Financial Literacy and the Use of Interest-Only Mortgages

Martin C. Seay,[a] Gloria L. Preece,[b] and Vincent C. Le[c]

This study explored the relationship between financial literacy and the use of interest-only mortgages using data from the 2009 National Financial Capability Study (NFCS). A series of analyses were conducted to investigate characteristics associated with the use of an interest-only mortgage as a primary mortgage, as compared to fixed-rate mortgage and adjustable-rate mortgage (ARM) options. Consistent results indicate the individuals who incorrectly answered questions related to compound interest, mortgages, and diversification were more likely to be using an interest-only mortgage. Respondents with higher reported math skills were less likely to use an interest-only mortgage, whereas individuals with higher levels of financial confidence were more likely to be using one. These results reinforce concerns about a household's ability to understand and evaluate complex mortgage products.

Keywords: bounded rationality, financial literacy, mortgage choice, mortgage crisis

The 2008 financial crisis brought increased awareness and concern for the need to improve consumers' understanding of personal finance concepts (President's Advisory Council on Financial Literacy, 2008). One specific area of interest was the growth of alternative mortgage option, with concerns noted about a consumer's ability to fully understand and budget for the financial impact of those mortgages over time (Bianco, 2008). One of the mortgage types that became mainstream during this time period was interest-only mortgages. As compared to fixed-rate mortgage and adjustable-rate mortgage (ARM), interest-only borrowers make no principal payments. Typically, this leads to lower monthly payments, which can be attractive to income-constrained households. At the end of the loan term, typically 5 or 7 years later, borrowers are required to pay off the entire loan balance. The demand for interest-only mortgages exploded leading up to the financial crisis, with the percentage of all new mortgages classified as interest-only growing from 6% to 31% nationwide between 2002 and 2005 (Fishbein & Woodall, 2006). This growth was notable, the use of an interest-only mortgage as a primary mortgage is structurally different than more traditional loan options. Although consumers receive the benefit of lower monthly payments, the lack of principal payments results in the need for full payoff at loan termination. If unplanned for, consumers have few choices at the end of the loan term: amortize the remaining principal amount into a new mortgage or pay off the loan balance. Although many borrowers sought to refinance their mortgages, they encountered significant problems if the value of the home had decreased. This occurred with regularity during the financial crisis, with the drop in housing prices leaving many households owing balloon payments significantly larger than their homes' values. Consequently, many interest-only mortgage holders defaulted on their mortgages or simply walked away from their debt altogether (Bianco, 2008). Although other mortgage type borrowers saw the same decrease in home values, they were more able to meet existing loan terms without concerns of foreclosure.

The use of an interest-only mortgage may make sense for some households, as it requires lower monthly payments and can increase purchasing power. During the time period under investigation, a popular strategy included using an interest-only mortgage to purchase a house when a buyer planned to occupy the property for a short term (Fishbein & Woodall, 2006). In an appreciating real estate market, the use of an interest-only mortgage can minimize borrowing

[a]*Associate Professor, School of Family Studies and Human Services, Kansas State University, Manhattan, KS. E-mail: mseay@k-state.edu*
[b]*PhD Candidate, School of Family Studies and Human Services, Kansas State University. Lecturer of Business, School of Business, Indiana University Kokomo, Kokomo, IN. E-mail:gpreece@iuk.edu*
[c]*PhD Student, School of Family Studies and Human Services, Kansas State University, Manhattan, KS. E-mail: Vincent.le@doane.edu*

Journal of Financial Counseling and Planning, Volume 28, Number 2, 2017, 168–180

http://dx.doi.org/10.1891/1052-3073.28.2.168

costs while allowing investors to maximize returns from real estate appreciation. Barlevy and Fisher (2010) found that interest-only mortgage usage was more prevalent in cities that experienced high housing price appreciation, suggesting that this strategy may have been widely employed. However, Barlevy and Fisher also note that many of these cities were the ones that saw the largest drop in home values during the housing bust.

Although these strategies existed and were employed, several studies found that many consumers failed to consider all of the implications of interest-only mortgages. Although loan terms are made available to borrowers at loan origination, consumers generally struggle to understand them and fail to conceptualize their impact (Lusardi, 2011). For example, Bucks and Pence (2008) found borrowers with ARM underestimated or simply did not know the extent to which their interest rates could fluctuate. Fishbein and Woodall (2006) indicated that consumers were drawn to interest-only mortgages for the affordability of the initial payments, while not taking into account the balloon payment. Similarly, Fratantoni, Duncan, Brinkmann, Velz, and Woodwell (2005) noted the focus on immediate payments by borrowers with little consideration given to the potential payment shock down the road. An individual's ability to understand mortgages is hindered by the infrequency of mortgage transactions, as borrowers are unlikely to retain knowledge from previous experiences (Collins, 2009). Given this background, the purpose of this study is to investigate the relationship between financial literacy and the use of interest-only mortgages as a primary mortgage during the time period directly leading up to the financial crisis. Understanding this relationship will provide insight into the type of individual drawn to interest-only mortgages as well as their capacity to understand the financial implications of this nonstandard mortgage product. This is of critical importance given the high default rate of interest-only mortgage borrowers during this time period.

Literature Review

Financial Literacy and Borrowing Decisions

A wide body of literature has investigated the link between financial literacy and financial behavior. For example, financial knowledge has been found to be positively associated with financial best practices (Robb & Woodyard, 2011), retirement planning behavior (Lusardi & Mitchell, 2006, 2009), seeking financial advice (Collins, 2012; Robb, Babiarz, & Woodyard, 2012), and stock ownership (Calvet, Campbell, & Sodini, 2009). Within this body of work, a number of studies have focused specifically on financial literacy as it relates to borrowing decisions. Financially illiterate individuals are more likely to exhibit poor credit card behaviors (Allgood & Walstad, 2013; Xiao, Tang, Serido, & Shim, 2011) and use high-cost debt instruments (Lusardi & Scheresberg, 2013). Huston (2012) found that financially literate consumers were more likely to pay below average interest rates on debt and to make cost-effective borrowing decisions. Stango and Zinman (2009) found that consumers with lower levels of financial literacy make systematic mistakes in evaluating debt such as underestimating interest rates. Furthermore, individuals with low levels of financial literacy are more likely to use high-cost debt instruments, even when their objective situation does not warrant their use (Robb, Babiarz, Woodyard, & Seay, 2015).

Financial Literacy and Mortgage Behavior

Although only a limited number of studies have investigated interest-only mortgage borrowing behavior specifically, the literature does provide significant insight into the link between financial literacy and mortgage borrowing behavior. Similar to the work described earlier by Huston (2012), Moore (2003) indicated that financially illiterate individuals are more likely to hold costly mortgages. As related to financial confidence, Moulton, Loibl, Samak, and Collins (2013) indicated that overconfident individuals are more likely to engage in suboptimal mortgage borrowing decisions.

Smith, Finke, and Huston (2011, 2012) paint a more complex picture of the link between financial literacy and mortgage borrowing behavior. Both of these studies used the Survey of Consumer Finances to generate a measure of financial sophistication, a factor loaded scale created from four questions related to observed financial behavior and reported understanding of financial concepts. Smith et al. (2012) found that, overall, financially sophisticated households were less likely to hold higher levels of mortgage debt. However, once marginal tax rates and the ability to itemize deductions were considered, financially sophisticated households were more likely to have higher loan-to-value ratios. Similarly, Smith et al. (2011) found financially illiterate households were more likely to choose an ARM, as compared to a fixed-rate mortgage, in the presence of income constraints. However, further analyses indicated that more sophisticated households, controlling for risk

tolerance, were more likely to choose an ARM when an increased interest rate spread existed between ARM and fixed-rate mortgages (Smith et al., 2011). These findings suggest that financially literate households are better able to compare mortgages and take important factors into account when making mortgage decisions.

Other Factors Influencing Mortgage Choice

Research has identified a number of other factors that are influential in mortgage choice decisions. Smith et al. (2011) found net worth, the probability of moving, and income expectations to be positively associated with the likelihood of having an ARM. Similar evidence was provided by Bergstresser and Beshears (2010) and Campbell (2006), which indicated that households experiencing credit constraints or who had a greater possibility of moving were more likely to have nonstandard mortgages. Sa-Aadu and Sirmans (1995) found that younger households were more likely to use nonstandard mortgages, indicating that this was a proxy of an increased likelihood of moving. In terms of education, Coulibaly and Li (2009) found that less educated individuals were more likely to choose an ARM as compared to a fixed-rate. Furthermore, Coulibaly and Li found that borrowers who are more risk averse and have more unstable or risky income tend to prefer fixed-rate mortgages. Last, Dhillon, Shilling, and Sirmans (1987) found that married individuals are more likely to use nonstandardized loan products, potentially because of household stability.

Theoretical Framework and Hypotheses

The theory of bounded rationality indicates that an individual's decisions are often made based on restricted information or limited scope and not as a direct result of the pursuit of consistent goals (Simon, 2000). Furthermore, the ability of an individual to gather and evaluate information to make conclusions is limited because of three major issues: (a) environments are complex, (b) mental capacities are limited when compared with demands, and (c) resources, such as time or money, are finite (Ibrahim, 2009). This results in humans making decisions that are intended to be rational in nature but, in reality, are often far from rational.

Significant evidence exists showing that individuals exhibit bounded rationality when making financial decisions (Robb et al., 2015). Within the context of financial decisions, financial literacy is a measure of an individual's ability to evaluate situations and to make optimal choices. In providing a conceptual framework for financial literacy, Huston (2010) indicated that an individual must be both financially knowledgeable and have the ability to apply that knowledge to a given situation to be financially literate. *Financial knowledge* is defined as the factual understanding of financial concepts, whereas *financial ability* is related to an individual's capability and confidence in translating knowledge to action.

A high level of complexity exists in making mortgage decisions, suggesting that a high level of financial literacy is often required to take full advantage of potential positive outcomes (Bianco, 2008; Smith et al., 2011, 2012). The borrowing decision lies in forecasting future utility based on incomplete amounts of present data and information. A consumer must weigh future costs against potential future increases in pay, interest rates, and even congressional actions (i.e., Home Affordable Refinance Program). Although pricing plays the dominant role in the mortgage decision, there are other factors a consumer must consider, such as upfront cost of the mortgage and/or down payment, monthly cost of the mortgage, credit score, current and/or future income, current and/or future interest rates, the lender, available funds, risk tolerance, and price range (Dhillon et al., 1987). Consequently, the following research hypotheses were formed:

H1: Financial knowledge is negatively associated with the use of interest-only mortgages.

H2: Financial ability is negatively associated with the use of interest-only mortgages.

Methodology

Data and Sample

This study used data from the 2009 National Financial Capability Study (NFCS) State-by-State Survey to investigate mortgage borrowing behavior. The NFCS2009 was supported by the Financial Industry Regulatory Authority Investor Education Foundation to investigate consumer financial capability and its link with financial behavior. Using nonprobability quota sampling methods, respondent interviews were conducted online between May and October 2009. Roughly 500 respondents from each state and the District of Columbia were collected, yielding an overall sample size of 28,146 observations in total.

Sample weights, based on the American Community Survey, are provided to normalize the data to be nationally representative.

Information was collected regarding the respondent's demographic characteristics, financial capability, financial behaviors, financial beliefs, and financial status. Most important for this study, data were collected related to an individual's primary mortgage type. Given this availability, three criteria were applied to select respondents for analysis. First, mortgage holding households were identified. Next, the sample was restricted to households of working age (age 25–64 years). Last, the sample was restricted to individuals who purchased their homes within the previous 10 years. Given the collection period in 2009, this 10-year window coincides with the arrival of unprecedented appreciation in the late 1990s (Shiller, 2008) and the rise of interest-only mortgage use (Fishbein & Woodall, 2006), which led to a sample of 4,138 observations.

Dependent Variables

The NFCS2009 presented a series of questions regarding homeownership and mortgages. If a respondent was identified as a homeowner, they were asked if they had a mortgage and, if so, two questions were used to identify the mortgage type. Respondents were instructed to only provide information regarding their primary mortgage. Based on these questions, respondents were identified as having a fixed-rate mortgage, an ARM, or an interest-only mortgage. For this study, the dependent variable of each analysis is the use of an interest-only mortgage. Notably, the NFCS2012 did not collect information related to interest-only mortgages.

Financial Literacy

Huston (2010) conceptualized financial literacy as having two dimensions: financial knowledge and financial ability. To be financially literate, an individual must pair financial knowledge with the ability to apply that knowledge in specific financial scenarios. Huston (2010) further indicated that financial ability is based on an individual's confidence in their understanding of financial concepts and their capability in evaluating financial scenarios.

Financial Knowledge. Financial knowledge—the first aspect of financial literacy—has been described as understanding key financial terms and concepts needed to function in today's society (Bowen, 2002). To obtain the level of the respondent's financial understanding, objective financial knowledge was measured using three generally accepted financial knowledge questions regarding compound interest, mortgages, and diversification (Lusardi & Mitchell, 2006, 2009). The selected knowledge questions related to understanding the costs, benefits, and risks associated with interest-only mortgages are as follows:

1. Compound interest: "Suppose you had $100 in a savings account and the interest rate was 2% a year. After 5 years, how much do you think you would have in the account if you left the money to grow?"
2. Mortgages: "A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less."
3. Diversification: "Buying a single company's stock usually provides a safer return than a stock mutual fund."

Whereas the compound interest question offered a multiple choice response, the mortgage and diversification questions were true or false questions. To limit guessing, "don't know" and "prefer not to say" response options were included for each question. Binary variables were created to identify whether a household correctly answered each knowledge question.

Financial Ability. Financial ability—the second dimension of financial literacy—is defined as an individual's capability to apply financial knowledge to specific financial scenarios. Although specific measures are not included, three questions were identified as capturing components of financial ability. The first two statements were presented to the respondents with instructions asking them to indicate how strongly they agreed or disagreed with the statements on a 1–7 Likert-type scale ranging from 1 as *strongly disagree* to 7 as *strongly agree*. The two statements were as follows:

1. Day-to-day: "I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses."
2. Math: "I am pretty good at math."

The last question, which measures an individual's confidence in their financial knowledge, was assessed using the following question:

3. Subjective knowledge: "On a scale from 1 to 7, where 1 means *very low* and 7 means *very high*, how would you assess your overall financial knowledge?"

Within Huston's (2010) definition of financial ability, the day-to-day and subjective knowledge questions are measures of a respondent's confidence in making financial decisions, whereas the Math scale is a measure of how capable a respondent is at applying their knowledge to different financial scenarios.

Financial Characteristics

The NFCS2009 contains an array of information related to a respondent's financial characteristics. In addition to employment status, a categorical measure of income is available with the following ranges: (a) less than $35,000; (b) $35,000–$49,999; (c) $50,000–$74,999; (d) $75,000–$99,999; (e) $100,000–$149,999; and (f) more than $150,000. Although net worth information is not available, the NFCS2009 does include several questions that indicate the presence of financial assets. Binary variables were included to identify the presence of the following: (a) stocks, bonds, or mutual funds outside of retirement plans; (b) employer-sponsored retirement plan; (c) self-funded retirement plan; (d) an emergency fund that covers 3 months expenses; and (e) real estate other than primary residence.

A respondent's risk tolerance was measured by the following question: "When thinking of your financial investments, how willing are you to take risks?" Respondents answered on a scale from 1 to 10, with higher scores being associated with increased willingness to take risks. Because of the timing of the survey, these characteristics were measured after the mortgage decision but still provide insight into a household's financial characteristics.

Length of Home Ownership

As indicated earlier, the sample was restricted to households that purchased their homes in the 10 years preceding the survey. To further isolate economic and temporal effects on mortgage decisions, a categorical variable was included indicating when the households had purchased their home. Available response categories include (a) Within the past 2 years, (b) 3–5 years ago, and (c) 6–10 years ago.

Sociodemographic Characteristics

The NCFS2009 also collected a variety of information related to a respondent's sociodemographic characteristics. The following variables were included as control variables: age, gender, marital status, education level, presence of dependent children in the household, race/ethnicity, and census region.

Data Analysis

The association between financial literacy and mortgage choice was investigated in two ways. First, a logistic regression analysis was generated to estimate the probability of having an interest-only mortgage as compared to all other mortgage types. The sample for this analysis included all 4,138 respondents who had a fixed-rate mortgage, ARM, or interest-only mortgage. Next, a multinomial logistic regression analysis was conducted. This was conducted in a manner so as to estimate the probability of having an interest-only mortgage as compared to each of the other loan types in isolation. These subsample analyses will provide further information on how financial literacy is associated with mortgage choice. All analyses used normalized weighting information in the NCFS2009 to generate population representative estimates.

Results

Descriptive Statistics

Weighted sample descriptives can be found in Table 1. The full sample contains 4,138 nonretired mortgage holders between the ages of 25 and 65 years who purchased their home in the 10 years leading up to 2009. The vast majority of respondents (75%) held a fixed-rate mortgage, with 18% holding an interest-only mortgage, and 7% holding an ARM. In terms of timing of purchase, 64% of the sample purchased their homes within 5 years of 2009, the critical time leading up to the financial crisis of 2008. A large majority (76%) of the sample was married, 64% were employed full time, and 78% of the sample reported incomes of more than $50,000. The sample was highly educated, with 83% having an education level of "some college or more." In terms of financial assets, 51% owned stocks, bonds, or mutual funds; 80% had an employer-sponsored retirement plan; 42% had an individual retirement plan; 45% had an emergency fund; and 21% owned real estate other than their primary home.

TABLE 1. Descriptive Statistics of the Weighted Sample Descriptive (*N* = 4,138)

Variable	Percent	Variable	Percent
Mortgage type		Dependent children	
Interest-only	0.18	None	0.39
Fixed-rate	0.75	One	0.21
Adjustable-rate	0.07	Two	0.25
Financial knowledge		Three or more	0.15
Compound interest	0.90	Education	
Mortgages	0.93	Less than college	0.17
Diversification	0.74	Some college	0.38
Financial ability		College education	0.27
Math	5.95	Graduate education	0.18
Day-to-day	5.89	Marital status	
Subjective knowledge	5.28	Married	0.77
Financial characteristics		Unmarried	0.23
Stocks, bonds, mutual funds	0.51	Income	
Employer-sponsored retirement account	0.80	Less than $35,000	0.10
Individual retirement account	0.42	$35,000–$50,000	0.12
Emergency fund	0.45	$50,000–$75,000	0.24
Owns additional real estate	0.21	$75,000–$100,000	0.21
Risk tolerance	5.26	$100,000–$150,000	0.20
Time since home purchase		More than $150,000	0.13
Within 2 years	0.22	Employment status	
3–5 years	0.43	Full-time	0.64
6–10 years	0.36	Part-time	0.06
Gender		Self-employed	0.11
Male	0.56	Not employed	0.19
Female	0.44	Region	
Age		South	0.34
25–34 years	0.28	Midwest	0.22
35–44 years	0.35	Northeast	0.16
45–54 years	0.24	West	0.27
55–64 years	0.13		
Race			
White	0.73		
Non-White	0.27		

In terms of financial knowledge, 90% were able to answer the compound interest question correctly, 93% were able to answer the mortgage question correctly, and 74% were able to answer the diversification question correctly. On average, respondents were confident in their math ability, ability to deal with day-to-day financial matters, and in their financial knowledge. On scales from 1 to 7, mean scores for each question were 5.95, 5.89, and 5.28, respectively.

Logistic Regression Results

Results of the logistic regression model predicting use of an interest-only mortgage in the full sample can be found in

TABLE 2. Logistic Regression Results

Variable	*B*	*SE B*	*OR*	Variable	*B*	*SE B*	*OR*
Intercept	−0.39	0.38	—	Dependent children			
Financial knowledge				None	—	—	—
Compound interest	−0.49***	0.14	0.61	One	0.11	0.13	1.09
Mortgages	−0.86***	0.16	0.42	Two	0.07	0.13	1.07
Diversification	−0.30**	0.11	0.74	Three or more	0.08	0.15	1.05
Financial ability				Education			
Math	−0.08*	0.04	0.92	Less than college	—	—	—
Day-to-day	0.05	0.04	1.05	Some college	−0.16	0.13	0.86
Subjective knowledge	0.12**	0.05	1.13	College education	0.24	0.15	0.79
Financial characteristics				Graduate education	−0.33†	0.17	0.72
Stocks, bonds, mutual funds	0.33**	0.12	1.40	Marital status			
Employer retirement account	0.11	0.13	1.12	Married	−0.05	0.12	0.95
Individual retirement account	−0.24*	0.11	0.78	Unmarried	—	—	—
Emergency fund	0.03	0.10	1.08	Income			
Owns additional real estate	0.12	0.12	1.12	Less than $35,000	—	—	—
Risk tolerance	0.06**	0.02	1.06	$35,000–$50,000	−0.08	0.18	0.93
Time since home purchase				$50,000−$75,000	−0.37*	0.17	0.69
Within 2 years	—	—	—	$75,000–$100,000	−0.64**	0.19	0.53
3–5 years	0.12	0.12	1.14	$100,000– $150,000	−0.50*	0.20	0.61
6–10 years	0.13	0.13	1.15	More than $150,000	−0.55*	0.22	0.58
Gender				Employment status			
Male	0.27*	0.11	1.31	Full-time	—	—	—
Female	—	—	—	Part-time	0.46*	0.19	1.58
Age				Self-employed	0.29†	0.15	1.33
25–34 years	—	—	—	Not employed	0.32*	0.13	1.37
35–44 years	−0.22†	0.12	0.81	Region			
45–54 years	0.15	0.13	1.18	South	—	—	—
55–64 years	−0.05	0.17	0.96	Midwest	−0.12	0.13	0.89
Race				Northeast	−0.17	0.14	0.84
White	−0.69***	0.11	0.50	West	−0.03	0.12	0.98
Non-White	—	—	—	Pseudo R^2			0.06
				Concordance ratio			0.65

Note. *OR* = odds ratio.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Consistent results suggest that financial knowledge is negatively associated with interest-only mortgage use. Specifically, the odds of having an interest-only mortgage were 58% ($p < .001$) lower for individuals who correctly answered the mortgage question, 39% ($p < .001$) lower for individuals who correctly answered the compound interest question, and 26% ($p < .01$) lower for individuals who correctly answered the diversification question. Somewhat conflicting results were found in the relationship between financial ability and interest-only mortgage use. A one-unit

increase in the math scale decreased the odds an individual had an interest-only mortgage by 9% ($p < .05$). However, a one-unit increase in subjective financial knowledge increased the odds of using an interest-only mortgage by 13% ($p < .01$). This result for subjective financial knowledge is similar to previous research into borrowing behavior (Allgood & Walstad, 2013; Moulton et al., 2013; Robb et al., 2015), which may suggest the presence of an overconfidence effect.

Interesting results were found related to education, employment status, and income. As compared to those with a high school diploma, those with some college and those with a graduate education were significantly less likely to have an interest-only mortgage. No difference was found for those with a college degree. As related to income, all income groups with income more than $50,000 were significantly ($p < .05$) less likely to have an interest-only mortgage. This may suggest borrowers were drawn to interest-only mortgages because of their lower recurring monthly payments. Similarly, those that were part-time employed or not employed were significantly ($p < .05$) more likely to select an interest-only mortgage as compared to those that were full-time employed.

Other results suggest that males; non-Whites; those who owned stocks, bonds, or mutual funds outside of retirement accounts; and those with higher risk tolerances were more likely to be using an interest-only mortgage. No relationship was found between timing of purchase and mortgage type.

Multinomial Logistic Results

The purpose of the second stage of analyses was to better isolate the link between financial literacy and mortgage choice. Results of the multinomial logistic regression analysis can be found in Table 3.

Interest-Only Versus Fixed-Rate. The first model specifically investigated the differences between individuals that selected a fixed-rate mortgage and those that selected an interest-only mortgage. Results for this analysis were almost identical to those found in the full sample analysis as related to financial knowledge and confidence. Specifically, the odds of having an interest-only mortgage were 61% ($p < .001$) lower for individuals who correctly answered the mortgage question, 36% ($p < .001$) lower for individuals who correctly answered the compound interest question, and 27% ($p < .01$) lower for individuals who correctly answered the diversification question. Similarly conflicting results were found in the relationship between financial ability and interest-only mortgage use. Although marginally significant results ($p < .10$) indicate a one-unit increase in the math scale decreased the odds an individual had an interest-only mortgage by 7%, a one-unit increase in subjective financial knowledge increased the odds of using an interest-only mortgage increase by 15% ($p < .01$). Results for all other variables in the model were similarly consistent.

Interest-Only Versus Adjustable-Rate. The second model within the multinomial logistic estimated the likelihood that an individual would have an interest-only mortgage as compared to an ARM. The subsample for this analysis was much smaller ($n = 938$) given the relatively few respondents that indicated using an ARM. A consistent, albeit weaker, story is told regarding the relationship between financial literacy and interest-only mortgage use. As related to financial knowledge, correctly answering the compound interest question lowered the odds an individual used an interest-only mortgage by 60% ($p < .01$). However, no relationship was found for the mortgage and diversification questions and mortgage choice. Only marginally significant ($p < .10$) results were found related to financial ability. Similar to previous models, a one unit increase in the math scale decreased the odds an individual had an interest-only mortgage by 10%. No relationship was detected between subjective financial knowledge and mortgage choice, but taking its place was a significant relationship between the day-to-day scale and mortgage choice. Specifically, a unit increase in the day-to-day scale increased the odds of using an interest-only mortgage by 12%.

Other relationships detected were related to timing of home purchase, presence of dependent children, and income. Individuals who had purchased their homes 3 years prior to the survey were significantly less likely to use an interest-only mortgage as compared to an ARM. Once again, income was found to be negatively associated with use of interest-only mortgages. Last, individuals with two children in the home were more likely to use an interest-only mortgage as compared to those with no children.

Discussion

This study explored the relationship between financial literacy and the use of interest-only mortgages. It was conducted

TABLE 3. Multinomial Logistic Results Predicting Interest-Only Mortgage Use

	Interest-Only Versus Fixed-Rate (N = 3,855)			Interest-Only Versus Adjustable-Rate (N = 936)		
Variable	***B***	***SE B***	***OR***	***B***	***SE B***	***OR***
Intercept	−0.24	0.39		2.53**	0.69	
Financial knowledge						
Compound interest	−0.44**	0.14	0.64	−0.92**	0.30	0.40
Mortgages	−0.95***	0.17	0.39	−0.28	0.28	0.76
Diversification	−0.32**	0.11	0.73	−0.18	0.19	0.83
Financial ability						
Math	−0.08†	0.04	0.93	−0.11	0.07	0.90
Day-to-day	0.04	0.04	1.05	0.11†	0.07	1.12
Subjective knowledge	0.14**	0.05	1.15	0.01	0.08	1.01
Financial characteristics						
Stocks, bonds, mutual funds	0.34**	0.11	1.41	0.25	0.19	1.28
Employer retirement account	0.04	0.13	1.04	0.65**	0.21	1.91
Individual retirement account	−0.26*	0.11	0.77	−0.13	0.19	0.88
Emergency fund	−0.00	0.11	1.00	0.34†	0.18	1.41
Owns additional real estate	0.12	0.12	1.13	0.10	0.20	1.10
Risk tolerance	0.06**	0.02	1.07	0.04	0.04	1.04
Time since home purchase						
Within 2 years	—	—	—	—	—	—
3–5 years	0.23†	0.13	1.26	−1.26***	0.27	0.28
6–10 years	0.21†	0.13	1.24	−1.09***	0.29	0.34
Gender						
Male	0.29**	0.11	1.34	0.06	0.18	1.07
Female	—	—	—	—	—	—
Age						
25–34 years	—	—	—	—	—	—
35–44 years	−0.27*	0.12	0.76	0.22	0.20	1.24
45–54 years	0.12	0.13	1.13	0.34	0.21	1.4
55–64 years	−0.12	0.17	0.89	0.48†	0.29	1.62
Race						
White	−0.74***	0.10	0.48	−0.30†	0.17	0.74
Non-White	—	—	—	—	—	—
Dependent children						
None	—	—	—	—	—	—
One	0.06	0.13	1.07	0.52*	0.22	1.68
Two	0.03	0.13	1.03	0.50*	0.22	1.66
Three or more	0.04	0.15	1.04	0.42†	0.26	1.53

(Continued)

TABLE 3. Multinomial Logistic Results Predicting Interest-Only Mortgage Use *(Continued)*

	Interest-Only Versus Fixed-Rate (N = 3,855)			Interest-Only Versus Adjustable-Rate (N = 936)		
Variable	***B***	***SE B***	***OR***	***B***	***SE B***	***OR***
Education						
Less than college	—	—	—	—	—	—
Some college	−0.18	0.13	0.83	0.08	0.22	1.08
College education	−0.27†	0.15	0.76	0.01	0.25	1.01
Graduate education	−0.35*	0.18	0.70	−0.17	0.28	0.84
Marital status						
Married	−0.06	0.12	0.94	−0.06	0.2	0.95
Unmarried	—	—	—	—	—	—
Income						
Less than $35,000	—	—	—	—	—	—
$35,000–$50,000	−0.01	0.19	0.99	−0.60†	0.33	0.55
$50,000–$75,000	−0.33†	0.18	0.72	−0.66*	0.32	0.52
$75,000–$100,000	−0.61**	0.20	0.54	−0.85*	0.35	0.43
$100,000–$150,000	−0.44*	0.20	0.65	−0.98**	0.36	0.37
More than $150,000	−0.48*	0.22	0.62	−1.08**	0.39	0.33
Employment status						
Full-time	—	—	—	—	—	—
Part-time	0.51**	0.20	1.67	0.07	0.32	1.07
Self-employed	0.31*	0.16	1.37	0.09	0.25	1.09
Not employed	0.32*	0.13	1.38	0.32	0.23	1.38
Region						
South	—	—	—	—	—	—
Midwest	−0.10	0.13	0.91	−0.30	0.20	0.74
Northeast	–0.16	0.15	0.85	−0.27	0.23	0.89
West	−0.05	0.12	0.96	0.15	0.21	1.16

Note. *OR* = odds ratio.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

through the lens of the theory of bounded rationality, which indicates an individual's ability to make optimal financial decisions may be limited by their ability to gather, comprehend, and evaluate information (Ibrahim, 2009). Analysis of data from the NFCS2009 found support for research Hypothesis 1, suggesting that financial knowledge is negatively associated with the use of interest-only mortgages. Specifically, results from Models 1 (interest-only vs. all other types) and 2 (interest-only vs. fixed-rate) found that respondents who correctly answered questions related to compound interest, mortgages, and diversification were significantly less likely to be using an interest-only mortgage. The effect sizes were largest for the mortgage question; the odds that an individual who correctly answered the mortgage question used an interest-only mortgage were between 58% and 61% lower than those of an individual who answered incorrectly. Results were less conclusive in Model 3 (interest-only vs. adjustable-rate), although correctly answering the question related to compound interest lowered the odds an individual was using an interest-only mortgage by 63%.

Mixed results were found related to Hypothesis 2, which suggested that financial ability would be negatively related to the use of interest-only mortgages. As hypothesized, results indicated a negative relationship between a respondent's self-reported math ability and the use of interest-only mortgages. This suggests that those with higher math ability, a measure of the capability dimension of financial ability, were less likely to use an interest-only mortgage. However, subjective financial knowledge (Models 1 and 2) and reported confidence in one's ability to complete day-to-day financial tasks were positively associated with interest-only mortgage use. These results are contrary to what would be hypothesized based on Huston's (2010) financial literacy framework but are consistent with previous research into mortgage (Moulton et al., 2013), credit card (Allgood & Walstad, 2013), and high-cost debt borrowing behavior (Robb et al., 2015). Although Huston (2010) focused on the need for an appropriate level of confidence to empower people to make financial decisions, it is possible that too much confidence can lead to a blinding overconfidence effect. The effect of overconfidence may be exacerbated in the mortgage decision, as overconfident individuals are less likely to seek mortgage advice (Porto & Xiao, 2016).

It should be stated that interest-only mortgages may be the optimal choice for households who expect to live in a house for a short time, have short-term income pressures that are expected to ease, have significant financial assets to protect from any shortcomings related to a balloon payment, or have high risk tolerances. The interest-only mortgage market is similar to the one outlined by Robb et al. (2015) in the high-cost debt instrument market, as there are situations where high-cost debt instruments are the optimal financial decision. Given this, further research is needed to better isolate optimal use of interest-only mortgages and suboptimal use that may harm a consumer's long-term well-being.

Several limitations must be considered. Most notably, measures of financial knowledge and financial ability were collected after mortgage decisions were made. It is possible that knowledge and ability levels changed over time and are not reflective of understanding at the time of purchase. Although concurrent measures would be ideal, it is uncertain that declines in financial knowledge would be isolated to interest-only mortgage holders. Second, while controlling for a consumer's financial situation, this research was unable to fully isolate suboptimal borrowing decisions. Future studies on interest-only mortgages that are better able to differentiate the two, with a focus on understanding the factors associated with suboptimal decision making, are needed.

Practical Implications

This study is of specific importance to policymakers, financial educators, financial counselors, and financial planners. From a policy perspective, this research provides a clear indication that interest-only borrowers have a systematically lower understanding of basic financial concepts. These borrowers appear to be suffering from bounded rationality, attracted to the short-term benefits of lower mortgage payments without fully understanding the long-term risks. Given the high number of mortgage defaults that took place in the interest-only market, this is a clear area for consumer advocacy and protection. For practitioners who work regularly with clients making mortgage borrowing decisions, this study offers valuable insight related to an individual's ability to fully understand the complexities of mortgage products. Extra care should be taken to clearly describe both the short- and long-term financial implications associated with the use of an interest-only mortgage. Furthermore, whether at the practitioner level or at the policy level, an adopted practice which provides consumers a side-by-side comparison of mortgages that highlights both short- and long-term costs, benefits, and risks is recommended. Without an understanding of compound interest, the differences in mortgage products, and concepts related to diversification and risk management, it is unlikely that a borrower will be able to adequately assess interest-only products and properly weigh the benefits of lower short-term payments against the long-term risks because of lack of principal repayment. Given previous literature linking this lack of financial literacy with other negative financial behaviors (Allgood & Walstad, 2013; Robb et al., 2015), these borrowers are also more likely to participate in financial behaviors that will negatively affect their ability to successfully transition out of the interest-only mortgage when it becomes due.

Overall, this research reinforces concerns noted in previous literature about consumer ability to understand the complex and long-term implications of interest-only mortgages (Fishbein & Woodall, 2006). This is of specific concern as interest-only mortgages carry an increased level of financial risk as compared to traditional mortgage options because of their short-term nature and balloon payment. This provides

clear evidence of the need to increase financial education related to interest-only mortgages. Determining whether a consumer has a firm understanding of the mortgage terms and what those terms may mean under varying future interest rate conditions could potentially protect consumers as well as the economic health of the housing market.

References

Allgood, S., & Walstad, W. (2013). Financial literacy and credit card behaviors: A cross-sectional analysis by age. *Numeracy*, *6*(2), 1–26.

Barlevy, G., & Fisher, J. D. M. (2010). *Mortgage choices and housing speculation* (Working Paper 2010-12). Chicago, IL: Federal Reserve Bank of Chicago.

Bergstresser, D., & Beshears, J. (2010). *Who selected adjustable-rate mortgages? Evidence from the 1989-2007 surveys of consumer finances* (Harvard Business School Finance Working Paper No. 10-083). Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1573625

Bianco, K. M. (2008). *The subprime lending crisis: Causes and effects of the mortgage meltdown*. Chicago, IL: Wolters Kluwer Law & Business.

Bowen, C. F. (2002). Financial knowledge of teens and their parents. *Financial Counseling and Planning*, *13*(2), 93–102.

Bucks, B., & Pence, K. (2008). Do borrower's know their mortgage terms? *Journal of Urban Economics*, *64*, 218–233.

Calvet, L. E., Campbell, J. Y., & Sodini, P. (2009). Measuring the financial sophistication of households. *The American Economic Review*, *99*(2), 393–398.

Campbell, J. (2006). Household finance. *The Journal of Finance*. *61*(4), 1553–1604.

Collins, J. M. (2009). *Education levels and mortgage application outcomes: Evidence of financial literacy* (Discussion Paper No. 1369-09). Madison, WI: University of Wisconsin-Madison, Institute for Research on Poverty. Retrieved from http://www.irp.wisc.edu/publications/dps/pdfs/dp136909.pdf

Collins, J. M. (2012). Financial advice: A substitute for financial literacy? *Financial Services Review*, *21*(4), 307–322.

Coulibaly, B., & Li, G. (2009). Choice of mortgage contracts: Evidence from the survey of consumer finances. *Real Estate Economics*, *37*(4), 659–673. http://dx.doi.org/10.1111/j.1540-6229.2009.00259.x

Dhillon, U. S., Shilling, J. D., & Sirmans, C. F. (1987). Choosing between fixed and adjustable rate mortgages: A note. *Journal of Money, Credit and Banking*, *19*(2), 260–267.

Fishbein, A. J., & Woodall, P. (2006). *Exotic or toxic? An examination of the non-traditional mortgage market for consumers and lenders*. Washington, DC: Consumer Federation of America.

Fratantoni, M. (2005). *Housing and mortgage markets: An analysis*. Mortgage Bankers Association. Washington, DC: MBA Research Monograph Series No. 1.

Huston, S. J. (2010). Measuring financial literacy. *The Journal of Consumer Affairs*, *44*(2), 296–316.

Huston, S. J. (2012). Financial literacy and the cost of borrowing. *International Journal of Consumer Studies*, *36*(5), 566–572.

Ibrahim, M. (2009). Theory of bounded rationality. *Public Management*, *91*(5), 3–5.

Lusardi, A. (2011). *Americans' financial capability* (NBER Working Paper No. 17103). Retrieved from http://www.nber.org/papers/w17103.pdf

Lusardi, A., & Mitchell, O. S. (2006). *Financial literacy and planning: Implications for retirement wellbeing* (MRRC Working Paper 2006–144). Retrieved from http://www.dartmouth.edu/~alusardi/Papers/Financial Literacy.pdf

Lusardi, A., & Mitchell, O. S. (2009). *How ordinary consumers make complex economic decisions: Financial literacy and retirement readiness* (NBER Working Paper No. 15350). Retrieved from http://www.nber.org/papers/w15350

Lusardi, A., & Scheresberg, C. B. (2013). *Financial literacy and high-cost borrowing in the United States* (NBER Working Paper No. 18969). Retrieved from http://www.nber.org/papers/w18969

Moore, D. (2003). *Survey of financial literacy in Washington State: Knowledge, behavior, attitudes, and experiences* (Tech. Rep. No. 03–39). Pullman, WA: Washington State University, Social and Economic Sciences Research Center. Retrieved from http://www.sesrc.wsu.edu/sesrcsite/Papers/files/dfi-techreport-FINAL2-16-04.pdf

Moulton, S., Loibl, C., Samak, A., & Collins, J. M. (2013). Borrowing capacity and financial decisions of low-to-moderate income first-time homebuyers. *The Journal of Consumer Affairs*, *47*(3), 375–403.

Porto, N., & Xiao, J. J. (2016). Financial literacy overconfidence and financial advice seeking. *Journal of Financial Service Professionals*, *70*(4), 78–88.

President's Advisory Committee on Financial Literacy. (2008). *Annual report to the president: Executive summary*. Retrieved from https://www.treasury.gov/offices/domestic-finance/financial-institution/fin-education/council/exec_sum.pdf

Robb, C. A., Babiarz, P., & Woodyard, A. (2012). The demand for financial professionals' advice: The role of financial knowledge, satisfaction, and confidence. *Financial Services Review*, *21*(4), 291–305.

Robb, C. A., Babiarz, P., Woodyard, A., & Seay, M. C. (2015). Bounded rationality and use of alternative financial services. *The Journal of Consumer Affairs*, *49*(2), 407–435.

Robb, C. A., & Woodyard, A. S. (2011). Financial knowledge and best practice behavior. *Journal of Financial Counseling and Planning*, *22*(1), 60–70.

Sa-Aadu, J., & Sirmans, C. F. (1995). Differentiated contracts, heterogeneous borrowers, and the mortgage choice decision. *Journal of Money, Credit and Banking*, *27*(2), 498–510.

Shiller, R. (2008). Historic turning points in real estate. *Eastern Economic Journal*, *34*(1), 1–13.

Simon, H. A. (2000). Bounded rationality in social science: Today and tomorrow. *Mind & Society*, *1*(1), 25–39.

Smith, H., Finke, M. S., & Huston, S. J. (2011). The impact of financial sophistication on adjustable rate mortgage ownership. *Journal of Financial Counseling and Planning*, *22*(2), 3–15.

Smith, H., Finke, M. S., & Huston, S. J. (2012). Financial sophistication and housing leverage among older households. *Journal of Family and Economic Issues*, *33*(3), 315–327.

Stango, V., & Zinman, J. (2009). What do consumers really pay on their checking and credit card accounts? Explicit, implicit, and avoidable costs. *American Economic Review*, *99*(2), 424–429.

Xiao, J., Tang. C, Serido, J, & Shim, S. (2011). Antecedents and consequences of risky credit behavior among college students: Application and extension of the theory of planned behavior. *Journal of Public Policy & Marketing*, *30*(2), 239–245.

Acknowledgments. An early version of this article was presented at the 2015 Housing Education and Research Association Conference, with an abstract published in the conference proceedings.