N	4,481	4,481	4,481	4,481

Notes: <sup>a</sup> This column reports the average marginal effect of the probit regression. The 2016 Survey of Consumer Finances (SCF) sample weights were applied to the regressions. <sup>b</sup> The analysis sample in this regression includes the households whose debt to financial asset ratio equals to zero. For the reduced-size analysis sample which only includes the households who carry debt, please see the reduced sample regression results in Appendix C. <sup>c</sup> The analysis sample in this regression includes the households whose debt to income ratio equals to zero. Alternative regression with the reduced sample where only households with debts are included is discussed in Appendix C. Standard errors in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

benefits. The costs associated with good debts are often outweighed by the benefits. Bad debts, on the contrary, carry high interest rates with little or no long-term returns (Hanson, 2006). These types of debts can potentially negatively impact the borrower's credit scores, retirement goals, and financial health, as well as family relationships. In some circumstances, bad debts can create a vicious borrowing cycle for some families and cause stress and mental as well as physical health problems (Davies, Montgomerie, & Wallin 2015). The negative health effects of debt (i.e., the “high price of debt”) is a phenomenon noted both in the United States (Sweet et al., 2013) and internationally (Clayton, Liñares-Zegarra, & Wilson, 2015).

This article explores the different factors that are potentially related to households carrying bad debts. We first investigate these potential factors by separating debt categories. (In Table 2, we chose credit card revolving balances as a representation of bad debt and mortgages as an example of good debt.) Then, we utilize different interest rate measures to check the relationships between these factors and high interest rates (Table 3).

Although liquid assets and interest rates are both predicted to be associated with household leveraging, we expect these factors to play different roles when it comes to “good debts” versus “bad debt.” In particular, we want to test whether interest rate has more significant negative relationships with mortgages due to the large size and long durations of the debt, and whether liquid assets level is more significantly and negatively related to credit card debts due to the “liquidity needs compromise.” In addition, we expect to observe negative significant relationships between household financial planning horizons and the amount of both types of debts. The regression results in Table 2 indicate that although some household attributes are related to both good and bad debts, certain factors are particularly noteworthy when it comes to explaining what kinds of households are more likely to carry bad debts. Having more children is positively associated with both credit card loans and mortgages. However, other factors such as interest rate, real assets, liquid assets, and income have different relationships with credit card debt compared with mortgages. For instance, mortgages are more sensitive to interest rate changes, but credit card loans are more sensitive to liquid assets and income. The reason behind this difference could be interpreted as “liquidity needs” compromise. Credit card loans are often used to cover short-term liquidity needs. Their insensitivity toward interest rates could be largely caused by a lack of liquid assets to cover certain short-term needs (such as holiday shopping, etc.). Therefore, credit card debts are negatively related to liquid asset levels. On the contrary, mortgages are negatively associated with interest rates because of their relatively larger debt size (hence larger interest payments) and longer investment horizon.

One interpretation of the income effect on credit card loans could be that, keeping everything else (including liquid assets) equal, households with higher incomes have the ability and resources to borrow—and pay back—more credit card loans. Age is another factor that is only negatively related to mortgages. This finding indicates that older households are more likely to have had a longer time to pay off their mortgages and hence reduce the size of this type of good debt. Because houses are a major component of most households' real assets, it is not surprising that the real asset level is positively related to family mortgage loans. The financial planning horizon factor is negatively associated with both credit card loans and mortgages in

Table 2 Ordinary least squares (OLS) on different debt categories

Variables	“Bad” debts (credit and store cards balance)	“Good” debts (mortgages)
Interest rate	−28.40 (18.556)	−1,673.5* (677.040)
Married	265.1 (364.032)	−4,993.6 (4,070.197)
Number of kids	275.3* (122.659)	5,148.3*** (1,183.437)
Education level	76.84 (54.142)	1,626.4* (771.444)
Real assets	0.00197 (0.001)	0.393*** (0.020)
Liquid assets	−0.0328*** (0.003)	−0.0817 (0.067)
Have houses	519.9 (388.969)	Omitted
Have savings	−419.8 (262.935)	−823.7 (3,076.358)
Race black	−528.6 (345.616)	7695.6 (4,149.247)
Race Hispanic	−685.3* (314.295)	6,027.6 (9,231.032)
Race other	−247.4 (311.224)	4,493.5 (5,760.525)
Income	0.0201** (0.007)	0.144 (0.090)
Age	13.30 (6.916)	−1,009.6*** (106.106)
Financial planning horizon (omitted baseline category “next few months”)		
Next year	−685.5 (386.068)	1,138.5 (4,312.770)
Next few years	−861.4** (322.013)	−6,064.8 (4,592.322)
Next 5 to 10 years	−1,109.0*** (329.694)	−9,363.6** (3,520.808)
Longer than 10 years	−1,368.6** (483.781)	−12,236.5** (4,396.354)
N	2,808	1,661

Notes: Not all of the respondents in our analysis sample reported the interest of different kinds of loans. Therefore, the number of observations was reduced in the regressions above. The 2016 Survey of Consumer Finances (SCF) sample weights were applied to the regressions. Standard errors in parentheses.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Table 2. This is consistent with the previous regression results, indicating that families with longer financial planning horizons are less likely to carry both kinds of debts.

A major focus of household liability management is to help the targeted families to reduce the interest rates of their debts. The following analysis seeks to explore what kind of factors are associated with higher household interest rates. We expect to see negative relationships between the weighted average interest rate and certain household characteristics such as real and liquid asset levels, household head education level, homeownership, savings, as well as being married and having a longer financial planning horizon. In Table 3, we use different measures to capture the households’ average interest rates as well as the percentile ranking of the average interest rates. The weighted average interest rate takes into account the dollar amount weighted average interest rates across all loan types. For example, for each household, the dollar amount of different loans is multiplied by their interest rates to calculate the overall liability cost per year. Then this liability cost is divided by the total loan amount to acquire the weighted average interest rate for this household. The simple average interest rate measure takes the arithmetic average of the interest rates across all loan types. This measurement, together with the weighted average interest rate percentile and simple average interest rate percentile measures, serves as a robustness check for the weighted average interest measurement. Based on the OLS regression results from Table 3, households with less education, lower levels of assets, fewer savings, and older age are

Table 3 Ordinary least squares (OLS) on average interest rate measures

Variables	Weighted <sup>a</sup> average interest rate	Weighted average interest rate percentile	Simple <sup>b</sup> average interest rate	Simple average interest rate percentile
Married	−1.187** (0.378)	0.00524 (0.009)	−0.789* (0.350)	0.00903 (0.009)
Number of kids	0.0337 (0.102)	0.0108*** (0.003)	0.164 (0.102)	0.0110*** (0.003)
Education level	−0.319*** (0.054)	−0.00613*** (0.002)	−0.277*** (0.051)	−0.00680*** (0.001)
Real assets (per \$10K)	−0.0381*** (0.007)	−0.00128*** (0.000)	−0.0431*** (0.008)	−0.00142*** (0.000)
Liquid assets (per \$10K)	−0.141*** (0.000)	−0.00348** (0.000)	−0.166*** (0.000)	−0.00388*** (0.000)
Have houses	−0.888** (0.342)	−0.00484 (0.010)	−0.368 (0.402)	−0.00774 (0.009)
Have savings	−0.826* (0.364)	−0.0164** (0.006)	−0.851* (0.354)	−0.0174** (0.005)
Race Black	−0.506 (0.384)	0.0307** (0.009)	0.0127 (0.336)	0.0284*** (0.008)
Race Hispanic	0.749 (0.413)	0.0452*** (0.011)	1.332*** (0.509)	0.0358*** (0.010)
Race other	0.0260 (0.420)	0.0126 (0.011)	0.627 (0.473)	0.0166 (0.011)
Income (per \$10K)	−0.0255 (0.040)	−0.00109 (0.001)	−0.0302 (0.041)	−0.00166 (0.001)
Age	0.0462*** (0.010)	0.000589* (0.000)	0.0297*** (0.009)	0.000559* (0.000)
Financial planning horizon (omitted baseline category “next few months”)				
Next year	−1.343*** (0.406)	−0.00407 (0.011)	−0.396 (0.416)	−0.0109 (0.010)
Next few years	−0.505 (0.507)	−0.0188* (0.009)	−0.335 (0.447)	−0.0128 (0.008)
Next 5 to 10 years	−1.359*** (0.346)	−0.0185 (0.011)	−1.188*** (0.253)	−0.0194* (0.009)
Longer than 10 years	−0.692 (0.436)	−0.0111 (0.012)	−0.477 (0.356)	−0.00924 (0.011)
N	3,398	3,398	3,398	3,398

Notes: Interest information for some loans was not reported in the 2016 Survey of Consumer Finances (SCF) data, therefore the total number of households was reduced from 4,481 to 3,398. The 2016 SCF sample weights were applied.

<sup>a</sup> “Weighted” means this interest rate measure takes the dollar amount weighted average of the interest rates across all loan types into account. That is, for each household, the dollar amounts of different loans are multiplied by their interest rates to calculate the overall liability cost per year. Then this liability cost is divided by the total loan amount to acquire the weighted average interest rate for each household.

<sup>b</sup> “Simple” means this interest measure is based on the simple arithmetic average of the interest rates across all loan types. This measurement serves as a robust check for the weighted average interest measure. Standard errors in parentheses.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

subject to higher interest rates. Therefore, families with these attributes are more likely to need help with liability management and could potentially benefit significantly from interest rate reductions.

Finally, we perform the alpha-equivalent analysis to determine the potential savings a household would experience if it were able to reduce the interest rates on their existing liabilities. For the analysis we assume the household's interest rates are reduced based on the distribution of household loan interest rates as noted in Fig. 3. We assume each liability would be reduced by some percentile amount, based on the distribution for that respective liability.

For example, let us assume a household had financial assets (i.e., a portfolio) worth \$100,000 and a single liability, which was \$15,000 in credit card debt at an interest rate of 15%. A 15% interest rate on credit card debt would be in the 47th percentile of interest rates according to Fig. 4. If the household were able to reduce the interest rate by ten percentile points, to the 37th percentile, the interest rate would decline to approximately 13%. This results in an interest savings of 2% ( $15\% - 13\% = 2\%$ ) that would translate into \$300 of total savings on the \$15,000 total credit card debt ( $\$15,000 \times 2\% = \$300$ ). If we divide the estimated \$300 in annual interest savings by the total financial assets, we can estimate the "alpha-equivalent" benefit associated with liability optimization, which would be 30 bps (basis points) in this case ( $\$300 / \$100,000 = 30$  bps).

We conduct this analysis for all households, where the rate on each loan is assumed to be reduced by some percentile level, based on the distribution of loan rates in Fig. 3. For the analysis the lowest possible rate is the 1st percentile. Information about the distribution of potential dollar savings and alpha-equivalent benefit are included in Fig. 6 in Panels A and B, respectively.

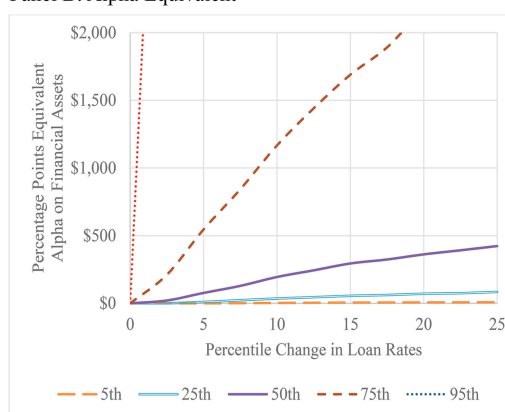
The potential savings associated with improving loan rates can be significant, especially for households that have higher interest percentiles. If a household's weighted average debt interest rate is currently in the 95th percentile, a five-percentile drop could generate 113.5% equivalent alpha, or \$1,641 in annual savings. If these households achieve a 10-percentile reduction in loan rates, the total savings would be \$2,614, which is equivalent to 237.5% of investment alpha. Even the median household stands to benefit from even modest improvements. For example, the median households would on average save \$410 if they were able to reduce their weighted average loan rates by 10 percentile points, which is equivalent to a 195 bps of investment alpha. This suggests that, for many households, making efforts to reduce the interest rates on their liabilities is more likely to result in wealth gains than attempting to construct portfolios that might outperform the market.

Notice that when calculating the potential savings on interest rate reductions, we use the weighted average interest rate in the discussion. Lowering the household average interest rate may be achieved in two different ways. First, households can make more efforts on interest rate shopping and negotiate lower interest rate on their loans, if possible. Second, even if directly lowering interest rates is not feasible, the weighted average interest rate can still be reduced through debt restructuring. Households can substitute a higher interest loan with lower interest borrowings to achieve the reductions of overall weighted average interest rates. (For example, consider a household with a large revolving balance on credit card loans who cannot reduce the total amount of household debt. This household could still potentially

Panel A: Dollar Amount



Panel B: Alpha Equivalent



Percentage Points Equivalent Alpha											
Change in Interest Rate Percentile											
Current Interest Rate Percentile	$\Delta 0$	$\Delta 2.5$	$\Delta 5$	$\Delta 7.5$	$\Delta 10$	$\Delta 12.5$	$\Delta 15$	$\Delta 17.5$	$\Delta 20$	$\Delta 22.5$	$\Delta 25$
5th	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.10%	0.10%	0.10%	0.10%
25th	0.00%	0.00%	0.10%	0.20%	0.40%	0.50%	0.60%	0.60%	0.70%	0.80%	0.80%
50th	0.00%	0.20%	0.80%	1.30%	1.90%	2.40%	2.90%	3.20%	3.60%	3.90%	4.20%
75th	0.00%	2.10%	5.50%	8.40%	11.70%	14.40%	16.90%	18.90%	21.70%	22.80%	24.70%
95th	0.00%	57.20%	113.50%	159.60%	237.50%	254.40%	302.80%	336.50%	382.20%	410.60%	455.40%
Dollar Equivalent Alpha											
Change in Interest Rate Percentile											
Current Interest Rate Percentile	$\Delta 0$	$\Delta 2.5$	$\Delta 5$	$\Delta 7.5$	$\Delta 10$	$\Delta 12.5$	$\Delta 15$	$\Delta 17.5$	$\Delta 20$	$\Delta 22.5$	$\Delta 25$
5th	\$0	\$0	\$0	\$4	\$7	\$12	\$14	\$17	\$20	\$21	\$23
25th	\$0	\$2	\$36	\$79	\$120	\$153	\$189	\$209	\$243	\$255	\$290
50th	\$0	\$56	\$175	\$270	\$410	\$488	\$580	\$652	\$763	\$824	\$889
75th	\$0	\$245	\$492	\$681	\$953	\$1,120	\$1,328	\$1,468	\$1,683	\$1,814	\$1,980
95th	\$0	\$960	\$1,641	\$2,053	\$2,614	\$2,952	\$3,409	\$3,785	\$4,278	\$4,443	\$4,840

Fig. 6. Benefit of reducing interest rates on debt. *Source:* Federal Reserve Board Survey of Consumer Finances (SCF) 2016 survey wave. *Notes:* The subsample is restricted to households that carry loans, reported complete data on all loan types, and have more than \$1 in financial assets. The number of observations is 3,371. The 2016 SCF sample weights were applied.

pay off this high interest rate credit card loan with low-interest secured-personal loans or some other type of loan. By doing so, the average interest rate of this household could be reduced, potentially significantly.)

The analyses above reveal the significant potential benefits of liability management and point out the characteristics that are associated with different households' debt problems. Financial planning practitioners and financial institutions can benefit from this research not only by recognizing the potential benefits of liability management for low-to-affluent American families, but also by identifying the attributes associated with those



households that most need debt assistance. This study can also encourage consumers to seek for an integrated approach to making decisions about their marginal income and benefit significantly from analyzing both sides of their balance sheet extensively and regularly.<sup>11</sup>

## **6. Conclusion and implications**

Debt is a significant and growing component of U.S. household balance sheets. With total interest rate payments on loans exceeding the expected returns on household financial assets for the average household, the impact of liability optimization should draw more focus from financial advisors, financial firms, and consumers. In this study, we first reviewed American families' current financial outlook by looking at their debt situations. Using the SCF data, we then analyzed the different economic, demographic, and behavioral factors that are associated with household borrowing and leverage ratios. Next, we separated the good and bad debts and investigated whether the attributes related to different debt categories are similar. After checking the characteristics demonstrated by the households that carry high-interest debts, we performed alpha-equivalent analyses to calculate the potential benefits of liability management.

Our study indicates that households with lower assets, income, and education levels need assistance the most and could significantly benefit from debt management. Households' time discounting preferences also play an important role in their borrowing decisions. Families with longer financial planning horizons are less likely to carry loans. Among the borrowers, a shorter financial planning horizon is usually an indicator of a higher debt amount as well as higher debt-to-asset and debt-to-income ratios. Families with myopic planning horizons are also more likely to carry a higher amount of bad debts, such as credit card balances.

This study can also inspire advisors and financial services firms to consider alternative approaches to helping consumers improve their financial well-being. For example, advisors could help their clients design a road map for debt restructuring and interest rate reduction along with building portfolio investment strategies. By reviewing both sides of the household balance sheet extensively and periodically, advisors can integrate both investment and liability management strategies to better improve their clients' economic outlooks. These strategies would be particularly effective for households with lower income, education, and asset levels.

Large retirement firms could explore the possibility of building a bridge between their retirement plan participants and lending institutions to help their participants gain access to loans with competitive rates. Participants could utilize these lower "group rate" loans to restructure and reduce the interest payments on their existing debts. Financial planners could also implement different behavior coaching strategies (such as behavioral nudging devices) to help their clients increase their financial planning horizons and avoid the consequences of myopic planning.



The integration of investment and liability management strategies prompts financial advisors to help their clients to answer the question, “Where should my next dollar go?” By designing a universal comparison mechanism between investing and paying off debt, financial advisors can help their customers to better manage their marginal income. An integrated model or strategy can be designed to not only educate the consumers on the importance of liability management, but also guide their decision-making process after taking each consumer’s unique financial situation into account. Future studies may find it favorable to build such an integrated methodology to help answer the age-old invest or pay off debt conundrum faced by many households.

## Notes

- 1 Defined as households with a net worth not exceeding \$1 million, have more than \$1,000 annual income and have at least \$1 in financial assets. High net worth households, defined as those with net worth over \$1 million, often have their own unique leveraging and investment strategies, and optimizing these special strategies is beyond the scope of this paper. Our definition of “low-to-affluent” households includes those in the middle-to-low income range because these households are most likely to need debt management assistance. Detailed descriptions of the analysis sample can be found in the data and methodology section of this article.
- 2 This is the lower end of average credit card and retail store installment card interest rates. Source: 2016 SCF data weighted average credit card interest rate for low-to-affluent households.
- 3 The definition of “good” and “bad” debts is discussed in both the literature review section and the results section.
- 4 The *Consumer Finance Monthly* study is conducted by the Consumer Finance Research Group at Ohio State University.
- 5 The utility function satisfies monotonicity (more is preferred to less) and concavity (diminishing marginal utility) properties and assumes  $c_t$ ’s are normal goods for every period  $t$ . The concavity property implies the preference of smoothing consumption across time because of the love of diversity.
- 6 The budget constraint depicted by Inequality (14) is derived from the following constraints while substituting out the borrowing factor  $s_t$  ( $\forall t$  from 1 to  $T$ ):

$$C_t + S_t \leq y_t \quad (11.1)$$

$$C_{t+1} \leq (1 + r) S_t + y_{t+1} \quad (11.2)$$

- 7 Given the prevalence of “payday lending” and other short-term loans in the United States (Caskey, 2001; Stegman, 2007), we assume that American households have access to sufficient amount of lending sources despite the fact that some of the loans may have unreasonably high interest rates. While we do not recommend consumers access these short-term loans, we use their potential access abilities of these loans to

simplify the model and transform the borrowing constraints to interest rate constraints. Another reason why we do not restrict the borrowing/saving factor  $s$  in the intertemporal consumption model is that this factor is canceled out when combining the two-period budget constraints together using substitutional method and Lagrangian technique to solve this intertemporal optimization problem.

- 8 The most current wave available at the time of the analysis.
- 9 The Survey of Consumer Finances uses “multiple imputation technique” to account for missing data. Because each missing value in the SCF is imputed five times, each SCF family has five separate observations (called “implicates”) in the final data.
- 10 The SCF data are derived from a dual-frame sample design, with one frame including households chosen via an area probability sample and the second frame including households selected from a list provided by the Internal Revenue Service. The second selection frame has introduced the problem of oversampling wealthy families (Nielsen, 2015).
- 11 Liability optimization includes debt restructuring, loan reduction, interest rate optimization, behavior coaching, etc. There are numerous complexities associated with liability optimization at the individual household level. The objective of this article is not focused on the detailed liability optimization approaches, rather to better understand which types of households have higher debts, in particular bad debts, and the potential benefits associated with reducing the interest on those debts.

## Appendix A

Sample balance sheet for the weighted mean value of the 2016 Survey of Consumer Finances households

		Assets		Sum total	Percent of population	Interest rate (estimated <sup>a</sup> )	Total annual earnings
Category	Sub-category	Sub-category detail	Amount				
Financial assets				\$73,122.13	98.29%		
	Transaction accounts (liquid)			\$13,590.40	97.75%	0.20%	\$27.18
	CDs			\$1,485.40	4.84%	0.96%	\$14.26
	Pooled investment funds			\$4,569.21	5.66%	5.61%	\$256.52
	Savings bonds			\$351.91	7.33%	2.62%	\$9.22
	Directly held stocks			\$2,791.27	9.20%	7.53%	\$210.13
	Directly held bonds			\$273.57	0.38%	3.70%	\$10.12
	Cash value of whole life insurance			\$2,746.16	17.23%	2.20%	\$60.42
	Other managed assets:			\$3,725.21	3.35%	4.10%	\$152.73
	Annuities		\$2,861.44				
	Trusts		\$863.77				
	Quasi-liquid retirement accounts			\$42,112.74	48.04%	4.00%	\$1,684.51
	Other misc. financial assets			\$1,476.26	8.29%	4.00%	\$59.05
Nonfinancial assets				\$159,244.50	89.76%		
	Vehicles (RVs, planes, boats, etc.)			\$17,982.83	84.47%		
	Primary residence			\$118,573.20	59.54%		
	Residential property excluding primary residence			\$11,071.96	9.12%		
	Net equity in nonresidential real estate			\$2,780.49	4.22%		
	Businesses			\$7,812.36	9.23%		
	Other misc. nonfinancial assets			\$1,023.67	4.92%		
Total assets				\$232,366.60	99.32%		
Net worth				\$156,181.85			
Total investment assets				\$73,122.12			\$2,484.13
Total financial assets less total debt				\$(3,062.63)			
Mortgages (including home equity loans, HELOCs)							
	Debt secured by primary residence:			\$53,249.90	40.67%		
	Mortgages and home equity loans secured by primary residence		\$51,818.03		39.27%	4.51%	\$2,336.99
	Home equity lines of credit secured by primary residence		\$1,431.87		3.59%	5.81%	\$83.19
	Debt secured by other residential property			\$3,875.32	3.87%	5.45%	\$211.20
	Other lines of credit (not secured by residential real estate)			\$143.90	1.80%	6.00%	\$8.63
Credit card balances after last payment				\$2,581.29	47.79%	15.09%	\$389.52
Installment loans				\$15,794.03	53.50%	16.27%	
	Education loans		\$8,390.03		24.69%	5.92%	\$496.69
	Vehicle loans		\$5,764.13		35.36%	6.63%	\$382.39
	Other installment loans		\$1,639.87		12.51%	6.00%	\$98.39

(continued on next page)

## Appendix A (Continued)

			Assets				
Category	Sub-category	Sub-category detail	Amount	Sum total	Percent of population	Interest rate (estimated <sup>a</sup> )	Total annual earnings
Other debt (e.g., loans against pensions or life insurance, margin loans)				\$540.31	5.35%	6.00%	\$32.42
Total debt				\$76,184.75	79.24%		\$4,039.43
Total asset return less total interest charges			\$(1,547.19)				
Financial asset to debt ratio							0.960

*Notes:* Sample weights applied. Number of households: 4,481; Net worth < \$1million; Income > \$1,000; Age: 20–85.

<sup>a</sup> Interest rate estimation sources:

CDs: FRED, Federal Reserve Bank of St. Louis. Averaged since 2008.

Pooled investment fund: Assumes 50% stocks and 50% bonds. Uses the average for mutual fund return.

Savings bonds: US Department of the Treasury, 10-Year High Quality Market (HQM) Corporate Bond Spot Rate [HQMCB10YR].

Directly held stocks: S&P 500 Return Calculator, with Dividend Reinvestment. (2019). Retrieved March 22, 2019.

Directly held bonds: US Department of the Treasury, 10-Year High Quality Market (HQM) Corporate Bond Spot Rate [HQMCB10YR]. Retrieved March 22, 2019, from FRED, Federal Reserve Bank of St. Louis.

## Appendix B

## Descriptive statistics of the analysis sample

Variable	Definition/explanations	Mean	SD	Min.	Max.
Have debt	(yes = 1, no = 0)	0.7924	0.4056	0	1
Debt amount	Dollar amount of total debt	\$76,185	\$117,866	\$0	\$2,630,000
Married	(yes = 1, no = 0)	0.5433	0.4981	0	1
Number of children in household	Total number of children in the household	0.7989	1.1334	0	7
Education level	Highest level of education completed according to the SCF standard categories <sup>a</sup>	9.2774	2.7128	0	14
Real assets	Total value of real assets <sup>b</sup>	\$150,409	\$185,257	\$0	\$2,282,900
Liquid assets	All types of transaction accounts <sup>c</sup>	\$13,590	\$32,926	\$0	\$572,000
Leverage ratio	Total debt/total asset	12.8096	462.9600	0	25,750
Own houses	(yes = 1, no = 0)	0.5954	0.4908	0	1
Have savings	Have more than \$0 in savings? (yes = 1, no = 0)	0.5043	0.5000	0	1
Race black	(yes = 1, no = 0)	0.1637	0.3700	0	1
Race Hispanic	(yes = 1, no = 0)	0.1140	0.3178	0	1
Race other	(yes = 1, no = 0)	0.1073	0.3095	0	1
Income	Household income in previous calendar year	\$62,321	\$59,020	\$1,013	\$2,531,591
Age	Age of the household head	49.6815	16.5849	20	85
Financial planning horizon	categorical variables <sup>d</sup>				
Next year	(yes = 1, no = 0)	0.1551	0.3620	0	1
Next few years	(yes = 1, no = 0)	0.2817	0.4498	0	1
Next 5 to 10 years	(yes = 1, no = 0)	0.2186	0.4133	0	1
Longer than 10 years	(yes = 1, no = 0)	0.1059	0.3077	0	1

Notes: Sample size is 4,481 households. Sample weights applied.

<sup>a</sup> 2016 Survey of Consumer Finances (SCF) codebook education level standard categories:

1. 1st, 2nd, 3rd, or 4th grade.
2. 5th or 6th grade.
3. 7th and 8th grade.
4. 9th grade.
5. 10th grade.
6. 11th grade.
7. 12th grade, no diploma.
8. High school graduate - high school diploma or equivalent.
9. Some college but no degree.
10. Associate degree in college - occupation/vocation program.
11. Associate degree in college - academic program.
12. Bachelor's degree (e.g., BA, AB, BS).
13. Master's degree (e.g., MA, MS, MENG, MED, MSW, MBA).
14. Professional school degree (e.g., MD, DDS, DVM, LLB, JD) and Doctorate degree (e.g., PHD, EDD).

<sup>b</sup> Real assets, according to the SCF Bulletin category definition, include: Houses, vehicles, residential properties excluding primary residence (e.g., vacation homes), and net equity in non-residential real estate.

<sup>c</sup> Liquid assets, according to the SCF Bulletin category definition, include: Money market accounts, checking accounts, savings accounts, call accounts, and prepaid cards.

<sup>d</sup> Original Survey Question from SCF codebook: "In planning or budgeting your (family's) saving and spending, which of the time periods listed on this page is most important to you (and your family living here)?"

### Appendix C

Ordinary least squares (OLS) regressions on factors associated with debt ratios (reduced sample)

Variables	OLS	OLS	OLS
	Debt-to-financial-asset ratio <sup>a</sup>	Debt-to-income ratio <sup>b</sup>	Debt-to-financial-asset ratio <sup>c</sup>
Married	−215.9 (244.237)	−0.357* (0.144)	21.86 (24.820)
Number of kids	168.7 (166.241)	−0.0148 (0.029)	6.673 (6.939)
Education level	−117.3** (44.613)	0.105*** (0.027)	1.151 (4.360)
Real assets (per \$10K)	8.508 (9.951)	0.0435*** (0.004)	0.342 (0.526)
Liquid assets (per \$10K)	13.88 (9.462)	−0.0343** (0.013)	−3.307** (1.085)
Have houses	−109.2 (323.537)	0.770*** (0.084)	60.14*** (16.643)
Have savings	−1142.8*** (198.107)	0.0345 (0.109)	−69.84*** (19.396)
Race Black	314.1 (373.679)	0.113 (0.077)	65.24 (54.015)
Race Hispanic	−168.1 (385.584)	0.108 (0.099)	19.05 (25.444)
Race other	−662.5** (237.327)	0.576* (0.275)	−1.861 (10.477)
Income (per \$10K)	−43.01 (22.350)	−0.120** (0.040)	−4.335 (2.696)
Age	−13.59** (4.997)	−0.0239*** (0.002)	−0.517 (0.292)
Financial planning horizon (omitted baseline category “next few months”)			
Next year	−1184.4** (379.501)	0.234 (0.198)	−48.46** (16.202)
Next few years	−917.7* (371.363)	−0.150* (0.071)	−4.372 (29.915)
Next 5 to 10 years	−1196.6*** (339.037)	−0.150 (0.086)	−52.28** (16.884)
Longer than 10 years	−752.0 (389.874)	−0.241* (0.120)	−54.19** (16.834)
N	3,561	3,561	3,495

Notes: <sup>a</sup> The analysis sample in this regression has been reduced and does not include the households whose total debt amount equals to zero. <sup>b</sup> The analysis sample in this regression only include the households whose total debt amount is greater than zero. <sup>c</sup> The analysis sample in this regression only include the households whose total debt amount is greater than zero. The analysis sample is further reduced by eliminating the households whose total financial assets is less than \$10.

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# Mobile bank applications: loyalty of young bank customers

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## Abstract

The purpose of this study is to investigate how young bank customers (YBCs) perceive the relationships between several antecedents (i.e., usability, responsiveness, customer satisfaction, and reliability) and loyalty in the context of mobile bank applications (MBAs). An electronic questionnaire was sent to 500 YBCs in Sweden, 146 of whom completed it. Confirmatory factor analysis was used to test the measurement model, and structural equation modeling was used to test the hypotheses. The results indicate that usability is indirectly related to loyalty through responsiveness and customer satisfaction. The study contributes to the literature by developing a usability–loyalty model of YBCs using MBAs. © 2021 Academy of Financial Services. All rights reserved.

*JEL classification:* M

*Keywords:* Usability; Customer satisfaction; Loyalty; Mobile bank application; Young bank customers

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## 1. Introduction

Studies in the literature on loyalty in the financial services context have indicated that while bank customers in general are loyal (e.g., Strandberg, Wahlberg, & Öhman, 2015), young bank customers (YBCs) are often not (Nicoletti, 2017). YBCs are twice as likely to change banks as are older bank customers (Accenture, 2015). Although YBCs represent an important customer category for traditional banks (Foscht, Maloles, Schloffer, Chia, & Sinha, 2010), members of this group show a tendency to use financial services provided by FinTech companies. Gomber, Kauffman, Parker, and Weber (2018) state that YBCs seem to

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prefer financial services provided by Google, Amazon, Apple, or Paypal, that is, FinTech companies, rather than by traditional banks. It has also been emphasized that “FinTech companies offer new products and solutions which fulfill customers’ needs that have previously not or not sufficiently been addressed by incumbent financial service providers [e.g., traditional banks].” (Gomber, Koch, & Siering, 2017, p. 540).

The ambition of FinTech companies to provide one-fifth of financial services by 2020 (Gimpel, Rau, & Röglinger, 2018) has led to competition between these companies and traditional banks, and YBCs seem to be the target of both these groups. Traditional banks have developed mobile bank applications (MBAs), that is, an advanced type of mobile banking. MBAs allow customers connected to the Internet to conduct various financial tasks, such as checking account balances, transferring money, and paying bills (Malaquias & Hwang, 2019). Simultaneously, the FinTech companies have promoted mobile-only banks (MOBs), a recent innovation that offers financial services to customers connected to the Internet solely via mobile applications (Nourallah, Strandberg, & Öhman, 2019).

One place where this rivalry between FinTech companies and banks is found is Sweden. In 2018, the first MOB, N26 launched mobile financial services, and in 2019, another MOB, Lunar Way announced that every month roughly 6,000 new customers subscribed to their services (Lundell, 2019).

The literature identifies several research gaps concerning the various antecedents of loyalty applicable to MBAs based on the perceptions of YBCs. In their review of the loyalty literature, Kandampully, Zhang, and Bilgihan (2015) highlight the mobile loyalty of the young generation as a future research area. In another review of the mobile banking literature, Tam and Oliveira (2017, p. 1060) state that “knowing the determinants of the postadoption phase, and keeping customers loyal to m-banking are the emerging issues that should be considered in future research.” Larsson and Viitaoja (2017) emphasize the need to investigate how usability affects loyalty. Another research area was summarized by Chakraborty and Sengupta (2013), who discuss the need to study the relationship between customer satisfaction and loyalty in the MBA context. Iberahim, Taufik, Adzmir, and Saharuddin (2016) investigate reliability and responsiveness in the automated teller machine (ATM) context, and suggest considering these concepts in other contexts as well. Addressing these research gaps, the current study investigates how YBCs perceive the relationships between a number of antecedents (i.e., usability, responsiveness, customer satisfaction, and reliability) and loyalty in the context of MBAs.

The structure of the rest of the article is as follows: the next section presents the frame of reference; section three concerns methodological issues; section four presents the results; and section five concludes the article.

## **2. Frame of reference and hypothesis development**

### *2.1. The context of the study*

#### *2.1.1. Mobile financial services*

Shaikh and Karjaluoto (2019) argue that mobile financial services can be divided into mobile banking, mobile payments, and mobile money. The first two types of mobile financial

services are found in more inclusive financial systems, for example, in Sweden, and are conducted with more inclusive customer segments, that is, customers who have access to banking services. The third service represents a relationship between a mobile money solution, such as M-Pesa, and nonbank customers. This service is common in less inclusive financial systems, for example, in Sub-Saharan Africa (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018), and in less inclusive customer segments, that is, customers who face difficulties (e.g., long distance) in accessing banking services.

Shaikh and Karjaluoto (2019) examine the landscape of mobile financial services, giving insight into the types of relationships between more or less inclusive financial systems and more or less inclusive customer segments. However, they do not differentiate between the types of financial institutions that offer mobile financial services, that is, traditional banks and FinTech companies. Shaikh and Karjaluoto (2019) use mobile banking to refer to various types of mobile financial services, including mobile banking provided by traditional banks. Because mobile banking does not represent a homogeneous type, it can be divided into services provided by wireless application protocol (WAP), short message service (SMS), and MBAs.

It is worth noting that WAP and SMS banking represent earlier versions of mobile banking in which bank customers access their bank accounts via either a mobile Internet browser or SMS. These rudimentary types of mobile banking prompted remarkable customer aversion. For example, during the 2003–2006 period, 15 German banks stopped offering such services to customers due to lack of use (Scornavacca & Hoehle, 2007).<sup>1</sup> In South Korea, only 4% of online customers adopted these earlier versions of mobile banking in that period (Lee, Park, Chung, and Blakeney, 2012). Moreover, “in 2003 . . . less than 1% of banking transactions in Taiwan were conducted through mobile handsets” (Luarn & Lin, 2005, p. 874). Similar situations existed in Finland (Suoranta & Mattila, 2004), China (Laforet & Li, 2005), and the United States (Mallat, Rossi, & Tuunainen, 2004).

Earlier versions of mobile banking were not as widespread as expected (Koenig-Lewis, Palmer, & Moll, 2010; Mohammadi, 2015; Shaikh & Karjaluoto, 2015). Mobile banking system limitations, such as tiny screens and keypads and slower transaction speeds, caused this aversion (Laukkanen, 2007; Lee & Chung, 2009). However, since 2007—after the first iPhone was launched (Shaikh & Karjaluoto, 2019)—the situation changed dramatically and MBAs have become a basic means of conducting daily financial transactions such as checking balances, transferring money, and paying bills (Liébana-Cabanillas, Alonso-Dos-Santos, Soto-Fuentes, & Valderrama-Palma, 2017; Tan & Lau, 2016). This change likely emerged due to greater accessibility to the Internet (Lu, Tzeng, Cheng, & Hsu, 2015), advanced generations of smartphones (Shaikh & Karjaluoto, 2015), and the development of application technology (Sun, Wang, & Wang, 2015).

### *2.1.2. Young bank customers*

Young customers are more enthusiastic about using their mobile phones than are members of other age groups (Yeh, Wang, & Yieh, 2016), and they have advanced skills in dealing with various technological financial platforms (Killins, 2017). They also spend

significant amounts of time using these platforms (Kaur & Medury, 2011). It is worth noting that reaching YBCs is a top priority for banks (Tan & Lau, 2016).

Recent studies recommend investigating bank customers, such as YBCs, who possess limited financial information (Aydin & Akben Selcuk, 2019). Moreover, YBCs will seek home mortgages and other financial services in the near future, so it is important for banks to secure loyal YBCs, given that FinTech companies will be the main providers of financial services (Gimpel et al., 2018) and that these companies can satisfy customers in other and possibly better ways than can traditional banks (Gomber et al., 2017). YBCs can contribute to increased bank profits in terms of immediate profits, future profitability, market share, and diverse profitable relationships (Foscht et al., 2010).

The literature reveals that different terms have been used interchangeably to refer to YBCs: the millennial generation (e.g., Tan & Lau, 2016), the young generation (e.g., Koenig-Lewis et al., 2010), and generation Y (Killins, 2017). Also, previous studies have used different age groups when investigating YBCs. Calisir and Gumussoy (2008) use the 18–26-year age range, Sum Chau and Ngai (2010) 16–29 years, and Akturan and Tezcan (2012) 16–25 years. In this study, YBCs are bank customers aged 18–29 years, that is, the interval from first being considered “adult” in Sweden to the highest year considered in the three studies mentioned above.

## *2.2. Conceptual framework*

### *2.2.1. Central concepts*

Electronic financial services refer to accessing a bank account via computers and/or mobile financial services (Shaikh & Karjaluo, 2019). In this context, studies have addressed responsiveness and reliability (Broderick & Vachirapornpuk, 2002), customer satisfaction (Sampaio, Ladeira, & Santini, 2017), and loyalty (Larsson & Viitaoja, 2017). Overall, studies report that customer satisfaction and loyalty are the most important factors delivering a good experience (Berraies, Yahia, & Hannachi, 2017), while reliability is identified as a necessary risk-related factor in technology-based financial services (Hanafizadeh, Behboudi, Koshksaray, & Tabar, 2014). In a similar vein, Sindwani and Goel (2015) argue that responsiveness is an important concept in the electronic financial services context.

A number of previous studies have addressed usability-related issues (e.g., Mohammadi, 2015). The International Organization for Standardization (IOS, 1998) defines usability as “the extent to which a product can be used by specified users to achieve specified goals.” Kang, Lee, and Lee (2012) state that MBA usability likely concerns mobile interface and navigation issues. Casaló, Flavian, and Guinalú (2007, 2008) and Flavian, Guinalú, and Gurrea (2006) find that in the banking industry, the essence of usability is represented by ease of understanding, observed content, simplicity, speed, ease of site navigation, and user control.

From an electronic financial services perspective, customer satisfaction is created by meeting customer expectations regarding financial issues (Amin, 2016), while loyalty is seen as a dichotomy between attitude and behavior. Attitudinal loyalty includes “a degree of

dispositional commitment, in terms of some unique value associated with the brand” (Lin & Wang, 2006, p. 272), and behavioral loyalty refers to a customer’s repurchase behavior, due to their liking for particular financial services (Amin, 2016).

It is worth mentioning that most previous studies of service quality have used the SERVQUAL instrument (Parasuraman, Zeithaml, & Berry, 1988), which consists of five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The current study excludes three of these dimensions: tangibles, assurance, and empathy. Parasuraman et al. (1998, p. 23) state that tangibles are “physical facilities, equipment, and appearance of personnel,” assurance is the “knowledge and courtesy of employees and their ability to inspire trust and confidence,” and empathy is “caring, individualized attention the firm provides its customers.” It can be argued that these dimensions are related to the customer–employee relationship dimension, which is not part of the MBA context. Hence, the current study only uses the responsiveness and reliability dimensions of service quality, since MBAs have evolved in an environment in which the nature of mobile–human interaction differs from personal interaction (Oliveira, Thomas, Baptista, & Campos, 2016), and because YBCs do not prefer personal connections when accessing banking services (Carlander, Gamble, Gärling, Hauff, Johansson, & Holmen, 2018). In this regard, responsiveness is the willingness to help consumers and provide prompt service (Parasuraman et al., 1988), and in terms of MBAs, it has two components: service speed and technology (Iberahim et al., 2016). Reliability is defined as “the ability to perform the promised service dependably and accurately” (Parasuraman et al., 1988, p. 23). The current study adopts these definitions.

### 2.2.2. *The research model and hypotheses*

The research model is presented in Fig. 1. As can be seen, the literature suggests that usability is related to responsiveness, customer satisfaction, and reliability, as indicated by H1, H2, and H3. Subsequently, responsiveness and reliability are related to customer satisfaction, as indicated by H4 and H5. Finally, these three concepts are related to loyalty, as indicated by H6, H7, and H8. The eight hypotheses are developed below.

In the banking sector, usability will likely enhance speed, ease site navigation, and increase user control (Casaló et al., 2007, 2008; Flavian et al., 2006). Usability can offer various benefits to customers (Calisir & Gumussoy, 2008), such as the ability to get banking help in various critical situations (Gumussoy, 2016), to access a user-friendly system (Hussien & Aziz, 2013), and to use a variety of communication channels (Laukkanen, 2007). Offering a high level of usability will likely lead to good responsiveness (Raza, Jawaid, & Hassan, 2015). Accordingly, this study proposes the following hypothesis in the MBA context:

*Hypothesis 1 (H1):* The higher the usability, the higher the responsiveness is likely to be.

Generally, usability can lead to a pleasant user experience (Nielsen, 1994), affect customer expectations (Bhattacharjee, 2001), and ensure customer satisfaction. Theoretical arguments and empirical results have emphasized the importance of usability for customer decisions to use certain technological applications (e.g., Hoehle & Venkatesh, 2015). In the online banking context, empirical results indicate that usability can significantly affect

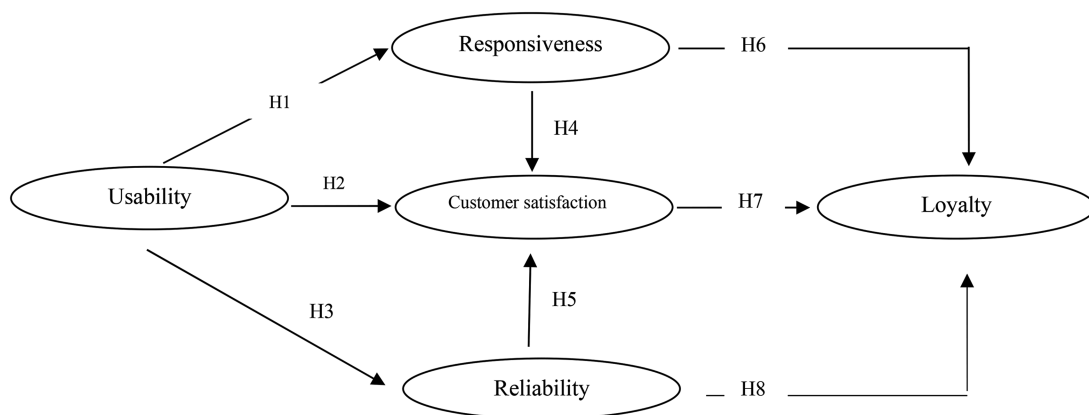


Fig. 1. Research model.

customer satisfaction (Casaló et al., 2008; Flavian et al., 2006; Hussien & Aziz, 2013). Similarly, Thakur (2014), when studying MBAs in India, finds that usability affects customer satisfaction. The following hypothesis is accordingly formulated:

*Hypothesis 2 (H2):* The higher the usability, the higher the customer satisfaction is likely to be.

Usability is also considered a key factor in e-business success (Lee & Kozar, 2012), and high usability ensures fewer difficulties in using a certain system (Davis, 1989), promotes ease of use of that system (Nielsen, 1994), and reduces possible errors (Sanchez-Franco & Rondan-Cataluña, 2010). In contrast, low usability generates payment-related issues (Flavian et al., 2006). Since high MBA usability ensures trustworthy financial services in terms of transferring money, obtaining account information, and paying bills (Mohammadi, 2015), it can be argued that usability drives reliability (cf. Benlian & Hess, 2011). Hence, it is hypothesized that:

*Hypothesis 3 (H3):* The higher the usability, the higher the reliability is likely to be.

Responsiveness is the ability to provide help and instant services to customers, that is, provide fast replies regarding their bank accounts (Raza et al., 2015), in turn increasing the customer satisfaction (Iberahim et al., 2016). Previous studies in the banking sector have presented contrasting observations about this relationship. While Raza et al. (2015) and Saleem, Zahra, Ahmad, and Ismail (2016) state that there is a significant relationship between responsiveness and customer satisfaction, other studies (Kassim & Asiah Abdullah, 2010; Munusamy, Chelliah, & Mun, 2010) report contrary results. Based on theoretical assumptions and more recent empirical studies, the current study suggests the following hypothesis:

*Hypothesis 4 (H4):* The higher the responsiveness, the higher the customer satisfaction is likely to be.

Bauer, Falk, and Hammerschmidt (2006) conclude that reliability is the most critical factor driving customer satisfaction. In investigating reliability in mobile payment services, Arvidsson (2014) finds that consumers highly rate the importance of reliability. Similarly, Calisir and Gumussoy (2008) emphasize the role of reliability in banking, and Raza et al. (2015) demonstrate that reliability has a considerable effect on customer satisfaction. Munusamy et al. (2010) investigate this relationship in the banking sector in Malaysia and



report no significant relationship, and Wen and Hilmi (2011) find the same lack of relationship in another Malaysian study. Overall, the results reported by most of the above studies lead to the following hypothesis:

*Hypothesis 5 (H5):* The higher the reliability, the higher the customer satisfaction is likely to be.

Quick responses to customer questions are seen as a factor leading to customer loyalty (Srinivasan, Anderson, & Ponnnavolu, 2002). Loyalty can be ensured by offering a variety of communication channels (Verhoef & Donkers, 2005) and by providing embedded ways to ask for help (Awwad & Awad Neimat, 2010). Previous studies report that responsiveness could well affect loyalty (Marimon, Yaya, & Casadesus Fa, 2012; Moorthy, Chee, Yi, Ying, Woen, & Wei, 2017). In a study of mobile commerce, Lin (2012) finds a significant relationship between responsiveness and loyalty. This leads to the following hypothesis:

*Hypothesis 6 (H6):* The higher the responsiveness, the higher the loyalty is likely to be.

Customer satisfaction is an important issue for any company (Santouridis & Trivellas, 2010), and banks are no exception. It explains post-purchase perceived performance (Fornell, 1992) and ensures customer retention and profitability (Strandberg, Wahlberg, & Öhman, 2012). Previous studies report a strong relationship between customer satisfaction and loyalty (Lin & Wang, 2006; Liébana-Cabanillas et al., 2017; Thakur, 2014). Fornell (1992, p. 7) describes this relationship as follows: “Loyal customers are not necessarily satisfied customers, but satisfied customers tend to be loyal customers.” The current study emphasizes this relationship, and formulates the following hypothesis:

*Hypothesis 7 (H7):* The higher the customer satisfaction, the higher the loyalty is likely to be.

Reliability enhances the ability of MBAs to perform the promised customer services dependably and accurately (Jun & Palacios, 2016). Previous studies have investigated reliability as a dimension of service quality, and empirical results support the relationship between reliability and loyalty (e.g., Karatepe, 2011). Other studies of reliability have reached similar conclusions. Ho and Lee (2007) suggest that reliability is a crucial factor for retaining customers, and Moorthy et al. (2017) conclude that reliability is significantly and positively related to loyalty. However, in mobile retailing, Lin (2012) finds no relationship between reliability and loyalty. In a similar vein, Zhou, Lu, and Wang (2010) suggest that reliability might not be as important for YBCs as for older bank customers. Nevertheless, the following hypothesis is based on most previous research:

*Hypothesis 8 (H8):* The higher the reliability, the higher the loyalty is likely to be.

### 3. Method

#### 3.1. Measure development

The items in the preliminary questionnaire were adopted from previous studies to ensure content validity (see the Appendix). Usability was measured by items (Usa 1–5) from



Casaló et al. (2008). Responsiveness items (Res 1–3) and reliability items (Rel 1–3) were adopted from Lin (2013). Customer satisfaction items (Sat 1–2) were adopted from Aydin and Özer (2005) and Yoon (2010), and loyalty items (Loy 1–2) from Chaudhuri and Holbrook (2001) and Wirtz, Mattila, and Lwin (2007). Two focus group interviews were conducted with four and five YBCs, respectively. All participants belonged to the target age group, that is, 18–29 years, and had at least one year's experience of MBA use in Sweden. The focus group interviews contributed to the detailed improvement of some items in the preliminary questionnaire. Back translation was conducted to ensure that the items had good consistency (cf. Brislin, 1970), and certain language-related revisions were made as a result. The last step was to send the preliminary questionnaire to two experienced YBCs to check for readability, and minor revisions were made based on their feedback. The final questionnaire was based on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. The background variables included were age, gender, and MBA experience.

### *3.2. Sample, data collection, and data analysis procedures*

The final questionnaire was sent in electronic form to 500 students at a university in the Mid-Sweden region in late 2018. These students studied business administration, political science, or sociology, were aged 18–29 years, and differed in the MBA usage duration and the number of MBAs used. In addition, the students were diverse in terms of socioeconomic class, gender, and cultural background. The main criterion for selecting these students was use of MBAs for at least one year, which requires a Swedish bank account. Sampling university students enabled the current study to avoid limitations related to a sample associated with a single bank (e.g., Strandberg et al., 2012), because the present respondents were customers of several banks.

Harm to participants, confidentiality of information provided, confidentiality of collected data, and data-storage issues were among the ethical concerns of the current study, and certain processes were used to address these concerns and the general limitations associated with questionnaires (cf. Grinyer, 2009). Approval to send out the questionnaire was obtained from responsible persons at the university program and course levels. Brief information about the study was presented to the students, including advising that completing the questionnaire was voluntary and that financial information would not be gathered for the study. The anonymity of responses was ensured by using online software complying with the EU's General Data Protection Regulation.

Initially, 129 completed questionnaires were received; after two reminders, the total number of completed questionnaires increased to 146, that is, a response rate of 29.2%. Following the suggestion of Pohlmann (2004), an analysis was conducted comparing the results of those responding before and after the first reminder; no notable differences were found between these two groups.

Descriptive statistics, sample adequacy, and common method bias tests were calculated. In a further step, confirmatory factor analysis (CFA) was utilized to test how well the observed variables represent the latent variables (cf. Hair, Black, Babin, & Anderson, 2014). The current study used CFA to delete unnecessary items and refine the measurement model; it was also used to address reliability and validity issues. Subsequently, structural equation

modeling (SEM) was used to test the research model and the hypotheses. Both CFA and SEM were performed using LISREL 9.30.

## 4. Results

### 4.1. Descriptive statistics

The characteristics of the sample are presented in the Appendix. Most participants were 18–23 years of age, and the sample was fairly equally distributed in terms of gender. Only a small percentage of participants used more than three MBAs. Regarding usage experience, a large majority had two or more years of MBA experience, and almost half the participants perceived themselves as highly experienced.

### 4.2. Sample adequacy and common method bias

Exploratory factor analysis was used to assess sample adequacy and common method bias. Kaiser-Meyer-Olkin (KMO; cf. Sharma, 1996) and Harmon's single-factor tests (cf. Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) were conducted. The KMO value was 0.809 ( $KMO > 0.8$ ), indicating that the sample adequacy is good. Harmon's single-factor test showed that there was no maximum variance explained by a single factor

### 4.3. Measurement model

The initial results of the measurement model, that is, the model that contains all the items included in the research model, did not meet the suggested thresholds. To refine the model, the suggestions of the modification indices in LISREL 9.30 were applied (cf. Jöreskog & Sörbom, 1993). This resulted in three factors (i.e., Usa 4, Usa 5, and Rel 3) being eliminated. The results of the final measurement model with standardized factor loadings and  $t$ -values are presented in Fig. 2. Observed variables are represented by rectangles; the standardized factor loading values are indicated before the slashes and the  $t$ -values after the slashes.

The final measurement model shows that  $\chi^2 = 55.07$  (with 44 degrees of freedom). The  $\chi^2/df$  ratio equals 1.25 ( $\chi^2/df > 2$ ), which is considered a good fit (cf. Jöreskog, Olsson, & Wallentin, 2016). The root mean square error of approximation (RMSEA) is 0.0428 ( $RMSEA > 0.8$ ), which indicates good fit (cf. Bagozzi & Yi, 1988). The results of the goodness of fit index, normed fit index, non-normed fit index, and comparative fit index were all  $> 0.9$ , which is the recommended threshold (cf. Jöreskog et al., 2016). Table 1 shows that the overall fit indices of the measurement model meet the recommended values.

CFA was used to measure the reliability, convergent validity, and discriminant validity of the measurement model. The current study uses two tests to assess reliability: (1) squared multiple correlations (SMC), that is, the degree to which the observed variable's variance is

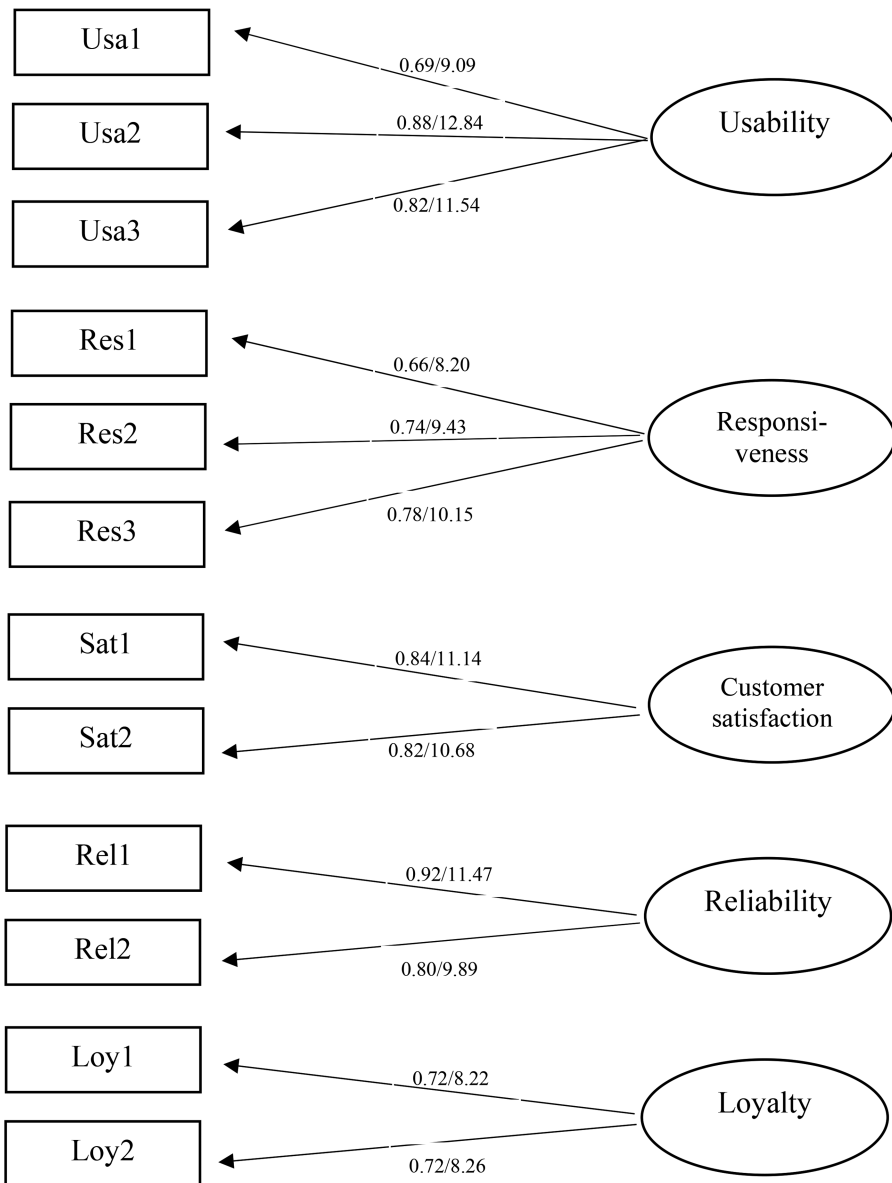


Fig. 2. The results of the measurement model with standardized factor loadings and  $t$ -values.  $\chi^2 = 55.07$ ,  $p$ -value = 0.12243, RMSEA = 0.042; RMSEA = root mean square error of approximation.

explained by a latent variable, and (2) composite reliability (CR), to assess the internal consistency (Hair et al., 2014). CR was calculated from the squared sum of factor loadings ( $L_i$ ) for each latent variable and for the sum of the error variance terms for the latent variables, as shown in Eq. (1). Table 2 shows that the SMCs of all observed variables are higher than 0.5, except for Usa 1 and Res 1, which are below the cutoff value. Table 2 indicates that the CR values are above 0.6 for all latent variables.

Table 1 The fit indices of the measurement model

Fit indices	Result
$\chi^2/df$	1.25
Root mean square error of approximation (RMSEA)	0.042
Goodness of fit index (GFI)	0.942
Normed fit index (NFI)	0.943
Non-normed fit index (NNFI)	0.978
Comparative fit index (CFI)	0.986

$$CR = \frac{\left(\sum_{i=1}^n L_i\right)^2}{\left(\sum_{i=1}^n L_i\right)^2 + \left(\sum_{i=1}^n e_i\right)} \tag{1}$$

To assess convergent validity, this study used the average variance extracted (AVE), standardized factor loadings, and *t*-values. AVE was computed from the mean variance of the item loadings on a latent variable, as shown in Eq. (2):

$$AVE = \frac{\sum_{i=1}^n L_i^2}{n} \tag{2}$$

In Table 2, the computations indicate that AVE is above 0.5 and that all standardized factor loadings exceed 0.6 (cf. Hair et al., 2014). All the *t*-values are significant.

To assess discriminant validity, a confidence interval of  $\pm 2$  standard errors around the standardized correlations between latent variables was calculated based on LISREL output (cf. Hansen, Samuelsen, & Sallis, 2013). The calculations indicated that the confidence interval was within the acceptable range, that is, not more than 1 or less than  $-1$ .

The measurement purification was confirmed by the good results of assessing the goodness of fit (cf. Jöreskog et al., 2016) and by the reliability and validity of the variables (cf. Fornell & Larcker, 1981). Overall, it can be assumed that the reliability (cf. Bagozzi & Yi, 1988; Hair et al., 2014), convergent validity, and discriminant validity are good (cf. Fornell & Larcker, 1981).

4.4. Testing the research model

SEM was performed using LISREL 9.30 (using maximum likelihood and covariance matrices) to test whether the empirical data support the research model. All fit indices correspond to the recommended values (cf. Jöreskog et al., 2016). The calculations indicate that there are five significant relationships ( $p < .01$ ), while three hypotheses are not supported.

Table 2 Standardized factor loading, *t*-value, SMC, AVE, and CR for the measurement model

Latent variables	Observed variables	Standardized factor loading	<i>t</i> -value	SMC	AVE	CR
Usability	Usa 1	0.69	9.09	0.48	0.64	0.84
	Usa 2	0.88	12.84	0.78		
	Usa 3	0.82	11.54	0.68		
Responsiveness	Res 1	0.66	8.20	0.44	0.74	0.85
	Res 2	0.74	9.43	0.55		
	Res 3	0.78	10.15	0.62		
Customer satisfaction	Sat 1	0.84	11.14	0.72	0.69	0.82
	Sat 2	0.82	10.68	0.63		
Reliability	Rel 1	0.92	11.47	0.84	0.53	0.77
	Rel 2	0.80	9.89	0.64		
Loyalty	Loy 1	0.72	8.22	0.51	0.52	0.68
	Loy 2	0.72	8.26	0.53		

Note: SMC = squared multiple correlations; AVE = average variance extended; CR = composite reliability.

Table 3 presents the standardized loadings, *t*-values, hypothesis outcomes, and fit indices of the model.

The structural model shows that usability is directly related to responsiveness (in line with H1) and customer satisfaction (in line with H2), and that responsiveness and customer satisfaction are directly related to loyalty (in line with H6 and H7, respectively). In this sense, an indirect relationship appears between usability and loyalty (see Fig. 3).

It should be mentioned that there is a direct relationship between usability and reliability (in line with H3), but not between reliability and loyalty (in contrast to H8). In contrast to H4, there is no relationship between responsiveness and customer satisfaction, and in contrast to H5, there is no relationship between reliability and customer satisfaction.

Table 3 Structural model results

Hypothesis		Standardized loading	<i>t</i> -Value	Outcome
H1	Usability → Responsiveness	0.70	6.26*	Supported
H2	Usability → Customer satisfaction	0.49	3.22*	Supported
H3	Usability → Reliability	0.58	6.49*	Supported
H4	Responsiveness → Customer satisfaction	0.13	0.98	Not supported
H5	Reliability → Customer satisfaction	0.16	1.57	Not supported
H6	Responsiveness → Loyalty	0.44	3.27*	Supported
H7	Customer satisfaction → Loyalty	0.37	2.77*	Supported
H8	Reliability → Loyalty	0.37	0.28	Not supported
$\chi^2/df = 1.21$ , RMSEA = 0.038, $p = .15$ , GFI = 0.942, NFI = 0.933, NNFI = 0.982, CFI = 0.987				

Note: RMSEA = root mean square error of approximation; GFI = goodness of fit index; NFI = normed fit index; NNFI = non-normed fit index; CFI = comparative fit index.

\* $p$ -value < 0.01.

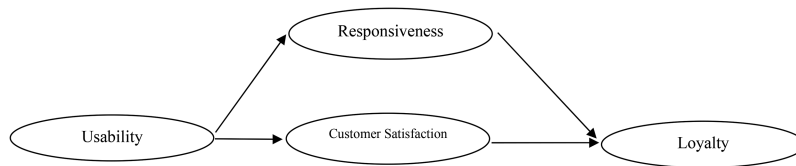


Fig. 3. Usability–loyalty model of young bank customers (YBCs) on mobile bank applications (MBAs).

## 5. Discussion

### 5.1. Conclusion

This study investigates how YBCs perceive the relationships between the usability, responsiveness, customer satisfaction, and reliability antecedents and loyalty in the context of MBAs. Based on the empirical results, it can be argued that usability has a direct relationship with responsiveness, customer satisfaction, and reliability and an indirect relationship with loyalty via responsiveness and customer satisfaction. The finding that usability has an indirect relationship with loyalty through customer satisfaction is in line with the findings of Casaló et al. (2008) and Flavian et al. (2006).

Responsiveness is significantly related to loyalty, but not to customer satisfaction. The latter finding was not as hypothesized, but is in line with the findings of Kassim and Asiah Abdullah (2010) and Munusamy et al. (2010). These results draw attention to the argument of Fornell (1992, p. 7) that “loyal customers are not necessarily satisfied customers.” As a consequence, the lack of relationship between responsiveness and customer satisfaction might cause MBAs to lose YBCs in the long term.

Several previous studies (Arvidsson, 2014; Bauer et al., 2006; Calisir & Gumussoy, 2008; Raza et al., 2015) find a significant relationship between reliability and customer satisfaction. However, as in the studies of Munusamy et al. (2010) and Wen and Hilmi (2011), our empirical results do not significantly support this relationship, calling into question whether reliable MBAs can increase the satisfaction of YBCs. This lack of relationship could be attributable to YBCs’ perceptions of reliability in the MBA context, and to YBCs’ search for more than just a reliable MBA, for example, a usable one. Previous studies have stressed that reliability might not be as important for YBCs as for older bank customers (Zhou et al., 2010). This also corresponds to our finding that no significant relationship exists between reliability and loyalty, which is in line with the conclusion of Lin (2012), who find the same lack of relationship in mobile retailing. It is also possible that the two dimensions of SERVQUAL used here, that is, responsiveness and reliability, have different roles regarding YBC experience of MBAs.

It was no surprise to find a significant relationship between customer satisfaction and loyalty in the MBA context. The more satisfied YBCs are, the more loyal they could be. It is claimed that YBCs, who will likely be significant for the future of financial services, prefer FinTech companies (Gomber et al., 2018) and tend to change banks more than any other age group (Accenture, 2015). The exclusive offering of financial services in traditional banks will likely weaken due to the attempts of FinTech companies to offer and promote improved

services (Nicoletti, 2017). Therefore, cultivating the loyalty of YBCs is considered a top priority for traditional banks.

### *5.2. Theoretical and practical implications*

The present findings have theoretical as well as practical implications. Compared with previous studies in the banking sector that highlighted service quality as a key to customer satisfaction and loyalty (e.g., Kassim & Asiah Abdullah, 2010; Santouridis & Trivellas, 2010), we argue that in today's digital world, usability can also ensure satisfied and loyal customers. In other words, it can be concluded that the higher the usability a certain MBA offers, the more satisfied YBCs will be. This is of interest because our empirical findings regarding YBCs' perceptions in the MBA context demonstrate that both responsiveness and customer satisfaction are directly related to loyalty.

Usability is a relatively unstudied phenomenon in the financial services context, but the rise of FinTech has drawn attention to investigations of usability-related issues. Previous studies have acknowledged both ease of use and usefulness (Mohammadi, 2015), and financial services studies such as those of Casaló et al. (2007, 2008) and Flavian et al. (2006) suggest that ease of use is likely the proper way to articulate usability. The current study is in line with this suggestion, because ease of use was found to represent a single usability construct.

That banks have made the largest information technology (IT) investments across all industries (Puschmann, 2017) means that IT-related costs represent a significant percentage of bank expenditures. The results of the current study might be used to prioritize such IT investments, especially those related to usability, because three usability attributes were found to be particularly important: it should be (1) easy to use the MBA the first time, (2) easy to find information, and (3) easy to navigate the MBA.

Mobile application technology represents a promising opportunity for traditional banks and FinTech companies, because a mobile application can be an independent financial service provider, for example, an MOB. This is unique compared with the earlier versions of mobile banking. Traditional banks need to take this development into consideration because YBCs can easily move to other types of financial service providers.

### *5.3. Limitations and future research*

Some limitations of this study can be seen as potential areas for future research. The study was conducted in a specific country and the number of responses was limited. It is therefore suggested that cross-cultural studies be conducted in the future, as cultural differences represent a crucial factor in the banking sector, and that more respondents be included. Additional studies are also important because of the general limitations of questionnaire research (cf. Sharma & Sidhu, 2001), including social desirability bias when data are self-reported and the risk of measuring respondents' recalled rather than "lived" perceptions. Another suggestion is accordingly to conduct "big data" studies focusing on text conversations in social media.



Raza et al. (2015) find that reliability is related to customer satisfaction, which was not supported by the current study. A suggested area for future studies would accordingly be to explore additional aspects of reliability in the MBA context. It is also recommended that further studies should cover related issues such as privacy and security.

## Notes

- 1 Including four large private banks: Deutsche Bank, Dresdner Bank, Hypoverein Bank, and Commerzbank.
- 2 Since some respondents use more than one MBA, the original questionnaire asked those to answer Part II based on their experience on the main MBA they use.

## The Appendix: The final questionnaire

Part I. Background including demographic variables			
Variables	Frequency (number)	Frequency (%)	Cumulative (%)
Age			
18–23 years	105	71.9%	71.9%
24–29 years	41	28.1%	100%
Total	146	100%	
Gender			
Male	63	43.1%	43.1%
Female	81	55.5%	98.6%
Prefer not to say	2	1.4%	100%
Total	146	100%	
How many MBAs do you use?			
1	55	37.7%	37.7%
2	42	28.7%	66.4%
3	40	27.4%	93.8%
4 or more	9	6.2%	100%
Total	146	100%	
How long have you used MBAs?			
1 year–under 2 years	14	9.6%	9.6%
2 years–under 3 years	33	22.6%	32.2%
3 years–under 4 years	35	23.9%	56.1%
4 years or more	64	43.9%	100%
Total	146	100%	
Part II. Usability, responsiveness, customer satisfaction, reliability, and loyalty <sup>2</sup>			
Usability			
Usa 1	It was easy to use the MBA when I used it for the first time.	Casaló et al. (2008)	
Usa 2	It is easy to find the information I need from the MBA.		
Usa 3	It is easy to navigate in the MBA.		
Usa 4	It is easy to carry out transactions in the MBA.		
Usa 5	Transactions can be carried out quickly in the MBA.		
Responsiveness			
Res 1	The MBA responds quickly to my questions.	Lin (2013) and	
Res 2	The different communication channels in the MBA help me to solve my problems.	Malaquias and Hwang (2019)	
Res 3	The MBA provides opportunities to ask for help.		
Customer satisfaction			
Sat 1	The MBA always meets my expectations.	Aydin and Özer	
Sat 2	I am very pleased with the MBA.	(2005)	
Reliability			
Rel 1	It is reliable to transfer money in the MBA.	Lin (2013)	
Rel 2	I can trust that the account information in the MBA is correct.		
Rel 3	It is reliable to pay bills in the MBA.		
Loyalty			
Loy 1	I am committed to the MBA.	Chaudhuri and Holbrook (2001)	
Loy 2	I carry out all my banking transactions via the MBA.	Wirtz et al. (2007)	

*Note:* MBA = mobile bank applications.

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# CE

## 1-hour general principles of financial planning, risk and insurance planning, and estate planning

AFS and FPA members can earn CE credits through *Financial Services Review*. Go to [FPAJournal.org](http://FPAJournal.org).

To receive one hour of continuing education credit allotted for this exam, you must answer four out of five questions correctly. CFP Board recently adopted revisions to several provisions of its CE policies, including changing the minimum number of questions for self-study assessments from 10 to 5 per full CE credit hour. Therefore, *Financial Services Review* CE exams will have 5 questions. CE credit for this issue expires **May 31, 2023**, subject to any changes dictated by CFP Board. AFS and FPA offer *Financial Services Review* CE online only—paper continuing education will not be processed. Go to [FPAJournal.org](http://FPAJournal.org) to take current and past CE (free to AFS and FPA members). You may use this page for reference. Please allow 2-3 weeks for credit to be processed and reported to CFP Board.

1. In “The Potential Benefit of Liability Management” by Liu and Blanchett, which of the following factors are positively related to U.S. households carrying debt:
  - a. Number of household children.
  - b. Home ownership.
  - c. Education level.
  - d. All of the above.
2. Liu and Blanchett concluded that households with longer financial planning horizons are:
  - a. More likely to have debts.
  - b. Much less likely to have debts.
  - c. In the similar debt situation compared to the households with short financial planning horizons.
  - d. None of the above.
3. According to Liu and Blanchett, bad debts are not only expensive, but they may also:
  - a. Negatively influence the borrowers’ credit scores.
  - b. Hinder their financial and retirement goals.
  - c. Cause stress and health issues.
  - d. All of the above.
4. According to “Encouraging Living Will Completion Using Social Norms and Family Benefit” by Hussein and James, which of the following is a potential advantage of advanced planning such as with living wills and durable powers of attorney for healthcare?
  - a. Achieve personal and family financial goals.
  - b. Ensure that patients’ preferences for medical treatment is followed.
  - c. can limit the financial impact of this end-of-life medical care.
  - d. All the above.
5. In Hussein and James, which of the following added statements resulted in the greatest increase in intentions to complete a living will document?
  - a. A living will can relieve family members of difficult decisions (family benefit only).
  - b. Many people like to have a living will (social norms only).
  - c. Many people like to have a living will because it can relieve family members of difficult decisions (family benefit and social norms combined).
  - d. The living will is only used at the end of life if a person cannot be cured (terminally ill) or is permanently unconscious (end of life only)



## Call for Papers & Proposals Virtual Conference

***Due June 1, 2021***

**The Academy of Financial Services 35<sup>th</sup> Annual Meeting  
September 21-22, 2021, Virtual Conference**

The Academy of Financial Services will hold its annual conference in conjunction with the FPA BE annual conference. This year, we will have a **VIRTUAL CONFERENCE**.

**\$199 for academics and practitioners and \$99 for students.**

- The AFS Conference will feature speakers, symposia, and several special sessions. Among them, we will introduce a ***new panel session for PhD students, highlighting how to best navigate the job market.***
- With the generous support of our sponsors, the Academy has **awarded several best paper awards** during past meetings and we anticipate continuing Best Paper awards in 2021.
- We will continue with our **Emerging Scholar Award** to a current graduate student for promising research work on a paper or poster presented at the conference.
- **In addition, in 2021, we will continue with the Program Directors track.** The goal is to allow program directors to present and discuss program issues and best practices in a panel environment, such as “*Working with Your University’s Foundation*”, “*Capstone Course Cases: What’s the Right Content?*”, “*Understanding Career Paths and Student Fit*” and “*Developing a Passionate Program in a Box: Scholarships, Competitions, Student organizations*”. We welcome other panel topics deemed beneficial to program directors.

**Submission Information:** Research papers and abstracts covering all aspects of individual financial management and education are sought for inclusion in the program. Papers in the areas of estate planning, insurance, tax accounting aspects of financial planning, investments, and retirement planning are encouraged. Proposals for panel discussions and tutorials devoted to current issues in individual financial management or the practice of financial planning will also be considered for inclusion in the program. Several sessions will be registered for Continuing Education (CE) credit with the CFP® Board.

Please be advised that you must be an AFS member in good standing when you register for the conference. Membership has always been required to register for and attend the AFS Conference.

**For further Information:**

- Go to the AFS website at [academyfinancial.org](http://academyfinancial.org) that will be frequently updated.
- *For content questions contact Program Chair, **Terrance K. Martin Jr** at [terrance.martin@uvu.edu](mailto:terrance.martin@uvu.edu)*

**Important Information**

- **Submit proposals here:** <http://proposalspace.com/calls/d/1306>
- Submissions are **due June 1<sup>st</sup>**
- The review period ends on July 15th, 2021 with the selection period and formulation of the agenda estimated to be completed by August 15th, 2021. Notice of acceptance as an oral session is targeted for August 31st, 2021.
- Note that the Terms and Conditions of this Call-For are outlined in the online submission form.
- Only accepted presentations are included in the subsequent proceedings, which are posted on the AFS website. Thus, the proceedings publication is refereed in order to accommodate the rules of the American Association of Intercollegiate Schools of Business-International (AACSB) on Table 2-1 (Intellectual Contributions).

## MANUSCRIPT SUBMISSIONS and STYLE

(1) Papers must be in English.

(2) Papers for publication should be sent to the Editor: Professor Stuart Michelson, E-mail: smichels@stetson.edu.

Electronic (Email) submission of manuscripts is encouraged, and procedures are discussed below.

There is a \$100 submission fee payable to the Academy of Financial Services (AFS) if at least one of the authors is a member of AFS. Submission fees should be paid online at [academyfinancial.org](http://academyfinancial.org). If none of the authors is a member of AFS, please complete an online membership application form, which can be downloaded at <http://academyfinancial.org>, and pay online (\$225 total; \$125 for a one-year membership and \$100 submission fee). Submission of a paper will be held to imply that it contains original unpublished work and is not being considered for publication elsewhere. The Editor does not accept responsibility for damage or loss of papers submitted. Upon acceptance of an article, author(s) transfer copyright of the article to the Academy of Financial Services. This transfer will ensure the widest possible dissemination.

(3) Submission of papers: Authors should submit their papers electronically as an e-mail attachment to the Editor at smichels@stetson.edu. Please send the paper in Word format. Do not send PDFs. Ensure that the letter 'l' and digit '1', and also the letter 'O' and digit '0' are used properly, and format your article (tabs, indents, etc.) consistently. Do not allow your word processor to introduce word breaks and do not use a justified layout. Please adhere strictly to the general instructions below on style, arrangement and, in particular, the reference style of the journal.

(4) Manuscripts should be double spaced, with one-inch margins, and printed on one side of the paper only. All pages should be numbered consecutively, starting with the title page. Titles and subtitles should be short. References, tables, and legends for the figures should be printed on separate pages.

(5) The first page of the manuscript, the Title Page, must contain the following information: (i) the title; (ii) the name(s), title, institutional affiliation(s), address, telephone number, fax number and e-mail addresses of all the author(s) with a clear indication of which is the corresponding author; (iii) at least one classification code according to the Classification System for Journal Articles as used by the Journal of Economic Literature, which can be found at <http://www.aeaweb.org/journal/elclasjn.html>; in addition, up to five key words should be supplied.

(6) Information on grants received can be given in a footnote on the Title page.

(7) The abstract, consisting of no more than 100 words, should appear alone on page 2, titled, Abstract.

(8) Footnotes should be kept to a minimum and should only contain material that is not essential to the understanding of the article. As a rule of thumb, have one or less footnote, on average, per two pages of text.

(9) Displayed formulae should be numbered consecutively throughout the manuscript as (1), (2), etc. against the right-hand margin of the page. In cases where the derivation of formulae has been abbreviated, it is of great help to the referees if the full derivation can be presented on a separate sheet (not to be published).

(10) The Financial Services Review journal (FSR) follows the APA Publication Manual, 6th Edition, style. However, consistent with the current trend followed by other publications in the area of finance, the journal has a very strong preference for articles that are written in the present tense throughout.

References to publications should be as follows: "Smith (1992) reports that" or "This problem has been studied previously (Ho, Milevsky, & Robinson, 1999)." The author should make sure that there is a strict one-to-one correspondence between the names and years in the text and those on the reference list.

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### *Books:*

Hawawini, G. & Swary, I. (1990). Mergers and acquisitions in the U.S. banking industry: Evidence from the capital markets. Amsterdam: North Holland.

### *Chapter in a book:*

Brunner, K. & Meltzer, A. H. (1990). Money supply. In: B. M. Friedman & F. H. Hahn (Eds.), *Handbook of monetary economics* (Vol. 1, pp. 357-396). Amsterdam: North Holland.

### *Periodicals:*

Ang, J. S. & Fatemi, A. M. (1997). Personal bankruptcy costs: their relevance and some estimates. *Financial Services Review*, 6, 77-96.

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