Financial Behaviors Before and After the Financial Crisis: Evidence from an Online Survey

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This study investigated the performance of 20 financial practices before and after the recent global financial crisis. Data were obtained from an online financial self-assessment tool using responses collected from January 2005 through December 2010. The 10,661 respondent sample was divided into pre- and post-December 31, 2007 cohorts for purposes of comparison. Significant time-period differences were found in a positive direction for quiz scores that indicated the frequency of performance of 12 financial practices and for the total score of all practices. After converting quiz items to three broad behavioral categories, scores for all three behaviors – budgeting, spending, and saving – were significantly higher after the financial crisis began.

Key Words: financial behaviors, financial crisis, financial practices, online survey, recession

Introduction

This study was conducted to empirically test consumers' performance of 20 recommended financial practices before and after the recent global financial crisis. Since the financial crisis took hold in the late 2000s, various post-crisis outcomes have been predicted. Economists have forecast slow economic (GDP) growth, tight credit, meager investment returns by historical standards, deflation, inflation, high numbers of "underwater" homes and home foreclosures, and/or continued high unemployment in both the public and private sector (Hughes & Seneca, 2009; Riepe, 2009; Zuckerman, 2010). Some pundits have used the term "new normal" to describe the changed U.S. economic landscape (Term of the Month, 2009). An important reason why conditions have changed significantly is that the financial crisis was precipitated by unsustainable bubbles (e.g., housing prices) and underpriced risk (e.g., credit default swaps). At the micro level, U.S. households have been deleveraging their debt balances and increasing their rate of precautionary savings as a percentage of household income (Healy, 2009; Personal Savings Rate, 2010). In addition, more than half of working adults reported experience with unemployment, a cut in pay, a reduction in work hours, or involuntary part-time employment (Taylor et al., 2010).

The term "Great Recession" has been used to describe recent economic events (Zuckerman, 2010). The current study compared differences in personal financial management practices in two time periods: January 1, 2005 through December 31, 2007 and January 1, 2008 through December 31, 2010. The data were separated this way because the National Bureau of Economic Research (NBER) declared the U.S. in a recession beginning December 2007 based on key economic indicators (NBER Makes It Official, 2008). House prices fell about 9% in 2007 and stock market indices that peaked in October 2007 began to trend downward (Bricker, Bucks, Kennickell, Mach, & Moore, 2011).

While the "Great Recession" was declared over by the NBER in June 2009, it has not felt like it to many who experienced unemployment and other losses. By December 2008, fears of another Great Depression were being discussed in opinion polls as more people were being negatively affected by the economic downturn as workers, investors, and homeowners (Riepe, 2008). Unemployment rose to 7.4% by the end of 2008 and, over the course of the year, house prices declined 17% and the Wilshire 5000 stock index fell 39%. Unemployment subsequently rose to 10% by the end of 2009 (Bricker et al., 2011), and the labor market continued to struggle in 2010 and 2011.

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Literature Review

Since the current study compared financial behaviors before and during the financial crisis, the literature review focuses on recent studies of the financial practices of U.S. households, both during and preceding the financial crisis. The review also includes information about how individuals react to crisis events in general and studies of responses to financial crises in particular.

Post-Financial Crisis Financial Practices of U.S. Households

Studies of the impact of the 2008-2010 economic crisis on the financial management practices of U.S. households have just started to emerge. One of the most comprehensive was a study conducted of financial crisis impacts between January 2008 and June 2010 by Pew Research Center with 2,967 respondents (Taylor et al., 2010). The study found that 62% of Americans reduced their spending since the recession began in December 2007 and 48% said they were in worse financial shape than before the recession. Four in 10 respondents with savings or a retirement account made withdrawals to pay their bills, and 71% said they had bought less expensive brands to help make ends meet. In another study of post-crisis financial behavior, conducted by the University of Arizona with 748 college students in spring 2009, a variety of impacts upon students' lives were identified. Students' responses to the financial crisis included an increase in risky coping strategies (e.g., leaves of absence, dropped classes, postponed health care) and significantly more responsible budgeting behaviors (Shim & Serido, 2010).

Another recent study (Financial Capability, 2009), conducted by the FINRA Investor Education Foundation after the financial crisis began, found that nearly half of 1,488 respondents reported difficulty paying monthly expenses and bills and a majority did not have funds set aside for emergencies or savings for predictable life events (e.g., retirement). Only 49% of respondents reported that they had set aside funds sufficient to cover expenses for three months. Across all age groups up to age 60, one third of respondents reported they were not saving. In addition, nearly one quarter (23%) of the sample engaged in high-cost "alternative" forms of borrowing (e.g., payday loans, tax refund loans, pawn shops, rent-to-own stores). The 2009 MetLife Study of the American Dream (2009) was also conducted during the height of the financial crisis and included 2,243 online responses. One of the key findings of this study was a marked shift in consumer focus from material accumulation to near-term survival. Respondents reported paring spending (e.g., restaurant meals and vacations) and focusing more on personal relationships. Nearly half of the respondents, and 66% of those born before 1946, said they already had all the possessions they needed. More ominously though, half of the sample said they could only meet their financial obligations for one month if they lost their job.

Another comprehensive analysis of the effects of the financial crisis was a 2009 follow-up Federal Reserve Board study (Bricker et al., 2011) of families that participated in the 2007 Survey of Consumer Finances (SCF). The 2007 data were collected just as the economy started to turn down and re-interviews took place between July 2009 and January 2010. Information from the two pairs of interviews from the two years provided a unique measure of how families were affected by the financial crisis. The study found that most families (63%) experienced losses in wealth, and the median percentage change was an 18% decrease from 2007 levels. A sizeable fraction of households also experienced gains in wealth. Declines in home equity and in the value of stock and business equity were two important components of overall declines in wealth, and the wealthiest households took the largest hit. Younger respondents had the smallest declines in wealth. The largest dollar decline was for primary residences. Real median household income also declined slightly from $50,100 to $49,800 for families surveyed in the 2007 SCF panel, and median total debt rose from $70,300 to $75,600. The majority of households sampled passively accepted changes in their portfolio driven by changing asset prices. They also reported a desire for less risk and for higher precautionary savings, both indicators of increased cautiousness (Bricker et al., 2011).

The Fourth Annual Saving Assessment, sponsored by *America Saves* and the American Savings Education Council, surveyed over 1,000 American adults in early February 2011 and found that Americans are still struggling financially (Fourth Annual Saving Assessment, 2011). The percent who said they are "very concerned" about the impact of the recession on their finances was 49%, up from 43% in 2010. On a more positive note, the number of households taking action to improve their savings and save for retirement increased from the prior year. The proportion with a saving plan rose from 55% to 57%, those saving for retirement at work rose from 49% to 54%, and those saving automatically outside of work rose from 41% to 44%. The study also found that households with a savings plan were far more likely to spend less than their income (88% versus

50%), reduce consumer debt or be debt free (87% versus 69%), have sufficient emergency savings (85% versus 50%), and save for retirement (61% versus 27%) than those without a plan (Fourth Annual Saving Assessment, 2011).

Pre-Financial Crisis Financial Practices of U.S. Households

Several earlier studies also shed light on the financial practices of U.S. households. A study for Bankrate.com by RoperASW (Bankrate Survey, 2004) found a substantial gap between what people know and what they do. For example, 71% of 1,000 respondents said that keeping an emergency fund is "very important" but just 44% said they always have one at hand. The gap between "attitude and action" was even larger for preparing a will and shopping around for insurance coverage. The researchers also concluded that Americans scored higher on routine practices, such as paying bills on time, but are not as adept at tasks that require analysis, calculation, and/or comparison or do not need to be done frequently. Hogarth, Hilgert, and Schuchardt (2002) reported similar results from a national survey of 1,004 respondents who were asked about financial product ownership and financial management behaviors. Almost nine in 10 (89%) had a checking account and 80% had a savings account. Frequencies for other financial practices were as follows: 88% pay bills on time, 67% balance their checkbook monthly, 65% have a record-keeping system, 53% spread their money across several types of investments, 49% save/invest money out of each paycheck, 49% pay credit cards in full each month, 46% use a spending plan or budget, 40% calculated their net worth in the past two years, and 36% plan and set goals for the future.

O'Neill and Xiao (2006) analyzed 2,155 responses to the same online quiz used to collect data for the current study. Six financial practices with the lowest frequency of performance were having a current will, having written financial goals with a date and dollar cost, calculating net worth annually, having at least three months expenses set aside in a readily accessible account, having a written plan (budget) for spending and saving money, and earning an after-tax yield on savings and investments greater than the rate of inflation. Similar to findings from an earlier study (O'Neill & Xiao, 2003), males had higher mean quiz scores than females and older respondents had higher scores than younger ones. Differences by income, education, and ethnicity were also found as well as three "disconnects" between related questions (e.g., average scores for having money to pay for an emergency and actually having at least three months' expenses set aside).

Crisis Theory and Financial Crises

Since the current study compared financial practices before and after the start of the financial crisis in the U.S., literature relating to how people respond to a crisis is included. Crisis theory contends that a crisis occurs when the difficulty and importance of a problem are larger than the resources available to deal with it (Caplan, 1964). A crisis can be viewed as a transitional period that presents both opportunities for growth and maturation and the risk of adverse affects, especially when individuals and families lack adequate coping skills and resources. Crises can be caused by trauma and developmental transitions, among other causes, and have identifiable beginnings, middles, and endings. Crisis theory has traditionally been applied to treatments of acute states in the physical and mental health care field but can also apply to severe financial distress.

According to Caplan (1964), a crisis is a threat to homeostasis or baseline functioning where an individual's equilibrium and normal and familiar coping mechanisms are overwhelmed by the circumstances. Equilibrium restoring actions that previously worked well often fail. Crises can affect many people (e.g., recessions, floods, and earthquakes) or individuals (e.g., unemployment, death, or divorce). According to crisis theory, an active crisis state may last four to six weeks, resulting in confusion and disorganization. A person will either adapt at this point and develop new coping skills or decompensate (not adapt) to a lower level of functioning (Crisis Theory & Intervention, n.d.). If a crisis is handled successfully, a person will become more mature as a result. If a crisis is not overcome, one or more negative outcomes are likely to result. Parad (1971) noted that the crisis is not the event itself, but rather an individual's perception of, and response to, the situation. Not all traumas result in someone entering a state of crisis.

A common cause of crisis is financial distress caused by events such as furloughs, pay cuts, disability, or the loss of a job. Voydanoff (1984) found several types of coping behaviors were used when economic distress occurred including financial management (e.g., juggling bills), family-related decision-making (e.g., moving to less costly housing), and definitional coping (e.g., perceiving unemployment as an opportunity). Varcoe (1990) found that the most prevalent methods of coping with financial stress were to withdraw money from savings and decrease variable household expenses.

More recently, Bricker et al. (2011) found the most commonly reported family financial challenge was maintaining income or employment and that there was a greater desired level of household buffer savings by many households in 2009 than 2007. Families in all wealth groups and across the range of changes in wealth expressed a need for greater precautionary savings. These findings indicate a level of caution being taken by many households during the late 2000s to prepare for a potential crisis. In addition, data from the U.S. Department of Commerce (2011) confirmed a rising U.S. savings rate during the six years that data for the current study were collected. At specific points in time, U.S. savings rates were 1.9% in January 2005, 2.3% in December 2007, 5.6% in January 2009, 5.7% in January 2010, and 5.6% in December 2010.

Theoretical Model

The theoretical model for the current study is the Transtheoretical Model of Change or TTM (Prochaska, DiClemente, & Norcross, 1992), which describes five change stages ranging from lack of awareness about the need to change behavior (the pre-contemplation stage) to ongoing maintenance of a positive action such as contributing to a 401(k) or making regular purchases of shares in a mutual fund. The theory also describes 10 change processes related to the five change stages. The TTM has been used extensively in studies of health practices and addictions and has been adapted for use in financial education (Xiao et al., 2004; Xiao, 2008). While the current study did not use longitudinal data to assess financial behavior changes in specific individuals over time, the TTM is nonetheless a useful framework to view differences in financial practices of many people at different points in time before and during a major economic event.

Before someone can even think about changing their financial behavior, they will experience a change process called "consciousness-raising." This term means that they will begin to learn new facts, ideas, and tips that support the idea of making a positive change (e.g., saving money and reducing debt). Another early change process is called "dramatic relief." This term means experiencing negative emotions resulting from poor practices or current economic conditions (e.g., lack of savings and high unemployment rates). Stories about the problems and/or successes experienced by other people can be a powerful motivator to make financial behavior changes. A third change process that occurs early on in the change process is called "social liberation" by researchers. This term means realizing that social norms are changing in a way that supports a positive behavior change. In other words, "the writing is on the wall." An example is a workplace where workers have experienced pay cuts, pay freezes, furloughs, and/or layoffs that call attention to real or potential income losses and the need to save money, reduce debt, and live on less.

The current study operated under the hypothesis that the financial crisis was a "consciousness raiser" severe enough to prompt Americans to take action to improve their finances (i.e., move from the pre-contemplation, contemplation, or preparation stages of change to improved financial practices by changing and maintaining financial behavior in the action and maintenance stages). Thus, it was believed that there would be a number of significant differences between pre- and post-financial crisis behavior. Certainly, media reports in the late 2000s were instrumental in raising consciousness about the severity of the financial crisis, including emotional reports (i.e., dramatic relief) about job losses, high debt levels, home foreclosures, and stock market volatility experienced by U.S. households.

In addition, crisis theory was another relevant theoretical model for the current study. As noted previously, crisis is a temporary state of disequilibrium accompanied by confusion and disorganization. New skills and behaviors often need to be learned and/or practiced following a crisis to progress to improved post-crisis functioning. The current study operated under the hypothesis that the recommended financial practices included in the *Financial Fitness Quiz* (e.g., written spending plan, adequate emergency fund, and avoidance of impulse purchases) were coping mechanisms that respondents could use to either anticipate a personal financial crisis or attempt to regain control afterwards.

Methodology

Data were obtained from an online financial self-assessment tool, the *Financial Fitness Quiz*, using a 6-year data set that began in January 2005 when the economic outlook was relatively positive, included the "Great Recession" in between, and ran through December 31, 2010 when the official U.S. unemployment rate stood at 9.8% (Neuman, 2010). This data set, therefore, provided a unique opportunity to study the financial practices of thousands of individuals who accessed the online quiz during a very difficult period of time in U.S. economic history.

The *Financial Fitness Quiz* consists of 20 equally-weighted items (e.g., "I pay credit card bills in full to avoid interest charges") to which respondents are asked to select the response that best describes their frequency of performance of recommended financial management practices. Seventeen of the quiz items have the following 5-part Likert-type scale responses: always (5), usually (4), sometimes (3), seldom (2), and never (1). For the remaining three items (e.g., "I have a current will"), respondents are asked to respond with "yes" (5) or "no" (1). The *Financial Fitness Quiz* was first posted online as a pilot test for research purposes in 2001. The quiz was based on frequent financial planning recommendations (e.g., having written financial goals, an emergency fund of at least three months expenses, a current will, and a written spending plan/budget).

Total quiz scores ranged from 20 to 100 with higher scores indicating more frequent performance of the 20 recommended financial practices. One item, "I know my federal marginal tax bracket," while sounding like a knowledge (versus a financial behavior) question, was included because it assumes financial behavior (i.e., action is taken or not taken) to determine one's current tax bracket as marginal tax brackets are indexed for inflation and can change with tax laws and household income. The *Financial Fitness Quiz* has two primary purposes: to provide users with instant feedback on their financial practices, including recommended action steps, and to generate data to support ongoing empirical research about participants' financial behavior (O'Neill, 2003).

Sample

Data were drawn from a convenience sample of 11,540 online respondents to the *Financial Fitness Quiz* between January 1, 2005 and December 31, 2010. Respondents accessed the quiz through online searches and publicity about the quiz by Cooperative Extension agents, financial professionals, and media reports. After excluding non U.S. residents from the original sample, the sample size used in this study was 10,661. Sample sizes before and after December 31, 2007 were 5,440 and 5,221, respectively. Demographic characteristics are shown in Table 1. The sample was 59.6% female and 78.1% White compared to 50.7% and 79.6%, respectively, in the U.S. population (People Quick Facts, 2010). About half of the sample (48%) was under age 35, over a third (40%) was age 35 to 54, and the remaining 12% of respondents were age 55 and older. Respondents came from all 50 states.

The sample skewed higher than the U.S. population on educational attainment. Almost half (49%) of the sample held a bachelor's degree or higher and over a third (37%) held an associate's degree or had some college or vocational/technical school training. The remaining 14% were high school graduates or had some high school education. This compares to 29% of the U.S. population with a bachelor's degree or higher, 26% with some college or an associate's degree, and 45% with a high school diploma or less education (U.S. Census Bureau, 2010a).

Respondents' household income levels were closer to U.S. population characteristics. Over half (53%) earned less than $50,000, almost a third (33%) earned $50,000 to $99,999, and the remaining 14% earned over $100,000. According to the U.S. Census Bureau (2010b), the 2007 median income of U.S. households was $50,233. Bricker et al. (2011) reported a decline in the median income of the Survey of Consumer Finances panel from $50,100 in 2007 to $49,800 in 2009.

To examine if there were any differences in the demographic characteristics of respondents before and after the financial crisis started, Chi-square tests were conducted. Results indicated that all demographic variables showed differences at a significance level .05 except for race/ethnicity (see Table 1). For example, respondents who were male, younger than 25, with some college or a lower educational level, and with incomes lower than $25,000 or higher than $100,000 were more likely to take the quiz after December 2007 than before.

Results

Financial Fitness Quiz Scores

As shown in Table 2, scores of *Financial Fitness Quiz* items in both the pre- and post-crisis subsamples were remarkably consistent in both their numerical value and rank. For example, the five quiz items that ranked the highest, meaning they were most frequently performed, were the same in both groups. These items included (a) having a checking account with which to pay bills, (b) having enough money to pay mortgage/rent and other household expenses, (c) having adequate insurance to cover big unexpected expenses, (d) keeping organized financial records, and (e) avoiding impulse purchases. The five quiz items that ranked the lowest, meaning they were least frequently performed, included (a) having a written budget, (b) knowing one's federal marginal tax bracket, (c) having at least three month's expenses set aside for emergencies, (d) having written financial goals with a date and dollar cost, and (e) having a current will. These findings were consistent with those of O'Neill and Xiao (2006, 2003). For all but the highest score for having a bank account for bill-paying, post-crisis scores were slightly higher than pre-crisis scores, but the time period differences were relatively small.

The total quiz score was slightly higher in the post-crisis sample than the pre-crisis sample, but in both time periods, quiz scores averaged less than 70%. This finding was also consistent with previous research that used earlier *Financial Fitness Quiz* data sets (O'Neill & Xiao, 2006, 2003). In no previous analysis had the average quiz score exceeded 70, an indication that a number of commonly recommended financial practices were performed infrequently, if at all. Also notable was the fact that scores on the four questions related to saving, investing, and investment asset allocation and returns (#9, #12, #13, and #14) were remarkably similar in both the pre- and post-crisis samples.

Table 1. Characteristics of Pre- and Post-Financial Crisis Samples

Demographic characteristics	Total sample %	Pre-crisis sample %	Post-crisis sample %	X^2	*p*
Gender	10,660[a]	5,441[a]	5,219[a]	27.0905	< .0001
Female	59.64	62.07	57.12		
Male	40.36	37.93	42.88		
Age	10,660[a]	5,441[a]	5,219[a]	102.9111	< .0001
Under 25 years	22.95	19.50	26.54		
25-34 years	25.01	25.77	24.22		
35-44 years	20.98	23.49	18.36		
45-54 years	18.77	19.63	17.88		
55-64 years	9.95	9.52	10.40		
65 years or older	2.35	2.10	2.61		
Education	10,656[a]	5,441[a]	5,215[a]	16.3650	.0026
High school or lower	14.33	13.49	15.21		
Some college	25.51	24.63	26.42		
Associate degree	11.42	11.71	11.12		
Bachelor degree	28.04	29.33	26.69		
Graduate or professional degree	20.70	20.84	20.56		
Income	10,652[a]	5,441[a]	5,211[a]	61.8140	< .0001
Less than $25,000	25.16	23.01	27.40		
$25,000-$49,999	28.26	30.58	25.83		
$50,000-$74,999	21.49	22.57	20.36		
$75,000-$99,999	11.62	11.67	11.57		
$100,000 or more	13.47	12.17	14.83		
Race	10,657[a]	5,441[a]	5,216[a]	4.3946	.3552
African-American	9.27	9.23	9.32		
Asian	3.28	3.00	3.59		
Hispanic	4.66	4.47	4.87		
White	78.12	78.72	77.49		
Other	4.66	4.59	4.74		

[a] Sample size

Table 2. Comparison of Pre- and Post-Financial Crisis *Financial Fitness Quiz* Scores

Quiz questions	Pre-crisis score	Post-crisis score	*p*
1. I have a bank checking account (or credit union share draft account) with which to pay bills.	4.76	4.73	.3015
2. I have enough money each month to pay my rent or mortgage payment and other household expenses.	4.51	4.51	.8719
3. I have enough money to pay for an emergency, such as a large car repair.	3.60	3.67	.0073
4. I have written financial goals with a date and dollar cost (e.g., $10,000 for a car in 2008).	2.35	2.52	< .0001
5. I have a written plan (budget) for spending and/or saving my money.	2.87	3.07	< .0001
6. I keep organized financial records and can find important documents easily.	3.81	3.83	.3594
7. I know my federal marginal tax bracket (e.g., 15%).	2.84	2.85	.6345
8. I calculate my net worth (assets minus debts) annually.	2.63	2.78	< .0001
9. I save regularly for long-term financial goals, such as education for my children, a house, or retirement.	3.50	3.54	.1944
10. I have at least three months' expenses set aside in a readily accessible account (e.g., money market mutual fund).	2.79	2.97	< .0001
11. I increase my savings when I receive a salary increase.	3.16	3.33	< .0001
12. I have a personal investment account for retirement (e.g., 401(k), 403(b), IRA) other than a pension funded by my employer).	3.63	3.60	.3553
13. I have money spread across more than one type of investment (e.g., stocks, bonds, mutual funds, CDs).	3.27	3.29	.4371
14. The average after-tax yield of my savings and investments over the long term is greater than the rate of inflation.	3.06	3.01	.0640
15. I have adequate insurance to cover "big" unexpected expenses, such as a hospital bill, disability, or liability for damages to others.	3.95	4.04	.0010
16. I have a current will.	1.99	2.08	.0095
17. Less than 20 percent of my monthly take-home pay goes to my credit cards, student loans, and car payments.	3.47	3.54	.0107
18. I pay credit card bills in full to avoid interest charges.	3.46	3.63	< .0001
19. I comparison shop for major purchases by checking at least three sources.	4.01	4.05	.0492
20. I avoid impulse purchases and don't use shopping as a form of recreation.	3.71	3.79	.0017
Total Score	67.37	68.82	< .0001

Note. *N* = 10,661 except for the total score, Q10 and Q18. For total score, *N* = 10,659; and for Q10 and Q18, *N* = 10,660.

Table 3. Behavioral Categories, Individual Behaviors, and Factor Loadings

Behavior category		Individual financial behavior	Factor loadings
Budgeting	Q 5.	I have a written plan (budget) for spending and/or saving my money.	.66856
	Q 4.	I have written financial goals with a date and dollar cost (e.g., $10,000 for a car in 2008).	.65818
	Q 8.	I calculate my net worth (assets minus debts) annually.	.50958
	Q 6.	I keep organized financial records and can find important documents easily.	.40361
Spending	Q18.	I pay credit card bills in full to avoid interest charges.	.57756
	Q 2.	I have enough money each month to pay my rent or mortgage payment and other household expenses.	.56961
	Q17.	Less than 20 percent of my monthly take-home pay goes to my credit cards, student loans, and car payments.	.46946
	Q20.	I avoid impulse purchases and don't use shopping as a form of recreation.	.46376
	Q19.	I comparison shop for major purchases by checking at least three sources.	.45020
Saving	Q14.	The average after-tax yield of my savings and investments over the long term is greater than the rate of inflation.	.68975
	Q13.	I have money spread across more than one type of investment (e.g., stocks, bonds, mutual funds, CDs).	.68236
	Q10.	I have at least three months' expenses set aside in a readily accessible account (e.g., money market mutual fund).	.64200
	Q 9.	I save regularly for long-term financial goals, such as education for my children, a house, or retirement.	.64051
	Q 3.	I have enough money to pay for an emergency, such as a large car repair.	.57250
	Q 7.	I know my federal marginal tax bracket (e.g., 15%).	.50483
	Q11.	I increase my savings when I receive a salary increase.	.50137

Table 4. Mean Scores of Behavioral Categories Before and After the Financial Crisis: *T*-test Results

	Pre-crisis	Post-crisis	*p*	*N*
Budgeting	2.9190	3.0508	< .0001	10,661
Spending	3.8301	3.9013	< .0001	10,660
Saving	3.1724	3.2365	.0053	10,660

Note. *p*-values are based on *t*-tests.

Table 5. Scores of Behavioral Categories Before and After the Financial Crisis: Regression Results

	Budgeting		Spending		Saving	
	b	*p*	*b*	*p*	*b*	*p*
Intercept	2.5426	< .0001	3.3588	< .0001	2.5113	< .0001
After crisis	0.1175	< .0001	0.0680	< .0001	0.0546	.0055
Income 25k-50k	0.2617	< .0001	0.1428	< .0001	0.3836	< .0001
Income 50k-75k	0.4140	< .0001	0.2876	< .0001	0.7740	< .0001
Income 75k-100k	0.6530	< .0001	0.4124	< .0001	1.0960	< .0001
Income 100k or higher	0.8052	< .0001	0.4973	< .0001	1.3143	< .0001
Age 25-34	-0.1832	< .0001	-0.2097	< .0001	-0.3407	< .0001
Age 35-44	-0.2999	< .0001	-0.2280	< .0001	-0.3206	< .0001
Age 45-54	-0.2313	< .0001	-0.1227	< .0001	-0.0841	.0217
Age 55-64	-0.0290	.5054	0.0048	.8876	0.1375	.0013
Age 65 or older	0.2807	< .0001	0.2544	< .0001	0.5837	< .0001
Education: some college	0.0628	.0600	0.3793	< .0001	0.0442	.1794
Education: associate degree	0.1576	< .0001	0.4809	< .0001	0.1587	< .0001
Education: bachelor degree	0.2930	< .0001	0.5559	< .0001	0.4935	< .0001
Education: graduate degree	0.3207	< .0001	0.5810	< .0001	0.5131	< .0001
Race: African American	0.0003	.9932	-0.3792	< .0001	-0.3740	< .0001
Race: Asian	0.1931	.0006	-0.0540	.2209	0.1783	.0013
Race: Hispanic	-0.0962	.0426	-0.2105	< .0001	-0.2697	< .0001
Race: Other	0.0099	.8347	-0.1713	< .0001	-0.0995	.0331
N	10,661		10,660		10,660	
F	64.07		98.85		231.08	
p	< .0001		< .0001		< .0001	
R^2	.0978		.1433		.2810	
Adjusted R^2	.0963		.1418		.2798	

Note. *b* refers to parameter estimate, *p* refers to significance level. Reference categories are: income under 25k, age under 25, education: high school or lower, race: white.

Three "disconnects" between average scores on related quiz items, identified in O'Neill and Xiao (2006), persisted in the current study in both the pre- and post financial crisis time periods. This finding is also similar to disconnects between attitude and action in the Bankrate survey (2004). First, respondents were more likely to say that they have enough money to pay for an emergency, such as a large car repair (scores of 3.60 pre-crisis/3.67 post-crisis) than they have at least three months expenses set aside (scores of 2.79/2.97). Second, respondents were more likely to report saving regularly for long-term financial goals (scores of 3.50/3.54) than having written financial goals with a date and dollar cost (scores of 2.35/2.52), which would indicate the amount that they need to periodically save. Third, respondents were more likely to report having enough money to pay housing and other household expenses (scores of 4.51/4.51) than having a written plan (budget) for spending and saving (scores of 2.87/3.07). These findings indicate that respondents may think they are doing better than their actual financial behaviors indicate.

Time Period Differences in Financial Practices

Comparing self-reported financial practices between pre- and post-crisis respondents, the total score and 12 of 20 individual quiz item scores showed time period differences. Before- and after-crisis average total quiz scores were 67.37 and 68.82, respectively. As shown in Table 2, scores of 12 individual financial behaviors improved significantly after December 2007. These quiz questions were Q3 (having enough money to pay for an emergency), Q4 (having written financial goals), Q5 (having a written budget), Q8 (calculating net worth annually), Q10 (having at least three months' expenses set aside in a readily accessible account), Q11 (increasing savings when receiving a salary increase), Q15 (having adequate insurance), Q16 (having a current will), Q17 (less than 20% of monthly take-home pay going to credit cards, student loans, and car payments), Q18 (paying credit card bills in full to avoid interest charges), Q19 (comparison shopping for major purchases), and Q20 (avoiding impulse purchases and recreational shopping). The differences in the scores for each of these questions were small but significant.

To gain more insights about pre- and post-financial crisis time period financial behaviors, exploratory factor analysis was used to identify broader financial behavior categories. First, questions 1, 12, and 16 were excluded because they were binary variables. Among the 17 remaining financial behaviors, Q15 had low factor loading (< .4) in all factors and was excluded in further analyses. The resulting factor analysis identified three broad behaviors, which were labeled as budgeting, spending, and saving. Coefficient alpha reliability estimates for budgeting, spending, and saving were .76, .72, and .88, respectively. The behavioral categories, individual behaviors and corresponding factor loadings are presented in Table 3.

Three behavior category variables were constructed by using the average score of individual behavior variables within the three behavioral categories identified by the factor analysis. For example, budgeting = (Q5+Q4+Q8+Q6)/4. *T*-test results showed that all three broad behaviors, budgeting, spending, and saving behaviors, were different between time periods (see Table 4). In other words, the findings suggest that performance of budgeting, spending, and saving behaviors was better (i.e., done more frequently) after the financial crisis.

To examine if the period differences still existed after controlling for demographic variables, multivariate regressions were conducted by adding several control variables. Findings from regressions confirmed the results of the *t*-tests (see Table 5). After controlling for age, income, education, and race/ethnicity, post-crisis respondents tended to perform better in all three behavioral categories of budgeting, spending, and saving. In addition, income and education had positive associations with all three broad financial behaviors. The age group 25-54 tended to perform worse in all three broad behaviors compared to the under 25 age group. Racial differences were found in the three broad behaviors. Compared to Whites, Hispanics had worse performance in all behaviors, Blacks had worse performance in spending and saving behavior, and Asians had better performance in budgeting and saving behavior.

Summary and Discussion

In 2009, former White House Chief of Staff Rahm Emanuel said "You never let a serious crisis go to waste. And what I mean by that it's an opportunity to do things you think you could not do before" (Brainy Quote, 2010). While some have criticized this statement as sounding callous and self-serving during a time of financial uncertainty and high unemployment, it, nevertheless, has some truth. People often do change, because they want to or they have to, during difficult times.

The current study, using data from an online financial self-assessment tool, found modest evidence that the financial crisis was associated with pre- and post-financial crisis differences in the performance of frequently recommended financial management practices. Thus, hypotheses that the financial crisis provided an impetus for change processes associated with making positive financial behavior changes and using financial coping methods were somewhat supported. For some people, the recent economic downturn may have precipitated change processes (e.g., consciousness-raising, dramatic relief, and social liberation) associated with movement toward the action stage of change according to the Transtheoretical Model (TTM). However, many recommended financial practices were still performed infrequently after December 2007, average quiz scores remained at relatively low levels, and differences between pre- and post-crisis scores in a positive direction (i.e., indicating increased frequency of performance) were small.

Nevertheless, there was evidence of a modest positive difference in the performance of 12 financial practices following the December 2007 start of the Great Recession. Financial educators and counselors should be heartened to see a significant increased post-crisis frequency in the performance of 12 financial practices including written financial goals, written spending plans, having at least three months' expenses set aside for emergencies, payment of credit card bills in full to avoid interest, calculating net worth, and avoidance of impulse buying and recreational shopping. As noted above, however, given the small time period differences and relatively low scores on some quiz items, the practical significance of these relatively modest differences in scores is probably minimal. Time will tell if the improved financial practices take root over the long term.

Trends, such as reduced spending reported by Taylor et al. (2010), lack of emergency funds found by the FINRA study (Financial Capability, 2009), and macro-level data findings since 2008 (Financial Behavior Trends, 2009), were confirmed in this study of self-reported financial practices during a very tumultuous period in U.S. history. One notable positive time period behavior difference was the full payment of credit card bills. The financial crisis may have triggered greater receptivity to long-standing advice to pay credit card balances in full and avoid charging more than can be comfortably repaid. The positive difference in the practice, "I pay credit card bills in full to avoid interest charges," should be heartening to financial educators and counselors. Respondents may have been motivated to pay their credit card balances in full as a strategy to make themselves less "vulnerable" in the event of a layoff. Another possible explanation could be that they were charging less and that it is easier to pay off a smaller balance than a larger one (e.g., $50 vs. $500).

On the other hand, both pre-and post-crisis respondents had low total scores on the *Financial Fitness Quiz,* and there was no significant difference in eight financial practices. Of most concern to financial practitioners are the three items that had average scores less than three, meaning that a financial practice was seldom performed. These practices include having a will, calculating net worth, and having knowledge of one's federal marginal tax bracket, which is an important factor in investing and retirement planning decisions. Even some items that showed significantly higher post-crisis average scores (i.e., having written financial goals and a written budget) had relatively low scores in both the pre- and post- financial crisis subsamples.

This study has five limitations which constrain the generalizability of its findings. First, the sample was not randomly selected. Rather, it consisted of a convenience sample of Internet users who were interested in personal finance topics and visited the *Financial Fitness Quiz* Web page. Many were directed there by financial educators, including Cooperative Extension faculty. Second, the sample skewed higher on educational level than the general U.S. population and post-financial crisis samples used by Taylor et al. (2010) and the FINRA Financial Capability Study (2009). Third, respondents self-assessed their own financial practices and their scores could vary from an objective assessment by a neutral third party (e.g., financial advisor). Fourth, several quiz questions themselves skew toward higher income audiences and better economic times (e.g., "I increase my savings when I receive a salary increase"). The quiz does not ask about topics such as the earned income tax credit (EITC) and retirement savings tax credit for low- to moderate-income households and assumes that users understand financial terms such as "marginal tax bracket" and "after-tax yield." Lastly, question 20 is double-barreled. While the two sections of the question (avoiding impulse buying and shopping as recreation) are both related to reduced spending, the way the question is written could have affected the accuracy of respondents' scores.

These limitations aside, the findings of this study are still instructive. The data set was large and diverse and unique in that it captured the financial practices of individuals both three years before and three years after the official start date of the recent financial crisis. Because the global financial crisis and "Great Recession" are relatively recent events, this study is one of relatively few empirical analyses of their impact on the financial practices of individuals at the micro level.

Implications

Following are implications of this study for financial educators, counselors, and researchers:

- As observed previously by Hogarth, Hilgert, and Schuchardt (2002) and the Bankrate Survey (2004), financial practices that require analysis and calculation (e.g., preparing a net worth statement and written spending plan) were performed less frequently than others (e.g., paying monthly bills). Nevertheless, this study found a significant difference between the pre- and post- financial crisis samples in behaviors related to spending, budgeting, and planning. These findings indicate that the financial crisis may have precipitated greater attention to financial management tasks than in the past and that we are at a "teachable moment" for basic financial literacy skills as learners seek ways to cope with income and/or asset losses.

- Given that quiz scores are perennially low for financial practices that require analysis and calculation, it would be useful to know why. Obstacles to performance may be a lack of time or technical skill or both. If so, this suggests that there might be a market niche for some entity to perform an inexpensive annual financial "checkup" service for consumers and help them complete financial management tasks that they clearly do not do for themselves.
- The *Financial Fitness Quiz* itself can be revisited periodically by individuals and their financial advisors as a benchmark of financial performance. Ideally, people will want to see their scores rise over time. When respondents complete the quiz online, they are provided with a list of "action steps" (i.e., actions to address their low-scoring quiz items).
- A quiz item score that indicates a strong learning need is "I know my federal marginal tax bracket" (average score of 2.84). The current six federal marginal tax brackets have been the same since the 2001 tax law was enacted but this quiz item has consistently received a mediocre score (O'Neill & Xiao, 2006) since data started being collected in 2001. Knowledge of income taxes is a key component of investing and retirement planning (e.g., understanding that the tax benefit is $1,500 for a $6,000 IRA or 401(k) plan contribution made by someone in the 25% federal marginal tax bracket). As noted above, it takes periodic action for people to check their marginal tax bracket for changes due to indexing, changed tax laws, and changed household income. Apparently, many people are not doing this or do not know how.
- The item "I have a current will," continued to have the lowest average score on the *Financial Fitness Quiz*. Perhaps this is not surprising given that a high percentage of Americans die without wills and the fact that that almost half of the sample was under age 35. Still, the other half of the sample was over 35 and likely to have dependents and/or accumulated assets. Obstacles to developing a will (e.g., finding a lawyer, legal fees, fear of dying, and uncertainty about naming a suitable executor and/or guardian for minor children) need to be addressed openly in financial education programs.
- Results of the current study must be viewed in the context of the financial crisis. As findings from this study appear to indicate, an uncertain economic environment where many people have experienced reduced earnings or the loss of a job, may serve as a "trigger" to encourage people to perform commonly recommended financial practices (i.e., budgeting, spending, and saving) in an attempt to "control what they can" proactively and/or stabilize a financial crisis situation. Unfortunately, many life events are beyond our control. Perhaps the greatest financial need of many respondents and, indeed many Americans, right now is a stable job with benefits that pays a salary comparable to what they were earning before the financial crisis began.
- It is troubling that a relatively well-educated sample reported infrequent performance of many commonly recommended financial practices, even after the onset of the financial crisis. This may reflect negative impacts of the financial crisis itself (e.g., respondents had less available income to save) or simply provide evidence that behavior change is difficult at any time. Regardless, it is worth considering that, if people with the advantage of higher education and middle-class incomes were not performing recommended financial practices, how others with fewer resources must be faring in the wake of recent economic events.

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