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Employees' financial behaviors following the 2007–2009 financial crisis

Crystal Hudson, Ph.D.[a,*], Wookjae Heo, Ph.D.[b], Heejung Park, M.S.[c], Lance Palmer, Ph.D., CFP[d]

[a]*Clark Atlanta University, 223 James P. Brawley Drive, Atlanta, GA 30314, USA*
[b]*South Dakota State University, Box 2275A/Wagner Hall 151, Brookings, SD 57007-0295, USA*
[c]*University of Wyoming, Department 3275, 1000 E University Avenue, Laramie, WY 82071, USA*
[d]*University of Georgia, 205 Dawson Hall, Athens, GA 30602-2622, USA*

Abstract

Low- and middle-income employees make up the bulk of potential participants in employer sponsored retirement plans; however, employers find it difficult to alter their savings behavior. Financial crises may have unintended positive effects on low-income employees' behavior. Therefore, this study examined the effect of the 2007–2009 financial crisis on employees' financial behaviors; through ordered logistic regression analyses of data from the Survey of Consumer Finances. Following the crisis, all employees' and low-income employees' savings behavior significantly improved. Moreover, all employees' cash flow management behavior improved following the crisis, while it had no effect on low-income employees' cash flow management behavior.

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1. Introduction

In 2013, only 40.8% of all American workers between the ages of 25 and 64 participated in an employer-sponsored retirement plan (Copeland, 2014). This low participation rate is

* Corresponding author. Tel.: +1-404-880-6413; fax: +1-(404)-880-6276.
E-mail address: crhudson@cau.edu (C. Hudson)

most likely because of employees' lack of financial literacy, lack of money management skills, and their inability to save for the future (Lusardi & Mitchell, 2011). Employees need a certain level of financial literacy to manage their financial affairs in today's ever-changing financial environment (Braunstein & Welch, 2002; Hogarth, Beverly, & Hilgert, 2003; Loibl & Hira, 2005, 2006; Volpe, Chen, & Liu, 2006). Additionally, increased financial sophistication is necessary, as financial brokers sometimes push risky and complex financial products on unsuspecting consumers (Asaad, 2014; Lyons & Scherpf, 2004).

In 2013, only 16% of employees making less than $20,000 per year participated in an employer-sponsored retirement plan (Copeland, 2014). On average, lower income employees are particularly ill-equipped to navigate today's financial environment, or to make sound financial decisions to enhance their financial well-being, and they lack the financial knowledge and education needed to improve their financial situation (Andersen, Zhan, & Scott, 2004; Hudson & Palmer, 2014; Lusardi & Mitchell, 2005; Lyons, Chang, & Scherpf, 2006). Additionally, lower income individuals have always had challenges saving for emergencies and saving for retirement (Fisher, Hayhoe, & Lown, 2015). Opportunities to expand savings and improve cash flow management practices of employees could lead to greater retirement plan participation and savings rates. Thus, low-income employees can represent growth for this market if more is understood about their financial behavior.

The financial crisis from 2007 to 2009 provides an opportunity to examine whether financial behaviors changed among all employees, and specifically among low-income employees, as a result of external influences. In this crisis, real Gross Domestic Product (GDP) fell by 4.3%, while housing prices fell by 30% (Rich, 2013). Moreover, unemployment nearly doubled, from 5% in December 2007 to 9.5% in June 2009 (Rich, 2013). The 2007–2009 financial crisis hit most Americans the hardest in the form of unemployment, lost wealth, and housing insecurity (Bricker, Bucks, Kennickell, Mach, & Moore, 2011; Taylor et al., 2010). This dramatic financial event affected every American, either directly or indirectly, through close friends or family, and provided ample opportunities for deep reflection and evaluation of savings and cash flow management practices.

While a crisis could represent a threat to one's present well-being, it could also represent an opportunity for growth, mastery, and gains (Slaikeu, 1990). In other words, could an otherwise detrimental financial crisis have a positive effect on employees' financial behaviors? The purpose of this study was to examine the effects of the 2007–2009 financial crisis on employees' and low-income employees' savings and cash flow management behaviors. Thus, this research contributes to the literature by further identifying factors that influence organic financial behavior changes, including external factors like a financial crisis, and examining the persistence of such changes years after the external influence. From this, appropriate supports and systems can be put into place to further reinforce the intrinsic motivation to change financial behaviors.

Furthermore, while most previous studies explored the effects of a financial crisis on financial behaviors of the general population, this study is unique and adds to the body of literature by examining the effects of a financial crisis on employees' financial behaviors, because of their ready access to retirement plans and also adds to the body of literature by examining the effects of a crisis on low-income employees' financial behaviors, because of their low retirement plan participation and contribution rates. Having access to an employer-

based retirement plan gives employees a greater ability to save in comparison to the general population. Additionally, this research controls for household constraint by using poverty levels, which combine household size and income, rather than simple income measures. Multiple behaviors within the savings and cash flow management categories are measured providing a broader picture of behavior change.

2. Literature review

A review of previous studies found that a financial crisis positively affects financial behaviors (Bricker et al., 2011; Fidelity Investments, 2013; MetLife, 2009; O'Neill & Xiao, 2012; Taylor et al., 2010). Fidelity Investments (2013) conducted a study that examined financial behaviors after the 2007–2009 financial crisis by surveying the attitudes of 1,154 investors between 2008 and 2013. Fidelity's study found that the 2007–2009 financial crisis boosted the financial confidence of most investors (Fidelity Investments, 2013). In fact, more than half (56%) of investors reported feeling scared and confused as the crisis started, but otherwise reported being prepared and confident in their financial affairs after the financial crisis. Additionally, 42% of investors noted that they had increased the amount of their emergency funds and either sought financial advice from a financial advisor (30%) or financial advice from their spouse or family member (26%).

Likewise, O'Neill and Xiao (2012) examined the budgeting, savings, and spending behaviors of 10,661 randomly selected individuals who participated in an online survey from January 2005 to December 2010. Similar to this study, O'Neill and Xiao (2012) used a *t* test and multiple variate regression analysis to examine data before and after the 2007–2009 financial crisis. They found that the financial behavior of the respondents was better after the 2007–2009 financial crisis than before. Respondents reported increased budgeting practices, higher savings, and more positive spending behaviors after the financial crisis.

Similarly, other previous studies also acknowledged the positive effects that an otherwise stressful financial crisis can have on an individual's financial behaviors (MetLife, 2009; Taylor et al., 2010). In a MetLife (2009) online survey conducted in 2009, 2,243 participants were randomly selected from across the U.S. Thus, 75% of participants reported feeling stress about their financial situation or feeling insecure about their job stability during the 2007–2009 financial crisis. However, the majority of participants reported that the crisis was a wake-up call for them and motivated them to change their behaviors for the better (MetLife, 2009).

In March 2010, Pew Research randomly selected a national sample of 2,967 adults and interviewed them about how the 2007–2009 financial crisis affected their lives. Respondents felt that the 2007–2009 financial crisis led to a new frugality in American spending and borrowing (Taylor et al., 2010). Not surprisingly, participants reported eating out less or eating at home more often and also reported shopping at big box discount stores with more frequency. Additionally, most participants described having a positive attitude about their

finances, and most participants felt that their personal finances would improve in the coming year (Taylor et al., 2010).

3. Theoretical models

Previous studies have shown that financial behaviors change and are influenced by external and internal forces (Bricker et al., 2011; Fidelity Investments, 2013; MetLife, 2009; O'Neill & Xiao, 2012; Taylor et al., 2010). The Transtheoretical Model of Change (TTM) provides a theoretical framework of how people change, both on their own as well as when they work with a professional (Prochaska, DiClemente, & Norcross, 1992). Likewise, the Crisis Theory provides a theoretical framework of how individuals learn, adapt and grow after a crisis disrupts their normal lives (Caplan, 1971).

Several key processes of change within the TTM model contribute to cognitive reevaluation and perspective shifting, which in turn lead to outwardly observable behavior changes. The processes of consciousness-raising, dramatic relief, environmental revaluation, and social liberation can be triggered when an individual experiences or witnesses someone else going through a negative event, such as a financial crisis (Prochaska et al., 1992). Consciousness-raising is simply becoming more aware of certain behaviors and the effect those behaviors have on the individual and those with whom he or she associates. Furthermore, during the financial crisis, personal finance topics, such as savings and cash flow management, were a common topic of discussion in the news, which led to increased awareness of positive practices, such as saving and budgeting. Palmer, Bliss, Goetz, and Moorman (2010a, 2010b) found that even simple consciousness raising activities can lead to significant financial behavior changes. Dramatic relief simply refers to having an emotional response (i.e., feelings) when certain topics are discussed (O'Neill & Xiao, 2012). As unemployment, foreclosures, and bankruptcies abounded, and individuals experienced these things firsthand or indirectly, many likely developed strong emotions associated with basic personal finance vocabulary and practices. Finally, social liberation and self-reevaluation further accelerate the behavior change process as individuals recognize that society is more supportive and rewarding of positive financial behaviors, such as saving (social liberation; Xiao, Newman, Prochaska, Leon, Bassett, & Johnson, 2004). Opportunities for individuals to experience these cognitive processes of change abounded during the 2007–2009 financial crisis and likely led to widespread changes in consumer financial behavior.

The Crisis Theory is derived from the psychoanalytic theory and ego psychology and proposes that a crisis disrupts and causes chaos in an individual's life, but provides them with an opportunity to problem solve, adapt, and grow, and perhaps move to a higher state of being (Caplan, 1971; Woolley, 1990). Caplan (1971) defines a crisis as a threat to individuals' normal state of being or an obstacle to their important life goals. During a crisis, an imbalance exists and confusion as well as disorder ensues (Caplan, 1971). As this occurs, an individual makes many attempts to resolve this crisis, using known and new problem solving techniques, to maintain or restore balance (Caplan, 1971).

Thus, immediately following the crisis, as a state of disequilibrium occurs, an individual must find some way of coping with the crisis (Woolley, 1990). A new state

of equilibrium occurs, either at a higher level of functioning where growth has occurred, or at a lower level of functioning, where individuals have fallen to a regressed state of functioning (Woolley, 1990). As proposed by this study, a crisis presents individuals with an opportunity to problem solve, adapt, grow, and perhaps move to a higher level of being. Based on these theories and a review of literature, the four applicable hypotheses for this study are as follows:

Hypothesis 1: The overall savings behavior of all employees will be significantly improved after the 2007–2009 financial crisis versus before the 2007–2009 financial crisis.

Hypothesis 2: The overall cash flow management behavior of all employees will be significantly improved after the 2007–2009 financial crisis versus before the 2007–2009 financial crisis.

Hypothesis 3: The overall savings behavior of low-income employees will be significantly improved after the 2007–2009 financial crisis versus before the 2007–2009 financial crisis.

Hypothesis 4: The overall cash flow management behavior of low-income employees will be significantly improved after the 2007–2009 financial crisis versus before the 2007–2009 financial crisis.

4. Methodology

4.1. Data and sample

Data from the 2004 and 2013 Survey of Consumer Finances (SCF) were used for this study. These two years were selected because they were definitely before and after the financial crisis. The SCF, sponsored by the Federal Reserve Bank, is a triennial cross-sectional survey of U.S. families that is collected by the National Opinion Research Center (NORC), a research organization at the University of Chicago. The SCF includes descriptive information about a family such as location and household size, as well as financial information such as household income, assets, liabilities, expenses, and banking relationships. The SCF also provides information on a household's financial behaviors such as savings, spending and investing behavior. Most information within SCF represents the overall household. However, information that is pertinent to an individual, such as employment status, refers to the head of household. In a mixed sex marriage, the male represents the head of household; and in a same sex marriage the older individual represents the head of household (Federal Reserve, 2014).

A subsample of respondents was created by segmenting data by employment status. Among the 4,519 households within the 2004 SCF, 3,259 (72%) were employees. Among the 6,482 households within the 2013 SCF, 3,987 (62%) were employees. In total, 7,622 employees were included in this study; however, 376 employees failed to report their income, and therefore, only 7,246 employees were utilized in the analysis.

This larger employee sample was further segmented to create the low-income, middle-income, and high-income employee subsamples. These segments were based on income

Table 1 2013 income subsamples based on poverty levels

Household size	Low-income	Middle-income		High-income
	Less than 200%	Between 200 and 400%		Greater than 400%
1	$22,980	$22,980	$45,960	$45,960
2	$31,020	$31,020	$62,040	$62,040
3	$39,060	$39,060	$78,120	$78,120
4	$47,100	$47,100	$94,200	$94,200
5	$55,140	$55,140	$110,280	$110,280
6	$63,180	$63,180	$126,360	$126,360
7	$71,220	$71,220	$142,440	$142,440
8	$79,260	$79,260	$158,520	$158,520

Note: U.S. 2013 Poverty Level. Adapted from the 2013 Human Health Services Poverty Guidelines, by the U.S. Department of Health and Human Services, 2013 (available at http://aspe.hhs.gov/poverty/10poverty.shtml/).

and household size. Although all employees and low-income employee segments were the focal groups, middle-income and high-income subsamples were created for further comparison. Low-income employees are defined as employees with household incomes less than or equal to 200% of the U.S. poverty level. The U.S. poverty level is based on household size and income and the categorization of households in this research follows a similar design (Hudson & Palmer, 2014). Middle-income employees are defined as employees with household incomes between 200 and 400% of the U.S. poverty level, and high-income employees are defined as employees with household incomes above 400% of the U.S. poverty level. The poverty levels of household size and income are listed in Tables 1 and 2 for both 2004 and 2013 (U.S. Department of Health and Human Services, 2004, 2013).

The overall employee sample had more male respondents than female respondents in both 2004 and 2013. When this employee sample was segmented by income, the highest proportion of female respondents was observed among low-income employees in both 2004 and 2013, while the highest proportion of males was observed among high-income employees for both years. Furthermore, the employee sample primarily consisted of Whites in both 2004

Table 2 2004 income subsamples based on poverty levels

Household size	Low-income	Middle-income		High-income
	Less than 200%	Between 200 and 400%		Greater than 400%
1	$18,620	$18,620	$37,240	$37,240
2	$24,980	$24,980	$49,960	$49,960
3	$31,340	$31,340	$62,680	$62,680
4	$37,700	$37,700	$75,400	$75,400
5	$44,060	$44,060	$88,129	$88,129
6	$50,420	$50,420	$100,840	$100,840
7	$56,780	$56,780	$113,560	$113,560
8	$63,140	$63,140	$126,280	$126,280

Note: U.S. 2004 Poverty Level. Adapted from the 2004 Human Health Services Poverty Guidelines, by the U.S. Department of Health and Human Services, 2004 (available at http://aspe.hhs.gov/poverty/04poverty.shtml/).

Table 3 Savings and cash flow management variables

Variables	Measurements
Cash flow management behaviors	
Checking	= 1 if reported having a checking account; 0 otherwise
Loans on time	= 1 if reported paying loans ahead of time or on time; 0 otherwise
Spending	= 1 if reported spending was less than or equal to income; 0 otherwise
Savings behaviors	
Savings	= 1 if reported having a savings account; 0 otherwise
Save	= 1 if reported saving on a monthly basis; 0 otherwise
Autosave	= 1 if reported money automatically deposited in an account; 0 otherwise

and 2013. Thus, the highest proportion of White respondents was among high-income employees, while the highest proportion of Hispanic and Black respondents was among low-income employees.

The overall employee sample had more married individuals in both 2004 and 2013. When segmented by income, the highest proportion of married individuals was observed among high-income employees for both years. Furthermore, the employee sample primarily consisted of individuals who attained a high school degree or less for both 2004 and 2013, while the highest proportion of individuals with advanced levels of educational attainment was found among high-income employees for both 2004 and 2013 (see Table 4).

4.2. Financial behavior variables

Previous research has found that financial behaviors provide insight into an individual's financial knowledge and financial literacy (Hogarth et al., 2003). Based on Hogarth et al. (2003), this study used groupings of similar variables to develop composite financial behavior scores: (a) savings and (b) cash flow management. The savings category included three financial behavior questions: (a) "Do you save on a regular basis?" (b) "Do you have a savings account?" and (c) "Do you have money automatically deducted directly into an account?" Responses indicating positive financial behavior were coded as 1, and negative responses were coded as 0. An overall savings index was created from a summation of these three questions. Table 3 contains a detailed list and measurements of these variables, as well as all possible responses.

In the cash flow management category, three financial behavior questions were utilized in a similar fashion: (a) "Do you have a checking account?" (b) "Is your spending less than or equal to your income?" and (c) "Do you pay your loans on time?" Additionally, an overall cash flow management index was created from these three questions. Three control variables, race, education and age were included in this study. Race, a categorical variable, was included with possible responses of White (reference), Black, Hispanic, and Other race. Education, an ordinal variable, and age, a continuous variable, were also included in the regression analysis. Again, Table 3 contains a detailed list and measurements of these variables, as well as all possible responses.

Table 4 Socioeconomic characteristics, employees statistics (% of total), weighted

	Low-income employees		Middle-income employees		High-income employees		All employees	
	2004 (n = 629)	2013 (n = 987)	2004 (n = 789)	2013 (n = 1,002)	2004 (n = 1,841)	2013 (n = 1,998)	2004 (n = 3,259)	2013 (n = 3,987)
Sex								
Male	60.08%	62.18%	75.02%	77.64%	88.56%	87.50%	79.79%	78.75%
Female	39.92%	37.82%	24.98%	22.36%	11.44%	12.50%	20.21%	21.25%
Race/ethnicity								
White	57.09%	55.58%	72.96%	68.38%	82.38%	80.69%	75.22%	71.38%
Black	17.15%	20.09%	14.23%	14.28%	8.22%	6.92%	11.40%	12.03%
Hispanic	22.33%	21.43%	8.81%	13.53%	4.62%	5.07%	9.05%	11.25%
Other	3.43%	2.89%	4.00%	3.81%	4.78%	7.32%	4.33%	5.34%
Marital status								
Married	32.49%	35.90%	52.95%	53.06%	69.69%	66.44%	58.46%	55.52%
Single	67.51%	64.10%	47.05%	46.94%	30.31%	33.56%	41.54%	44.48%
Education								
Less than high school	80.50%	77.62%	68.61%	60.17%	37.48%	32.85%	53.32%	50.80%
Associate degree	5.28%	7.37%	7.34%	9.29%	7.73%	6.60%	7.16%	7.47%
Bachelor degree	9.79%	11.67%	17.54%	19.76%	29.98%	33.08%	23.07%	24.43%
Graduate degree	4.02%	3.28%	6.51%	10.48%	24.41%	27.10%	16.14%	17.03%
Certificate	0.40%	0.07%	0.00%	0.31%	0.39%	0.36%	0.30%	0.28%
Age								
18–30	31.24%	25.17%	20.90%	16.61%	9.59%	10.50%	16.51%	15.67%
31–50	44.90%	43.85%	57.23%	53.87%	54.77%	48.76%	53.46%	48.83%
51+	23.86%	30.98%	21.87%	29.53%	35.64%	40.73%	30.03%	35.50%

4.3. Statistical analysis

Descriptive statistics were generated to describe the demographic and socioeconomic characteristics of all employees, and the low-income, middle-income, and high-income employee subsamples. The distribution of all employees, and the low-income, middle-income, and high-income employees that responded affirmatively or negatively to each financial behavior was determined through a frequency analysis. An overall savings percentage and overall cash flow management percentage was created by combining the total affirmative responses.

An ordered logistic regression model was used to analyze data to determine if there was a significant change in savings and cash flow management behavior from 2004 to 2013. Data from the 2004 and 2013 SCF were combined, and the overall savings index and cash flow management index were calculated for all of the sample respondents. The primary independent variable was a binary variable used to indicate whether the savings and cash flow management indices were being measured before or following the financial crisis. Other control variables included race, education, and age.

Ordered logistic regression models were used to evaluate whether there was a significant difference in all employees' and low-income employees' savings behavior and cash flow management behavior. These two samples were the focal groups of this study, and their regression models were used to prove or disprove the study's hypotheses. Moreover, middle-income and high-income employees' savings and cash flow management behaviors were evaluated in the same manner as a method of comparison to low-income employees.

The ordered logistic regression model was utilized to analyze the relationship of a set of independent variables and an ordinal dependent variable. In this study, the ordinal dependent variables were the savings behavior index and cash flow management behavior index, with four possible ordered responses. The ordered logistic regression model is based on the assumption that outcome i corresponds to the probability that the estimated linear function is within the range of the cutoff points estimated by the outcome.

The probability odds models are as follows (Snedker, Glynn, & Wang, 2002):

$$\text{logit}(P1) = log\frac{P1}{1-P1} = \propto 1 + Bx1 \tag{1}$$

$$\text{logit}(P1 + P2) = log\frac{P1 + P2}{1 - P1 - P2} = \propto 1 + B'x1 \tag{2}$$

$$\text{logit}(P1 + P2 + \cdot\cdot\cdot Pk) = log\frac{P1 + P2 + \cdot\cdot\cdot Pk}{1 - P1 - P2 - \cdot\cdot\cdot Pk} = \propto 1 + B'x1 \tag{3}$$

Coefficients and odds ratios were generated for each independent variable to estimate the maximum likelihood of this independent variable (Snedker et al., 2002). If a significant positive relationship exists between the dependent variable of low-income employees' savings behavior index and the independent binary variable of the behavior occurring before

Table 5 Comparison of financial behavior frequency results, weighted

Behavior variables	Low-income			Middle-income			High-income		
	2004	2013	*p*	2004	2013	*p*	2004	2013	*p*
Mean of cash flow	1.99	2.08	<0.05[a]	2.37	2.48	<0.001[a]	2.69	2.70	>0.05[a]
Mean of savings	1.49	1.72	<0.001[a]	2.01	2.25	<0.001[a]	2.46	2.57	<0.001[a]

Note: Samples are 629 (low-income in 2004), 987 (low-income in 2013), 789 (middle-income in 2004), 1,002 (middle-income in 2013), 1,841 (high-income in 2004), and 1,998 (high-income in 2013).

[a]For mean comparisons (i.e., *t* test), alternative hypotheses are: mean value in 2013 is greater than mean value in 2004 (i.e., one-tail comparison).

the financial crisis or after the financial crisis, it would be interpreted as "low-income employees were x% more likely to report better savings behavior after the financial crisis than before the financial crisis." On the other hand, if a significant negative relationship exists between the same dependent and independent variables, it would be interpreted as "low-income employees were less likely to report better savings behavior after the financial crisis than before the crisis."

The RII technique was utilized to avoid analysis errors that may occur when using SCF data. The SCF contains five implicates, which are essentially five duplicate sets of data with substituted estimates for missing data (Montalto & Sung, 1996). This study's analysis accounted for the SCF complex sampling design (i.e., dual-frame complex sampling) and multiple imputation methodology (Federal Reserve, 2014).

5. Results

5.1. Financial behaviors comparison results

Preliminary results from the financial behavior frequency analysis found that the mean number of affirmative savings behaviors low-income employees engaged in during 2013 was significantly greater than the mean number of affirmative savings behaviors low-income employees engaged in during 2004. As shown in Table 5, low-income employees' mean reported affirmative savings behaviors was 1.72 for 2013 and 1.49 for 2004. Within the individual savings behaviors, the percentage of low-income employees who had a savings account, as well as those who reported having money automatically deposited into an account, appeared to be greater in 2013 (see Table 6). There were also significant differences in the mean number of affirmative savings behaviors between 2004 and 2013 for middle-income employees and high-income employees, with both groups showing improved savings behaviors (see Table 5). The proportion of individuals in both groups that had a savings account and had money automatically deposited into a savings account increased from pre-financial crisis to post-financial crisis (see Table 6).

Overall, the mean number of affirmative cash flow management behavior among low-income employees and middle-income employees increased from 2004 to 2013, while over the same

Table 6 Financial behavior frequency results, weighted

Behavior variables	Low-income		Middle-income		High-income	
	2004 (n = 629)	2013 (n = 987)	2004 (n = 789)	2013 (n = 1,002)	2004 (n = 1,841)	2013 (n = 1,998)
Cash flow management						
Do you have a checking account?						
Yes	76.59%	83.48%	91.68%	96.26%	99.14%	99.77%
No	23.41%	16.52%	8.32%	3.74%	0.86%	0.23%
Is your income equal to or less than your spending?						
Yes	75.32%	76.65%	77.08%	85.56%	88.78%	91.17%
No	24.68%	23.35%	22.92%	14.44%	11.22%	8.83%
Do you pay your loans on tine?						
Yes	47.74%	47.68%	65.36%	66.62%	81.87%	79.19%
No	52.26%	52.32%	34.64%	33.38%	18.13%	20.81%
Total cash flow management						
None	4.72%	3.38%	2.10%	0.39%	0.15%	0.01%
One	23.79%	18.40%	13.87%	8.13%	3.85%	2.66%
Two	38.59%	45.27%	31.84%	34.14%	22.06%	24.52%
Three	32.89%	32.96%	52.19%	57.34%	73.94%	72.81%
Savings						
Do you save on a regular basis?						
Yes	65.40%	67.74%	76.72%	80.26%	93.06%	91.23%
No	34.60%	32.26%	23.28%	19.74%	6.94%	8.77%
Do you have a savings account?						
Yes	35.42%	39.31%	56.81%	59.86%	69.75%	73.15%
No	64.58%	60.69%	43.19%	40.14%	30.25%	26.85%
Do you have money automatically deposited?						
Yes	47.79%	65.13%	66.77%	85.02%	83.67%	92.19%
No	52.21%	34.87%	33.23%	14.98%	16.33%	7.81%
Total savings						
None	17.46%	9.39%	6.89%	3.64%	0.84%	0.74%
One	33.80%	32.13%	20.44%	15.44%	9.99%	7.05%
Two	31.41%	35.40%	38.15%	33.07%	31.02%	27.11%
Three	17.33%	23.08%	34.52%	47.85%	58.15%	65.10%

period, the mean number of affirmative cash flow management behavior among high-income employees was unchanged (see Table 5). As shown in Table 6, the percentage of low-income and middle-income employees with checking accounts increased from 2004 to 2013, and for middle-income employees, in particular, a higher proportion in 2013 appeared to be spending less than or equal to their total income. Among high-income employees, there was relatively little change in the mean number of affirmative cash-flow management behaviors. Again, these results were simply preliminary results.

5.1. Ordered logistic regression results

Results from the ordered logistic regression analysis indicated that, following the crisis, employees were 53% more likely to report higher savings behaviors than before the financial

crisis, as shown in Table 7. Higher income households were more likely to exhibit higher overall savings behaviors. If households were to move from the low-income category to the middle-income category, they would be 126% more likely to exhibit higher overall savings behaviors. Hispanics were 48% less likely relative to Whites to report higher overall savings behaviors. Those with more education were also more likely to have higher overall savings behaviors.

When the ordered logit analysis was limited to specifically low-income employees, overall savings behavior followed similar patterns to that of the full sample. Low-income employees were 55% more likely to report higher savings behavior following the crisis (see Table 7). Hispanics were 55% less likely to report higher savings behavior relative to Whites, and those with higher educational attainment were 44% more likely to have higher savings behavior among low-income employees.

The savings behavior of middle-income employees following the financial crisis was significantly improved and indicated a strong positive association with education. Middle-income employees were more likely than low- and high-income employees to have higher savings behavior following the crisis. Hispanics were 40% less likely to report higher savings behavior than Whites among middle-income employees from 2004 to 2013.

High-income employees were also more likely to have higher savings behavior following the financial crisis. Among high-income employees, a racial gap was observed. Blacks were 30% less likely than Whites to have higher savings behavior. The racial gap between Blacks and Whites was not observed among low- and middle-income employees; rather, an ethnicity gap between Hispanics and Whites was observed among low- and middle-income employees.

Similar to savings behavior, all employees were 15% more likely to report better cash flow management behavior following the financial crisis (see Table 8). Increased income was associated with a higher likelihood of increased cash flow management behavior. Education and age were also positively associated with increased cash flow management behavior in 2013 when compared with 2004. Minorities were less likely to have higher cash flow management behavior in 2013 compared with Whites.

In contrast to the total sample, low-income employees' cash flow management behavior did not change following the crisis when other factors were controlled for, as shown in Table 8. Similar to the model for all employees, low-income employees with higher education and who were older were 35 and 2% more likely to report higher cash flow management behavior for each incremental increase in education and age, respectively. Racial and ethnic differences were observed across all income categories.

Middle-income employees were 31% more likely to have higher cash flow management practices following the financial crisis. Middle-income employees were the only subgroup of employees more likely to have higher savings behavior and cash flow management behavior following the financial crisis. Among high-income employees, overall cash flow management behavior was not different before or after the crisis. However, among high-income employees, Blacks and Hispanics were less likely to have high cash flow management behavior relative to White households.

Table 7 Saving behavior change between 2004 and 2013

	Total sample[a]		High-income[b]		Middle-income[c]		Low-income[d]	
	N = 7,246		n = 3,839		n = 1,791		n = 1,616	
	b	OR	b	OR	b	OR	b	OR
Post-crisis (after crisis = 1)	0.42***	1.53	0.31***	1.36	0.52***	1.69	0.44***	1.55
Income level (low = 1, high = 3)	0.82***	2.26	—	—	—	—	—	—
Race (White = Ref.)	—	—	—	—	—	—	—	—
Black	−.16*	0.85	−0.36**	0.70	−0.11	0.89	−0.10	0.91
Hispanic	−.66***	0.52	−0.30	0.74	−0.51**	0.60	−.80***	0.45
Other race	−.15	0.86	0.00	1.00	−0.08	0.92	−0.56	0.57
Education	.22***	1.24	0.17***	1.18	0.23***	1.26	.36***	1.44
Age	−.01	0.99	−0.01***	0.99	0.00	1.00	0.01	1.01
Intercept 1	1.13***	0.32	−4.86***	0.01	−2.84***	0.06	−1.40***	0.25
Intercept 2	0.71***	2.03	−2.42***	0.09	−1.07***	0.34	0.43**	1.54
Intercept 3	2.37***	10.72	−0.58***	0.56	0.53**	1.71	2.05***	7.77

Note: b = coefficient of variables; OR = odds ratio.

[a]For total sample model, $\chi^2 = 1526.30$***; Pseudo $R^2 = 0.09$.

[b]For high-income model, $\chi^2 = 93.15$***; Pseudo $R^2 = 0.01$.

[c]For middle-income model, $\chi^2 = 91.02$***; Pseudo $R^2 = 0.02$.

[d]For low-income model, $\chi^2 = 166.82$***; Pseudo $R^2 = 0.04$.

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

Table 8 Cash flow management behavior change between 2004 and 2013

	Total sample[a]		High-income[b]		Middle-income[c]		Low-income[d]	
	N = 7,246		n = 3,839		n = 1,791		n = 1,616	
	b	OR	*b*	OR	*b*	OR	*b*	OR
Post-crisis (after crisis = 1)	0.14**	1.15	0.00	1.00	0.27**	1.31	0.14	1.55
Income level (low = 1, high = 3)	0.72***	2.05	—	—	—	—	—	—
Race (White = Ref.)	—	—	—	—	—	—	—	—
Black	−0.82***	0.44	−0.56***	0.57	−0.89***	0.41	−0.87***	0.42
Hispanic	−0.54***	0.58	−0.49*	0.62	−0.58***	0.56	−0.48***	0.62
Other Race	−0.23*	0.79	−0.22	0.81	−0.36*	0.70	−0.13	0.88
Education	0.16***	1.17	0.08**	1.08	0.22***	1.25	0.30***	1.35
Age	0.01***	1.01	−0.01*	0.99	0.01***	1.01	0.02***	1.02
Intercept 1	−2.59***	0.08	−7.26***	0.00	−4.06***	0.02	−2.72***	0.07
Intercept 2	−0.30**	0.74	−3.66***	0.03	−1.59**	0.20	−0.58**	0.56
Intercept 3	1.66***	1.66	−1.31***	0.27	0.28	1.32	1.35***	3.85

Note: b = coefficient of variables; OR = odds ratio.

[a]For total sample model, χ^2 = 1225.48***; Pseudo R^2 =. 009.

[b]For high-income model, χ^2 = 30.96***; Pseudo R^2 = 0.01.

[c]For middle-income model, χ^2 = 109.66***; Pseudo R^2 = 0.03.

[d]For low-income model, χ^2 = 136.50***; Pseudo R^2 = 0.04.

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

6. Discussion and implications

This study found that the overall savings behavior of all employees improved following the 2007–2009 financial crisis relative to pre-financial crisis practices and persisted for several years following the crisis. Even among low-income working households, savings practices are flexible and can be altered. While the financial crisis was an extreme external event, the findings of this study suggest that low-income employees' savings behaviors are malleable despite limited income. The savings behavior findings of all employees in this study were consistent with results from previous studies that also examined the effects of a financial crisis on savings behaviors of the general population (Fidelity Investments, 2013; O'Neill & Xiao, 2012). In particular, O'Neill and Xiao's (2012) study utilized a similar methodology of this study to examine pre- and post-financial behaviors. Similar to this study, O'Neill and Xiao (2012) found that the participants' savings behavior was better after the 2007–2009 financial crisis. Likewise, the Fidelity (2013) study saw an increase in participants' emergency funds and retirement savings after the 2007–2009 financial crisis as opposed to before the crisis.

Moreover, the cash flow management behaviors of employees, in general, improved after the 2007–2009 financial crisis. However, when the sample was segmented by income, only middle-income employees' cash flow management behavior, as a group, was more likely to improve following the financial crisis, while the cash flow management behaviors of low-income and high-income employees were unchanged after the financial crisis. Similarly, in the O'Neill and Xiao (2012) study, participants' budgeting and spending behaviors, which is typically considered cash flow management behaviors, improved after the 2007–2009 financial crisis. Moreover, in the Fidelity (2013) study, participants decreased their debt after the 2007–2009 crisis, which would increase participants' cash flow.

This study has very practical implications for employers and financial planners who advise on retirement plans and who are looking for ways to increase employee participation and contribution rates in their retirement plans. All employees, regardless of income level, can adjust their savings behavior. Employers and retirement plan advisers, who conduct new-hire enrollment seminars or ongoing outreach to plan participants, should focus on motivating increased savings since savings behavior appears to be flexible. When thinking about motivating increased savings in an employer-sponsored retirement plan, less emphasis should be placed on cash flow management behaviors such as banking relationships, debt management, and spending behaviors, since these behaviors seem less responsive to change. Savings behavior appears to be more responsive to change; therefore, employers and retirement plan sponsors should target it directly.

Strategies that incorporate processes of the Transtheoretical Model of Change will provide low-income employees greater intrinsic motivation to change their savings behavior. Financial planners may find that consciousness raising activities with a focus on fostering an emotional response (dramatic relief) from potential participants are important first steps. Given the lasting change observed in this study, one way financial advisors could trigger the desired emotional response is to appropriately rekindle emotions connected with the financial crisis. Plan sponsors and advisors should also consider providing opportunities for low-income employees to self-identify as savers (self-reevaluation) and then also provide strong

public reinforcement of positive savings decisions. These strategies coupled with easy enrollment procedures, matching contributions, and simplified investment options may be effective strategies in inducing savings behavior change among employees, particularly among low-income employees.

7. Limitations and future research

Researchers observed several limitations while conducting this study. While most questions used to measure savings and cash flow management behaviors were adopted from Hogarth et al. (2003), there could be some overlap in the participants' interpretation of these questions. An example of this overlap may exist between the two questions; "Do you save on a regular basis?" and "Do you have money automatically deposited into an account?" Furthermore, SCF has gradually added financial behaviors over the years, but the number and the variety of financial behavior questions within SCF are still limited. Additionally, limitations in how cash flow management and savings behavior were conceptualized and modeled in this study, applying variable constructs from previous studies, could have affected observed relationships in the models.

Future research will again focus on employees' financial behavior; however, the behavior categories would expand to investment behaviors as well as retirement and retirement planning behaviors. Also, segmenting the overall employee sample by classes such as blue collar workers and white collar workers and then examining their financial behaviors might produce interesting results. Finally, instead of examining unintended factors, future research would examine the effects of intended factors such as financial education, automatic deposit into an account and automatic 401k enrollment on behavior.

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