

Financial Knowledge and Best Practice Behavior

Cliff A. Robb and Ann S. Woodyard

The current research examines the relationship between personal financial knowledge (both objective and subjective), financial satisfaction, and selected demographic variables in terms of best practice financial behavior. Data are taken from the Financial Industry Regulatory Authority's (FINRA) National Financial Capability Study, a nationally representative sample of 1,488 participants and are analyzed using multiple regression analysis. Findings suggest that both objective and subjective financial knowledge influence financial behavior, with subjective knowledge having a larger relative impact. Other variables that have a significant impact on financial behavior include financial satisfaction, income, education, age, race, and ethnicity.

Key Words: financial behavior, financial knowledge, financial satisfaction

Introduction

Individuals' financial well-being is incumbent on their actions. Although influenced by external forces such as economic factors and policy structures adopted by government and private industry, decisions are ultimately made by individuals. Understanding the relationship between knowledge of personal financial issues and corresponding financial behavior is increasingly recognized as an area of critical financial importance. Recent economic troubles in the United States and abroad highlight the importance of understanding financial markets.

The American public is increasingly aware of a fact which researchers have known for years: there is a general lack of financial knowledge among United States citizens of all ages (Avard, Manton, English, & Walker, 2005; Chen & Volpe, 1998; Hilgert, Hogarth, & Beverly, 2003; Jump\$tart, 2008; Lusardi & Mitchell, 2007; Mandell & Klein, 2009; Markovich & DeVaney, 1997; Volpe, Chen, & Liu, 2006; Warwick & Mansfield, 2000). This lack of knowledge is increasingly salient as changes to the United States financial system make personal finance an important topic. Understanding issues related to personal finance is important for Americans' long-term financial security as the transition to defined contribution plans and the weakening of the United States Social Security system place greater responsibility on individuals' savings and financial

decisions (Gruber & Wise, 2001; Poterba, Rauh, Venti, & Wise, 2006).

A common response to this lack of financial knowledge is the prescription of education (Scott, 2010), with the general assumption that improved knowledge will result in more effective financial decision-making. Some evidence indicates that the relationship between knowledge and behavior is more complicated as improved knowledge does not automatically result in improved behavior (Braunstein & Welch, 2002). Perry and Morris (2005) suggested that psychological factors, such as locus of control, may mediate the impact of financial knowledge on behavior. The present data suggest that financial knowledge is important, but questions remain as to the exact nature of knowledge's impact on overall financial well-being.

Review of Literature

Knowledge and Behavior

Theoretically, knowledge of how financial markets operate should result in individuals making more effective borrowing decisions (Liebermann & Flint-Goor, 1996). This is generally supported by the available literature as numerous studies indicated that well developed financial skills are necessary for effective money management (Carswell, 2009; Collins, 2007; Haynes-Bordas, Kiss, & Yilmazer, 2009; Scott, 2010). However, the majority of these studies

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failed to provide a direct link between personal financial knowledge and actual financial behavior. Several studies provided evidence of a link between knowledge and behavior, though they vary in how knowledge is measured and what behaviors are addressed.

Numerous studies of financial knowledge emphasized college student populations; some for convenience and others as a population of interest (Borden, Lee, Serido, & Collins, 2008; Chen & Volpe, 1998; Jones, 2005; Robb, 2010; Robb & Sharpe, 2009). Chen and Volpe (1998) established a link between financial knowledge and financial decisions, though it was tenuous at best as the decisions were purely hypothetical. Based on a 36-item measure of knowledge, more knowledgeable students achieved higher scores on hypothetical spending, investment, and insurance decisions when compared with less knowledgeable students. More knowledgeable students were also more likely to keep financial records.

Borden et al. (2008) presented findings that questioned the link between knowledge and behavior, as they did not note any significant relationship between financial knowledge and effective financial behavior. The results presented by Borden et al. (2008) suggested that whereas greater knowledge may improve student intentions towards more responsible behavior, it did not necessarily indicate whether or not students follow through with their plans. Research on credit card use among college students yielded conflicting evidence. An exploratory analysis by Jones (2005) did not provide any evidence of a link between credit card debt behavior and financial knowledge based on a 6-item measure.

Robb and Sharpe (2009) noted a significant relationship between credit card balance behavior and financial knowledge, though not in the direction anticipated. Students with higher scores on a 6-item measure of financial knowledge indicated higher revolving balances, though causality was not assessed because the data were cross-sectional. In contrast, improved credit card management behavior was associated with higher scores on a measure of financial knowledge in a recent study by Robb (2010). Specifically, knowledge had an impact on the probability of individuals revolving a balance, making only the minimum payments, being delinquent, taking cash advances, or maxing out credit cards.

Among the general population, there is some evidence that financial knowledge and financial behavior may be

positively related. Hilgert, Hogarth, and Beverly (2003) examined the correlation between financial knowledge and actual behavior among the general population in the United States. They measured knowledge using the 28-question Financial IQ measure that is included in the Survey of Consumer Finances, which deals with aspects of cash-flow management, credit management, savings, investments, mortgage information, and other financial-management topics (Hilgert et al., 2003). The researchers noted significant correlations between credit management scores and scores on the composite measure of financial knowledge. Lusardi and Mitchell (2006) analyzed retired households, indicating that greater knowledge was associated with planning and succeeding in retirement planning, as well as investing in complex assets such as stocks. Further research by Lusardi and Mitchell (2007) indicated that more knowledgeable Americans thought more about retirement.

To this point, the discussion has emphasized objective financial knowledge. It is important to address the possible impact of subjective financial knowledge (or self-assessed knowledge) as well. Research by Courchane (2005) indicated that self-assessed knowledge was one of the most significant factors in determining financial behavior. However, research has made it clear that people do not always have a full understanding of their own level of financial knowledge (Courchane, 2005).

Financial Satisfaction

Financial satisfaction is an individual's subjective perception of the adequacy of his or her own financial resources (Hira & Mugenda, 1998). Financial satisfaction has long been acknowledged as a component of well-being (Campbell, Converse, & Rodgers, 1976) and has received attention in studies on wellness related stressors such as financial strain, risk management issues, locus of control and employment issues (Porter & Garman, 1993).

While there is no consensus as to how financial satisfaction might best be measured (Joo & Grable, 2004), both single item and multiple item measures have been used to achieve reliable and valid findings. Multiple item measures have consisted of scales (e.g., Hira & Mugenda, 1998; Leach, Hayhoe, & Turner, 1994) or domains (e.g., Draughn, LeBoeuf, Wozniak, Lawrence, & Welch, 1994).

Proposed determinants of financial satisfaction include demographic factors such as income, education, ethnicity, and ages, as well as financial stressors, financial knowledge, and financial attitudes and behaviors. Higher levels of financial knowledge and financial management practices

have been directly related to increased levels of financial satisfaction (Joo & Grable, 2004; Loibl & Hira, 2005). According to Joo and Grable (2004), financial behaviors were found to have more significant and direct effects on financial satisfaction than level of household income or other demographic factors.

Demographics

Aside from the measure of financial knowledge and satisfaction, a number of demographic variables were included in the present analysis. Previous research suggested that the level of available resources has an impact on financial behavior, as consumers with less available resources may fail to meet all of their financial obligations, or lack the means to save (Aizcorbe, Kennickell, & Moore, 2003; Hilgert et al., 2003). Many targeted financial programs are aimed at minority populations, suggesting that there are differences in financial behavior that may be explained primarily by race or ethnicity. Research focusing on college students indicated that minority students were more likely to display risky financial behaviors (Lyons, 2004).

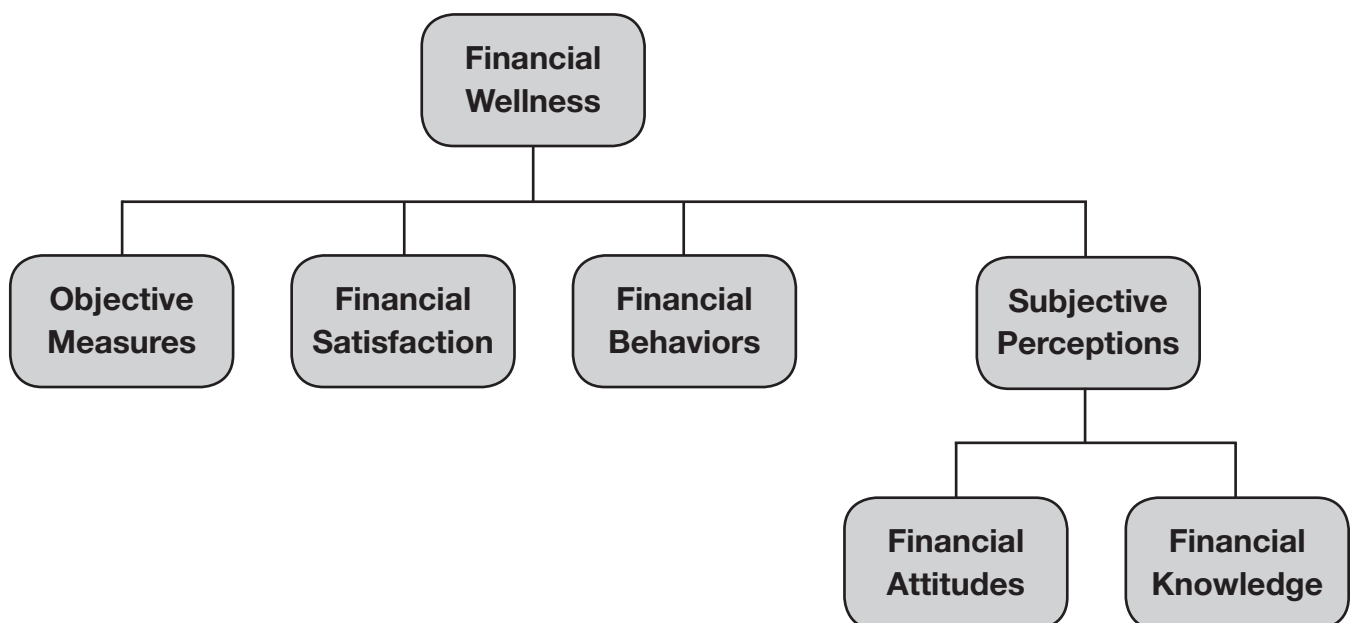
Gender differences in financial behavior have been identified in previous studies. Women were more likely to report the use of sound financial practices (Hayhoe, Leach, Turner, Bruin, & Lawrence, 2000), but they also tended to score lower on measures of financial knowledge (Chen & Volpe, 2002; Goldsmith, Goldsmith, & Heaney, 1997).

Current Study

The present study analyzed the degree to which a composite measure of financial knowledge was associated with what might be considered best practice financial behaviors. Given the available evidence, it was hypothesized that more knowledgeable consumers would display more responsible financial behaviors (i.e., have significantly better scores on a composite measure of best practice behavior). This relationship was assumed to hold for both objective and subjective knowledge measures. The present analysis should shed light onto the strength of these hypothesized differences. If more knowledgeable consumers exhibit more responsible financial behaviors, to what extent are they different from their less knowledgeable peers? Further, what differences appear to exist provided the type of knowledge measure used (objective versus subjective)?

Financial knowledge was proposed as an element of personal financial wellness in a conceptual framework that includes financial satisfaction, financial behavior, financial attitudes, and objective status measures (Joo, 2008). In this framework, financial knowledge, along with financial attitudes, was grouped together under the umbrella of "Subjective Perception." An extraction of this conceptual framework is presented in Figure 1.

Figure 1. Extract of Joo's (2008) Financial Wellness Diagram



Data

The Financial Industry Regulatory Authority (FINRA) is a self-regulatory agency formed from the former National Association of Securities Dealers (NASD) and certain regulatory functions formerly performed by the New York Stock Exchange (NYSE) in 2007. The FINRA Investor Education Foundation, or FINRA Foundation, exists to provide education to underserved populations regarding the skills, knowledge and tools required to achieve financial literacy. In 2009, the FINRA Foundation, in conjunction with the U.S. Department of the Treasury, conducted the National Financial Capability Study in order to assess Americans' ability in dealing with four key components of financial capability. These are: making ends meet, planning ahead, managing financial products, financial knowledge and decision-making.

The National Survey, released in December 2009, was the first of three linked studies that constitute the National Financial Capability Study. Elements to be released at a later date are a state-by-state survey and a military survey. The current study used data from the National Survey, which was conducted in mid-2009 using a national sample of 1,488 respondents via a digit-dialed telephone survey.

Method

This study examined the relationships between financial knowledge, financial satisfaction, self-assessed confidence in financial matters, and demographic factors in determining the degree to which respondents participated in financial behaviors that can be identified as best practices. The statistical technique of linear regression was used with best practice behaviors as the dependent variable. Three scales were created in order to facilitate the analysis. These were examined in detail below, and were comprised of the financial knowledge, self-assessed competence and best practices elements of the study.

Financial Knowledge

The FINRA Financial Capability Survey asked five questions relating to financial knowledge. Three of the questions were developed by Lusardi and Mitchell for the 2004 wave of the Health and Retirement Survey and have been used in many subsequent studies (Lusardi, Mitchell, & Curto, 2010). Two additional questions complete the battery for the FINRA Financial Capability Survey.

- **Compound Interest:** Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you

would have in the account if you left the money to grow? Correct answers recoded to 1, all others are assigned a value of 0.

- **Inflation:** Imagine that the interest rate on your savings account was 1% per year, and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? Correct answers recoded to 1, all others are assigned a value of 0.
- **Bond Pricing:** If interest rates rise, what will typically happen to bond prices? Correct answers recoded to 1, all others are assigned a value of 0.
- **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. Correct answers recoded to 1, all others are assigned a value of 0.
- **Diversification:** Buying a single company's stock usually provides a safer return than a stock mutual fund. Correct answers recoded to 1, all others are assigned a value of 0.

For the purposes of the present analysis, an additive scale was constructed using a respondent's answers to the five financial knowledge questions. Potential values ranged from 0 to 5. Reliability analysis indicated a Cronbach's coefficient alpha of .556 for this measure.

Self-assessed Financial Confidence

Four questions were asked of respondents regarding their own assessment of their financial skills and knowledge. Respondents were asked to agree or disagree with a statement according to a 7-point Likert-type scale with 1 indicating "Strongly Disagree," 4 indicating "Neither Agree nor Disagree," and 7 indicating "Strongly Agree." Answers of "Don't Know" or refusals were recoded to 0 values. This occurred with less than 0.5% of respondents. The four questions read as follows:

- "I am good at dealing with day-to-day financial matters such as checking accounts, credit and debit cards, and tracking expenses."
- "I am pretty good at math."
- "I regularly keep up with economic and financial news."
- "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?"

A scale was constructed based on the average value of the answers to these four items. Values ranged from 0 to 7. Reliability analysis indicated a Cronbach's coefficient alpha of .663.

Best Practices

Six financial planning best practices were identified with the intent of selecting those practices that most closely correlated to financial knowledge. The practices were selected for their applicability to the major areas of financial planning: personal finance basics, borrowing, saving/investing, and protection (Huston, 2010). The six financial best practices are described as follows, and their derivation from the survey data is explained.

- **Emergency Fund:** Have you set aside emergency or rainy day funds that would cover your expenses for 3 months in case of sickness, job loss, economic downturn, or other emergencies? Answers of 1 = Yes recoded to a value of 1. All other answers are assigned a value of 0.
- **Credit Report:** In the past 12 months, have you obtained a copy of your credit report? Answers of 1 = Yes recoded to a value of 1. All other answers are assigned a value of 0.
- **No Overdraft:** Do you or your spouse/partner overdraw your checking account occasionally? Answers of 2 = No recoded to a value of 1. All other answers are assigned a value of 0.
- **Credit Card Payoff:** In the past 12 months, which of the following describes your experience with credit cards? – I always paid my credit card balances in full. Respondents who always paid balances in full recoded to a value of 1. All other answers are assigned a value of 0.
- **Retirement Account:** Do you (or your spouse/partner) have any retirement plans through a current or previous employer, like a pension plan or a 401(k)? Or do you (or your spouse/partner) have any other retirement accounts NOT through an employer, like an IRA, Keogh, SEP or any other type of retirement account that you have set up yourself? Respondents who answered 1 = Yes to either question recoded to a value of 1. All other answers are assigned a value of 0.
- **Risk Management:** The survey asks about four categories of risk management policies: health insurance, homeowner's or renter's insurance, life insurance and auto insurance. There was no ques-

tion regarding disability insurance. Because some individuals have no requirement for auto insurance or life insurance, respondents who indicated that they had at least two of the four policies in place recoded to a value of 1. All other answers are assigned a value of 0.

An additive scale was constructed based upon a respondent's participation in the six identified Best Practices. Values ranged from 0 to 6. Reliability analysis indicated a Cronbach's coefficient alpha of .635.

Financial Satisfaction

Financial satisfaction was measured using the response to a single question on the FINRA study. The question reads: "Overall, thinking of your assets, debts and savings, how satisfied are you with your current personal financial condition?" Respondents reply on a 1 to 10 scale, with 1 signifying "Not at All Satisfied" and 10 noting "Extremely Satisfied." The mean score was 5.625 with a standard deviation of 2.648.

Demographic Variables

A variety of demographic variables were included in the analysis given previous evidence. Data were collected regarding respondents' gender, race, ethnicity, income level, and education. Variable definitions and more details regarding coding are provided in Table 1.

Sample Characteristics

After the elimination of unusable values for key variables, the number of cases analyzed was 1,466. A slight majority of the respondents were female (51.5%). The median respondent was in the 35-44 age group, and most respondents reported receiving at least some education at the college level. The median income was reported at the \$35,000 to \$50,000 level. One third (33%) of respondents reported an unexpected decrease in household income in the previous 12 months, reflective of the 2009 time frame of the survey. About two thirds (63.8%) of respondents indicated being White, 12.4% Black, 13.4% Asian and Other, and 10.4% Hispanic.

Results

The initial analysis was a simple correlation of the measurements. The results of this analysis are shown in Table 2. Correlations between all variables were significant at the $p < .01$ level, although the relationship between financial knowledge and financial satisfaction was weaker than the others. One of the strongest relationships was found

Table 1. Sample Demographics (N = 1,466)

Variable	Category	n	%
Gender	Male	711	48.5
	Female	755	51.5
Age	18-24	204	13.9
	25-34	248	16.9
	35-44	282	19.2
	45-54	270	18.4
	55-64	220	15.0
	65 and over	242	16.5
Education	Did not complete high school	148	10.1
	High school graduate	402	27.4
	Some college	427	29.1
	College graduate	304	20.7
	Post graduate education	155	12.6
Income	Less than \$15,000	266	18.1
	\$15,000 to \$24,999	178	12.1
	\$25,000 to \$34,999	155	10.6
	\$35,000 to \$49,999	201	13.7
	\$50,000 to \$74,999	271	18.5
	\$75,000 to \$99,999	147	10.0
	\$100,000 to \$149,999	148	10.1
	\$150,000 or more	100	6.8
Race/ethnicity	White	935	63.8
	Black	182	12.4
	Hispanic	152	10.4
	Asian or other	197	13.4

Table 2. Correlation Analysis of Financial Measures (N = 1,466)

	Financial satisfaction	Financial knowledge	Best practices	Financial confidence
Financial satisfaction	---			
Financial knowledge	.096**	---		
Best practices	.361**	.379**	---	
Financial confidence	.302**	.291**	.387**	---

** $p < .01$ (two-tailed).

Table 3. Regression Results (N = 1,466)

Variable	Unstandardized coefficients		Standardized coefficients		
	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Constant	-.637	.166		-3.844	.000
Income	.300	.018	.391	16.463	.000
Financial confidence	.204	.029	.147	6.959	.000
Financial satisfaction	.103	.013	.162	7.923	.000
Education	.181	.032	.127	5.607	.000
Age group	.098	.020	.096	4.879	.000
Black	-.432	.099	-.085	-4.339	.000
Financial knowledge	.097	.027	.081	3.649	.000
Hispanic	-.227	.109	-.041	-2.089	.037

between financial knowledge and financial behaviors, or best practices.

Further analysis was conducted to determine if demographic factors were related to financial behavior as expressed by best practices. Multiple regression analysis was performed using best practices as the dependent variable with financial satisfaction, financial knowledge, financial confidence, and the demographic variables relating to age, income, education, and race/ethnicity as independent variables. Variables were introduced into the model using the stepwise method, with .05 set as the inclusion criteria, and .10 as the removal criteria. Results of the modeling exercise are presented in Table 3. The final model produced an $R^2 = .474$ $F(8, 1457) = 164.412$, $p < .01$, indicating that 47.4% of the variance among respondents was explained by the variables in the model.

Discussion

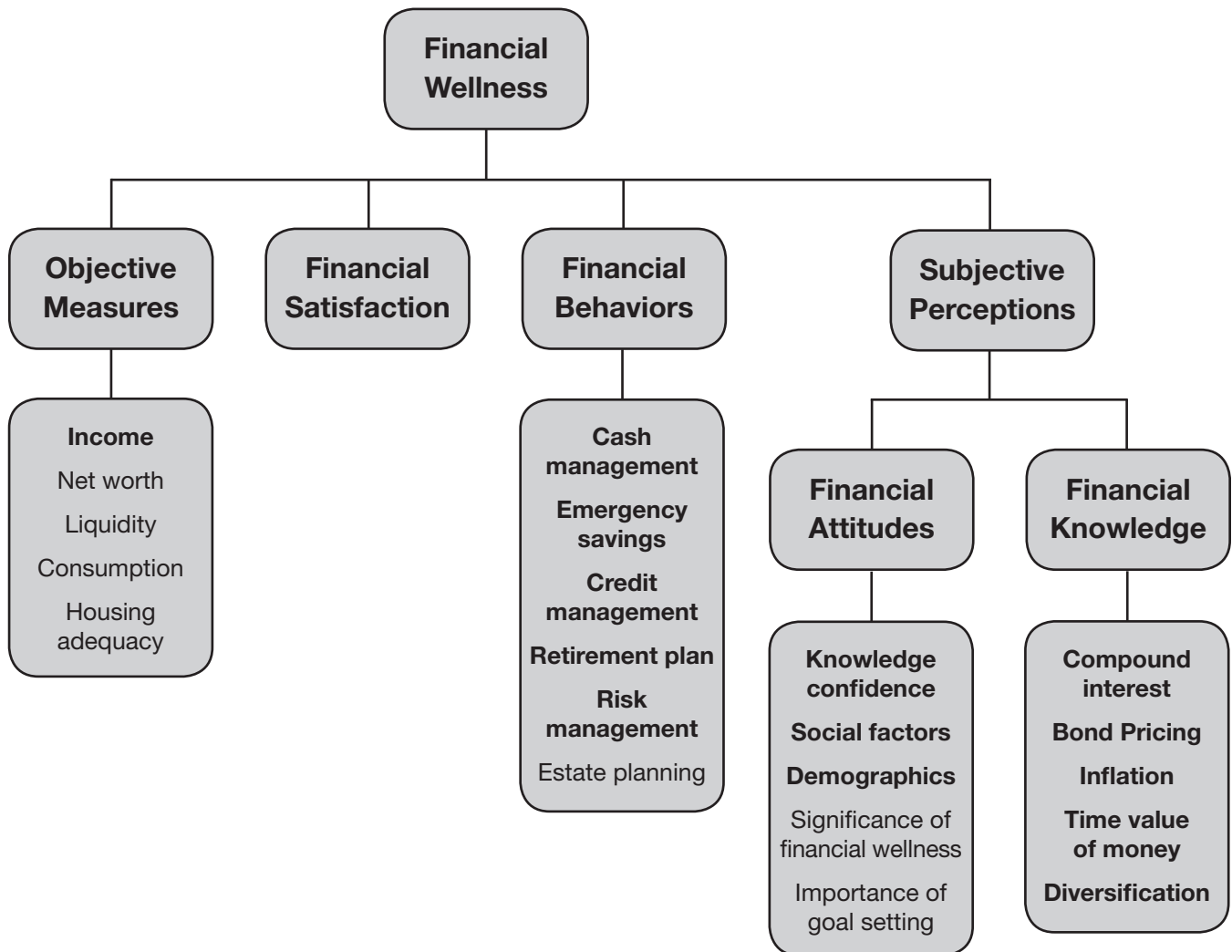
As hypothesized, personal financial knowledge has a significant impact on financial behaviors as they are measured in the present analysis. Despite its significant impact, objective knowledge is not the dominant factor. Income has the most significant impact on financial behavior, followed by financial satisfaction, financial confidence (subjective knowledge), and education. Knowledge is clearly an important component in financial decision-making, but other factors play a significant role as well. These findings are

supportive of other research that suggests that knowledge alone is insufficient to ensure better financial behavior (Braunstein & Welch, 2002; Perry & Morris, 2005).

The current findings suggest that objective knowledge may not be the most important factor in determining whether individuals make good financial decisions or not. The relative strength of subjective (or self-assessed) financial knowledge is supportive of previous findings by Courchane (2005). This variable is interesting because of the fact that much of the available research suggests that consumers generally do not have a great understanding of their own level of financial knowledge. When objective and subjective knowledge were measured comparatively, more than half of those individuals who believed that they had a fair amount of financial knowledge actually had very little (Courchane, 2005). The present analysis supports these findings as financial knowledge (objective) and financial confidence (subjective) display a low level of correlation and both have a significant impact on behavior.

Research in the area of behavioral finances analyzes the concept of overconfidence, whereby investors make poor decisions because of the fact that they think they know more than they do. The present findings (and the previous literature) indicate that this may not be as much of a problem for the general financial behaviors analyzed. For the present study, consumers who are more confident in re-

Figure 2. Variables Captured in the Present Study (in bold)



Note. Variables in bold were captured in this study. Other variables were not in the data set but are worthy of consideration for inclusion.

gards to their own financial knowledge actually engage in more favorable behaviors. It should be noted that previous studies of overconfidence analyze variables that differ significantly from the present analysis. Observed differences in the impact of confidence may simply be a result of different models and dependent variables.

The dominance of income is not surprising given the structure of the dependent variable. Certain negative financial behaviors, such as an overdraft on a checking account or failing to pay off a credit card, may be the result of income constraints. It is also unsurprising that consumers who en-

gage in more responsible financial behaviors are more satisfied financially. It is generally expected that financial satisfaction would be enhanced by a lack of financial problems. Unfortunately, the present study is unable to analyze causal effects due to the cross sectional nature of the sample. We can observe the fact that higher financial confidence, knowledge, and satisfaction are associated with better financial behavior, but we do not know why this might be the case. While there is evidence that some behavioral improvement may result based solely on knowledge improvement, questions remain as to the magnitude of this effect and what methods of knowledge improvement are most

effective. Our inability to explain the causal aspects of the relationship between knowledge and behavior remains one of the largest gaps in the literature and should be considered a priority for researchers and funding agencies going forward. Without a rich, longitudinal dataset that includes relevant measures of knowledge and behavior, this issue is likely to persist. Whereas individual researchers can work at collecting their own samples, such efforts may be ultimately more work than they are worth based on concerns related to representativeness and methods of measurement. Going forward, funding support for a data collection, such as the one described, may be the most productive use of available resources.

The present study works within a previously proposed conceptual framework for the study of financial wellness (Joo, 2008). Whereas the present model does not allow for the exploration of all the possible elements, strides have been made in the examination of relevant elements of financial behavior and financial attitudes, as well as the objective measure of income. Figure 2 indicates the breadth of topics explored in this study in boldface type, and offers other potential variables for expanding the knowledge in this topic area and completing the model.

Policy Implications

The present findings are generally supportive of the notion that level of financial knowledge does have an impact on financial behavior. One of the greatest hurdles for researchers at the present time is a general lack of data. As noted in the discussion of limitations, a true examination of causality will remain unlikely without broad support from the government or some other major funding source(s). Emphasis needs to be placed on programs that collect detailed qualitative and quantitative data over time. With all of the attention that financial literacy has received in recent years, it is surprising that there has not been more energy directed at improving this issue.

Many states have begun to place an emphasis on financial literacy and the development of key financial skills, but the present findings suggest that programs centered on objective knowledge alone may be ultimately less effective. Further, policy questions remain as to how knowledge might best be improved. In general, education may only be effective if it is targeted and relevant. A more holistic program of financial education (made possible by the adoption of standards, accepted curricula, and outcomes assessment) from middle school to college may be a reasonable starting point, as long term programs may help consumers to develop good financial habits at an early age.

The present study supports the prior literature, as evidence suggests that information alone is not enough and consumers are more likely to engage in improved behavior when good decisions are made easier. This is the logic at work behind the Save More Tomorrow plan of employee savings (see Thaler & Benartzi, 2003). Consumers may be limited in their capacity to engage in disciplined financial behaviors, and programs should be designed to acknowledge this shortcoming. The current economic climate places an increasing burden on individual decisions related to retirement and healthcare planning, risk management, and emergency planning. Policy makers, both public and private, must be aware and provide resources that facilitate these decisions as they are undertaken by their consumers, employees, and other constituents. The current findings suggest that financial confidence is an important factor in determining whether or not consumers engage in select recommended practices (i.e., confident consumers are willing to take action). Providing clear documentation and available support at the time when individuals are making decisions regarding retirement allocations or health care may go a long way towards encouraging better behavior among consumers.

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