

Educating the Experts: Online Financial Education for Credit Union Employees

Studies evaluating financial education are often plagued by methodological problems, especially selection bias. This analysis tracks the self-reported financial knowledge and behavior of employees who had the opportunity to take a 10-hour online financial education course at 21 randomly assigned credit unions. Staff at 24 credit unions randomly assigned to the control group received the same offer 6 months later. The offer of online financial education is related to statistically significant—but small—improvements in self-reported financial knowledge and behavior. These results suggest online education may be a useful mechanism for delivering financial content, but also suggest caution regarding the potential of education as a behavioral remedy.

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Introduction

Although it is widely accepted that many Americans lack financial literacy, it remains largely unclear what types of interventions succeed in bolstering individuals' financial capacity. Financial education initiatives continue to proliferate, but methodologically robust program evaluations remain quiterare. Thus far much of the evaluation literature in this area tends to rely on fairly unconvincing research designs(Collins & O'Rourke, 2010). This study seeks to shed greater light on the promise of financial education by evaluating anonline financial education program for credit union employees. This study utilizes a randomized design, measures the intention-to-treat, and analyzes a longitudinal dataset, all of which are methodological strengths relative to many past studies in this field.The effectiveness of online interventions is of particular interest because web-based programs could help financial educators reduce costs and reach more people.

Literature Review

The well-publicized spike in consumer debt and problems in the housing and financial markets have renewed interest into whether individuals can benefit from financial education. Furthermore, increasing evidence indicates that many Americans do not understand basic personal finance concepts. For instance, Lusardi and Mitchell (2007) found that only 18 percent of individuals ages 51 to 56 could correctly answer a question requiring a simple compound interest calculation. More recently, an analysis of the 2009 National Financial Capability Study indicates only 52 percent of American adults know that owning a mutual fund generally offers a safer return than investing in a single company's stock (Applied Research & Consulting LLC, 2009). Other studies indicate that a significant proportion of homeowners do not fully understand the terms of their mortgages (Bucks & Pence, 2008; Campbell, 2006). Many additional studies have documented similarly alarming findings, and the studies cited here are representative of a broader literature.

Importantly, a lack of financial literacy appears to manifest itself in the form of detrimental financial behavior. Several studies document a positive correlation between financial literacy and beneficial financial behaviors including planning for retirement and saving (for example, see Hilgert, Hogarth, & Beverly, 2003; Lusardi & Mitchell, 2007; Mandell & Klein, 2009). This research is not yet conclusive because establishing causality between financial literacy and behavior through existing datasets is difficult. Individuals may gain financial literacy after certain experiences, in which case financial literacy does not cause behavior but instead stems from it. However, a growing body of literature indicates that financial literacy does indeed influence behaviors, such as planning and investing, which in turn have significant ramifications for consumers' long-term financial security (Lusardi & Mitchell, 2007). Meanwhile, financial products are becoming more sophisticated and individuals are increasingly charged with making complex financial decisions (e.g. defined benefit pensions are becoming less common relative to defined contribution plans). Thus, the lack of financial literacy raises serious concerns about consumers' capacity to manage their finances in an ever-changing marketplace.

Recognizing the gaps in consumers' financial knowledge and behavior, numerous organizations across the US are involved in delivering financial education. Moreover, many federal and state policies explicitly promote, or even require, financial education, again based on the assumptions that it will lead to knowledge gains, improvements in behavior, and ultimately financial security. Despite the proliferation of financial education programs, little compelling evidence suggests these programs significantly improve participants' financial literacy or behavior over time. Thus, although the link between financial literacy and positive financial outcomes is generally uncontested, evidence that specific programs succeed in bolstering financial literacy remains elusive. This study assesses an online financial education program offered to credit union employees. This analysis was designed in such a way that it overcomes the methodological weaknesses we have observed across past studies.

Empirical literature on financial education and counseling is continually emerging, yet many program evaluations suffer from methodological limitations. Collins and O'Rourke (2010) conducted a literature review of financial education and counseling evaluations; the authors provide an overview of the common methodological weaknesses across studies. The most problematic issue is selection bias, which stems from the fact that individuals who participate in financial education almost certainly differ from nonparticipants in ways that affect outcome measures. The majority of studies on financial education either lack a comparison group altogether or utilize non-random comparison groups (Collins & O'Rourke, 2010). As such, selection processes make it difficult to establish causality between participation in financial education and subsequent changes in financial knowledge or behavior.

Evaluations must account for the fact that attending a financial education program could merely be a signal of traits (e.g. high motivation, future orientation, or self-efficacy) that are themselves responsible for changes in financial knowledge or behavior. The most important study in this regard was conducted by Meier and Sprenger (2008), who offered free information to low- and moderate-income tax preparation clients about their credit reports and scores and surveyed participants about their time preferences. More patient individuals were more likely to participate in the short financial education program. Because time preferences likely affect financial behavior and knowledge attainment, this study provides strong evidence that differences in outcome measures between individuals who participate in voluntary financial education and nonparticipants are attributable, at least in part, to unobserved differences between the two groups. Similarly, many financial education evaluations analyze a sample that is only comprised of individuals who have completed a specific program, which further heightens concerns about selection bias. In order to minimize the likely biases arising from selection processes, this study utilizes a randomized design and measures the effects of the intention-to-treat rather than the treatment-on-the-treated.

Even when financial education programs appear effective (e.g. participants' savings levels increase), little evidence exists suggesting that short-term improvements in financial literacy manifest themselves as long-term effects on behavior and financial security (for example, Mandell & Klein, 2009). Collins and O'Rourke (2010) also found that the vast majority of evaluations collect data at just one or two points in time, so the persistence (versus atrophy) of changes in participants' financial knowledge and behavior remains unclear. It could be the case that changes in financial knowledge and behavior erode with time, or that participants manage to build on their newfound knowledge and skills over time. Recognizing that better evidence is needed on the persistence of outcome measures following financial education, this study collects longitudinal data at three points in time.

Financial education programs are available in numerous contexts, but for the purposes of this paper evaluations of workplace-based interventions comprise the most relevant literature. Workers are increasingly responsible for planning and saving for their retirement, and workplace-based financial education has become an important channel for providing financial information to employees (Bernheim & Garrett, 2003). The present study differs from most other workplace-based evaluations because this analysis is concerned with measures of financial knowledge and behavior that extend beyond planning and saving for retirement. Furthermore, the individuals involved in this study are all employed by credit unions, so their average baseline financial capacity is expected to differ from the participants in other studies. Nonetheless, previous evaluations of workplace-based programs remain the most comparable segment of the literature for the present study.

Several studies examine the effects of financial education provided in the workplace. Again, these studies tend to focus on retirement savings and planning, but they also offer insight into whether employees will participate in workplace-based programs and whether these programs are effective. The most compelling study in this area was published by Bayer, Bernheim, and Scholz (2009). The authors find that offering frequent retirement seminars to employees is associated with higher participation in and

contributions to voluntary savings plans, especially among nonhighly compensated employees. The participation rate of nonhighly compensated employees was 11.5 percentage points higher at firms that offered frequent seminars relative to firms that did not. In a related study, Bernheim and Garrett (2003) also conclude that the offer of financial education in the workplace increases employees' contributions to retirement plans. We have identified other studies that examine workplace-based financial education, all of which associate employment-based interventions with improvements in employees' financial knowledge or behavior (Garman et al., 1999; Clark & D'Ambrosio, 2003; Kim, 2007; Kim, Bagwell, & Garman 1998; Holland, Goodman, & Stich, 2008). However, these studies tend to suffer from many of the methodological weaknesses discussed above.

Despite the proliferation of websites devoted to personal financial matters and the promise of technology for transforming the delivery of financial education, the literature examining online financial education is negligible. Online financial education is an important area of inquiry for several reasons, three of which will be briefly outlined here. First, and perhaps most obviously, online courses can theoretically be delivered to a much larger audience and at a lower cost per participant than more resource intensive delivery channels. Second, online courses can potentially reach people who would not otherwise attend financial education, which is important given the earlier discussion surrounding selection effects. Online courses may prove more convenient to participants and may therefore attract people who would not be interested in, or perhaps even able to attend, workshops or classes. Finally, online financial education potentially gives people the freedom and privacy to explore financial issues that they would shy away from in other settings. Before these broader questions can be explored, however, we are interested in gaining a sense of a more basic issue; that is, whether online financial education is effective in the first place. In the field of credit counseling, at least one study concludes that technology-assisted delivery mechanisms, including web-based programs, yield outcomes no worse (and at some margins better) than face-to-face delivery (Barron & Staten, 2011). Nonetheless, the efficacy of web-based interventions, especially in the area of financial education, merits far greater attention.

Description of the Intervention

In the fall of 2009, the Wisconsin Credit Union League sponsored the REAL Progress & Pathways to Prosperity (RP3) program. The goal of the RP3 program was to recruit credit unions in Wisconsin to enroll their employees in an online financial education program. The ten-module RP3 program took an average of 10 hours to complete and covered the following topics: 1) Getting Started on Investing; 2) Basics of Personal Finance; 3) Basics of Investing; 4) Basics of Investment Strategies; 5) Investment Risks; 6) Basics of Retirement Planning; 7) Investing in Mutual Funds; 8) Working with Financial Advisors; 9) Saving for College; and 10) Supplementary Information.

Forty-five credit unions agreed to participate in a randomized evaluation of the RP3 program. Participating credit unions were randomly assigned to offer the online course to their employees either in the fall of 2009 or in the spring of 2010. Employees at the credit unions that offered the RP3 program in the fall constitute the 'treatment' group. In turn, employees at the credit unions that offered the program in the spring constitute the 'control' group based on the assumption that individual financial behaviors are not correlated with a credit union's assignment into the fall or spring cohort. This design allowed for the estimation of causal effects without withholding services. Admittedly, from a statistical standpoint, randomly assigning individuals (rather than credit unions) to the treatment or control group would be a more desirable strategy. However, in order to avoid contamination while allowing credit unions to promote the RP3 program effectively, randomization occurred at the level of the credit unions. Employees in both groups completed a 48-question survey concerning their self-assessed financial knowledge and self-reported behavior in October 2009, January 2010, and April 2010. These three surveys constitute Waves 1, 2, and 3 of the survey data, respectively. All participants completed the same surveys at the same point in time, regardless of whether their employer offered the RP3 online education program in the fall or spring. Based on the literature review and the intent of the RP3 program, three hypotheses were developed:

H1: The offer of online self-paced financial education has a positive causal effect on self-assessed financial knowledge.

H2: The offer of online self-paced financial education has a positive causal effect on self-reported financial planning and management behaviors.

H3: The offer of online self-paced financial education has a positive causal effect on self-reported savings behaviors.

Data and Methods

The data were provided by the online financial education company Precision Information, LLC from web-based surveys. The survey data were combined with administrative data on each employee's credit union (e.g. credit unions' assets and membership levels) using a student code with no personally identifiable information. Duplicate and unmatched records were dropped. Although 508 individuals in the treatment group completed the Wave 1 survey in October 2009, the final treatment group was comprised of 323 employees due to non-response on the follow-up surveys. Within the control group, 873 employees completed the Wave 1 survey in October 2009, and 729 employees remained in the final dataset. Therefore, the final number of observations was 1,052.

Table 1 displays the descriptive statistics from the Wave 1 (October 2009) survey for all participants. Age is scaled from 1 to 5 using 10-year increments, where 1 is 18-35 years and 5 is 65+ years. The mean age is 2.2, which corresponds to the 35-44 age range. Most respondents were married (72 percent), 19 percent had children under the age of 6, 33 percent had children ages 6-18, and 38 percent had adult children (age 18 or older). The marital status and parenthood variables are particularly important because these two characteristics likely exert strong influences on financial behavior. Only 17 percent of respondents were male, which reflects the high proportion of females employed by credit unions. The U.S. Department of Labor reports that 75 percent of individuals employed at savings institutions, including credit unions, are female (U.S. Department of Labor Bureau of Labor Statistics, 2009). Income is scaled in \$1,000 increments from 1 to 8, where 1 is below \$1,000 per month and 8 is more than \$7,000 per month. The mean response of 5 indicates that respondents earn about \$4,000 each month, on average, or \$48,000 annually. By comparison, the median income in the State of Wisconsin was \$52,103 in 2008 (U.S. Census Bureau, 2009). Education was coded dichotomously as some college versus no college, with 54 percent of respondents reporting they had attended at least some college. Employment duration is scaled from 1 to 7 using five-year increments, where 1 is less than 5 years and 7 is more than 35 years. The mean of 2.2 indicates that the average employee had five to 10 years of employment experience.

The InCharge Financial Distress/Financial Well-Being Scale (PFW), which was developed by Prawitz et al. (2006), was also included in the web-surveys. The scale ranges from 0 to 10 and provides an estimate of individuals' financial stress and wellness. The scale's reliability ($\alpha=0.94$) was high and was close to the reliability documented in previous studies. The mean value on this scale for all respondents at Wave 1 was 6.2, which corresponds with moderate financial distress and moderate financial well-being (Prawitz et al., 2006).

Table 1
Descriptive Statistics of Wave 1 Participants

	Mean	Standard Deviation	Min	Max
Age (1=18-35, 5=65+)	2.152	1.123	1	5
Married (1=Married)	0.718	0.450	0	1
Kids under 6 yrs old (1=Have kids)	0.186	0.390	0	1
Kids 6-18 yrs old (1=Have kids)	0.329	0.470	0	1
Kids 18+ years old (1=Have kid)	0.379	0.485	0	1
Gender (1=Male)	0.174	0.379	0	1
Income (1=Less than \$1000/mo, 8=\$7000+/mo)	5.042	2.025	1	8
Education (1=Some college)	0.542	0.498	0	1
Employment duration (1=0-5 yrs, 7=35+ yrs)	2.213	1.598	1	7
Personal Financial Wellness Scale*	6.173	2.085	1	10
Log credit union members	9.920	1.306	3.367	11.810
Log credit union assets	18.967	1.454	8.888	21.032
Interest and loan knowledge (1=Low, 5=High)	3.888	0.951	1	5
Credit score knowledge (1=Low, 5=High)	3.696	1.060	1	5
Stocks and bonds knowledge (1=Low, 5=High)	2.486	0.921	1	5

	Mean	Standard Deviation	Min	Max
Investing for retirement knowledge (1=Low, 5=High)	2.868	0.914	1	5
Knowledge from online (1=Low, 5=High)	2.868	1.316	1	5
Individual Retirement Account (1=Participates)	0.510	0.500	0	1
Written budget (1=Has written budget)	0.410	0.492	0	1
Written financial plan (1=Has written financial plan)	0.185	0.389	0	1
Save for long-term goals (1=Agrees with statement)	0.686	0.464	0	1
Have 3 months expenses set aside (1=Agrees with statement)	0.477	0.500	0	1

N=1052

*Cronbach's alpha=0.9410

In addition to the web-survey measures related to individual characteristics, the log of each credit union's assets and the log of each credit union's membership level were included to control for their size and scale. Credit unions had an average of nearly \$173 million in assets (18.97 as a natural log) and about 20,000 members (9.92 as a natural log).

The ten dependent variables are listed at the bottom of Table 1, beginning with five questions related to financial knowledge followed by five questions on self-reported behavior. Observations with missing responses to the survey questions used as dependent variables were dropped. The self-assessed knowledge ratings range from 1 to 5, where 5 is a "high" level of knowledge and 1 is "low" knowledge. As might be expected for credit union employees, respondents' self-assessed knowledge of interest and loans as well as credit scores was higher than their self-assessed knowledge of stocks and bonds and investing for retirement. An additional measure that asked employees to recall where they learned about financial issues is included to gauge their exposure to online education and therefore the RP3 program.

The final five variables listed in Table 1 are dichotomous variables concerning participants' financial behaviors. These self-reported measures are coded 0 or 1, where 0 indicates the respondent did not engage in the behavior at the time of the survey and 1 indicates the employee did engage in the behavior. 'Not sure' responses to the behavior questions were recoded as 0. Fewer than 2 percent of respondents reported they were "not sure" on any particular behavior question. At Wave 1 about one-half of respondents across both groups (51 percent) reported having an individual retirement account, 41 percent reported maintaining a written budget, 19 percent reported having a written financial plan, 69 percent reported saving for long-term goals, and 48 percent reported having emergency funds set aside to cover three months of expenses.

Table 2 displays the differences at baseline between the treatment and control groups. The two groups are different along a number of dimensions, which we attribute to the fact that randomization occurred at the level of the credit union. Respondents in the treatment group tend to be older, are less likely to be married, are more likely to have children ages 6-18 and adult children, tend to have lower incomes, are less likely to have attended college, and are more likely to work for smaller credit unions (in terms of assets and membership levels). These differences are generally not large in magnitude, but they are all statistically significant. Therefore, the statistical models need to be carefully specified, and as such the experimental estimations outlined in Equations 1 and 2 below control for the baseline (Wave 1) differences observed in Table 2.

Table 2
Comparison of Means for Treatment vs. Control Independent Variables at Baseline

	Control	Treatment	Significance
Age	2.112 (1.112)	2.241 (1.144)	+
Married (1=Married)	0.734 (0.442)	0.681 (0.467)	+
Kids under 6 yrs old	0.188 (0.391)	0.183 (0.387)	
Kids 6-18 yrs old	0.307 (0.462)	0.378 (0.486)	*
Kids 18+ yrs old	0.359 (0.480)	0.424 (0.495)	*

	Control	Treatment	Significance
Gender (1=Male)	0.177 (0.382)	0.167 (0.374)	
Income	5.160 (2.001)	4.775 (2.056)	**
Education (1=Some college)	0.582 (0.494)	0.452 (0.498)	**
Employment Duration	2.198 (1.571)	2.248 (1.659)	
Personal Financial Wellness Scale	6.229 (2.032)	6.046 (2.198)	
Log credit union members	10.255 (1.320)	9.164 (0.894)	**
Log credit union assets	19.350 (1.458)	18.103 (1.006)	**
Credit Union Participation (in %)	87.635 (15.597)	88.333 (10.507)	

Mean; Standard Deviation in Parenthesis; Significance (Difference≠0); N=1052

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Two models are analyzed, both of which use the October 2009 (Wave 1) survey as the baseline and the January 2010 (Wave 2) survey as the follow-up. The first model estimates the effects of the RP3 offer on self-assessed financial knowledge. Again, the self-assessed financial knowledge dependent variables are each measured on five-point scales. These variables are transformed into differences between their baseline and follow-up values. The term Δy is defined as each dependent variable, y , at time $t=1$ subtracted from that same variable, y , at time $t=2$. The effects of the offer of the online education program on self-assessed knowledge are estimated using Ordinary Least Squares (OLS) regressions for person i at credit union j with robust standard errors where,

$$\Delta y = \alpha + \beta_{1,i,t}(treatment) + \beta_{2,i,t}(age) + \beta_{3,i,t}(married) + \beta_{4,i,t}(children < 6) + \beta_{5,i,t}(children 6-18) + \beta_{6,i,t}(children 18 or older) + \beta_{7,i,t}(male) + \beta_{8,i,t}(income) + \beta_{9,i,t}(some college) + \beta_{9_{10,i,t}}(PFW scale) + \beta_{11_j}(\ln CU members) + \beta_{12_j}(\ln CU \$ assets) + \varepsilon (1)$$

The treatment, β_1 , is coded treatment=1 when the respondent worked at a credit union that offered the RP3 online education program in the fall of 2009 and 0 if the credit union offered the program in the spring of 2010.

The second model is used to measure the effects of the RP3 offer on self-reported behavior. The dependent variables that measure self-reported behavior are dichotomous and are therefore estimated using a probit binary response model. Rather than calculating Δy , this model uses a different approach in which the dependent variable is y at time $t=2$ and a control is y at time $t=1$. Otherwise, this specification is similar to Eq. 1, including the use of robust standard errors, where,

$$y_{t2} = \alpha + \beta_{1,i,t}(treatment) + \beta_{2,i,t}(age) + \beta_{3,i,t}(married) + \beta_{4,i,t}(children < 6) + \beta_{5,i,t}(children 6-18) + \beta_{6,i,t}(children 18 or older) + \beta_{7,i,t}(male) + \beta_{8,i,t}(income) + \beta_{9,i,t}(some college) + \beta_{9_{10,i,t}}(PFW scale) + \beta_{11_j}(\ln CU members) + \beta_{12_j}(\ln CU \$ assets) + \beta_{13_j}(y_{t1}) + \varepsilon (2)$$

Results

Table 3 displays the OLS results for the self-assessed knowledge measures. Estimates are point increases on five-point scales, again where 1=low and 5=high self-reported knowledge. The treatment effect is statistically significant across all five models and is significant at the 99 percent level in four of the five models. Respondents' self-assessed knowledge of interest and loans increased by almost 0.15, compared to a baseline of 3.9, which is an increase of 4 percent or less than one-fifth of a standard deviation over the baseline mean. The 0.10 increase in self-assessed knowledge of credit scores was statistically significant at the 90 percent level. This estimate represents a 3 percent increase over the baseline mean of 3.7, an increase of one-tenth of a standard deviation. Self-assessed knowledge of stocks

and bonds increased by 0.52 over the baseline mean of 2.5. This gain represents a 21 percent increase over the baseline mean, or an increase of just over one-half of a standard deviation. Self-assessed knowledge of saving for retirement increased by 0.31 over the baseline mean of 2.9, which is an 11 percent increase or one-third of a standard deviation.

As a check of the source of respondents' knowledge gains, respondents were asked to identify where they learned about financial topics. The treatment was associated with an increase in learning about financial information online of 0.72 points, which is a 25 percent marginal increase and an increase of over one-half of a standard deviation. This finding indicates that the credit union employees in the treatment group attributed their knowledge gains to the online RP3 course.

Table 3
OLS Regression Results of Knowledge Questions with Treatment

	Δ interest and loan knowledge	Δ credit score knowledge	Δ stocks and bonds knowledge	Δ investing for retirement knowledge	Δ knowledge from online
Treatment	0.1486** (0.0540)	0.1041 ⁺ (0.0540)	0.5215** (0.0551)	0.3133** (0.0553)	0.7216** (0.1104)
Age	-0.0419 (0.0392)	-0.0266 (0.0372)	-0.0371 (0.0386)	-0.0298 (0.0480)	-0.0696 (0.0664)
Married	-0.0149 (0.0642)	-0.0594 (0.0597)	0.0027 (0.0652)	-0.0612 (0.0644)	-0.0011 (0.1233)
Kids under 6 yrs old	-0.0282 (0.0655)	-0.0052 (0.0632)	0.0588 (0.0703)	0.0409 (0.0676)	-0.0215 (0.1319)
Kids 6-18 yrs old	0.0283 (0.0489)	0.0733 (0.0488)	0.0710 (0.0508)	0.0554 (0.0525)	-0.0046 (0.1014)
Kids 18+ yrs old	0.0683 (0.0823)	0.0915 (0.0790)	0.0810 (0.0794)	0.1808* (0.0861)	-0.0037 (0.1344)
Gender (1=Male)	0.0411 (0.0552)	0.1926** (0.0596)	-0.1193* (0.0590)	-0.0656 (0.0611)	0.0033 (0.1332)
Income	0.0193 (0.0146)	0.0039 (0.151)	0.0016 (0.0148)	0.0098 (0.0151)	0.0378 (0.0301)
Education (1=Some college)	-0.0151 (0.0496)	-0.0286 (0.0501)	0.1029* (0.0515)	-0.0001 (0.0522)	-0.0649 (0.0992)
Employment Duration	-0.0175 (0.0161)	-0.0348* (0.0167)	-0.0029 (0.0169)	-0.0165 (0.0168)	0.0550 ⁺ (0.0325)
PFW	-0.0133 (0.0142)	-0.0067 (0.0139)	-0.0070 (0.0143)	-0.0245 ⁺ (0.0145)	-0.0091 (0.0251)
Log members of credit union	0.1192 (0.0756)	0.0946 (0.0801)	0.0423 (0.0789)	-0.0661 (0.0780)	0.1326 (0.1624)
Log assets of credit union	-0.1013 (0.0659)	-0.1111 (0.0709)	-0.0410 (0.0701)	0.0442 (0.0684)	-0.1117 (0.1449)
Constant	0.7840 (0.5574)	1.2852* (0.6102)	0.3066 (0.6121)	0.0029 (0.6033)	0.7973 (1.2824)
Observations	1052	1052	1052	1052	1052
R^2	0.019	0.033	0.110	0.061	0.054

Robust standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Respondents' characteristics at baseline are not especially predictive of changes in their self-assessed financial knowledge. Few of the variables included as controls are statistically significant in Table 3. However, men appear to experience smaller gains in their knowledge of stocks and bonds but greater improvements in their knowledge of credit scores than women. Having children over the age of 18 is related to greater increases in self-assessed knowledge of investing for retirement, and attending at least some college is associated with greater improvements in self-assessed knowledge of stocks and bonds. The duration of one's employment is associated with a slightly smaller increase in knowledge of credit scores.

No other covariates are statistically significant at the 95 percent confidence level. These effects are not part of the hypotheses tested and are generally small in magnitude, but they are statistically significant.

Table 4 displays the results concerning respondents' self-reported financial behavior. All of the results are reported as marginal effects over baseline. Respondents' self-reported use of Individual Retirement Accounts (IRAs) increased by 7.7 percent, and their self-reported use of written budgets increased by 6.1 percent. The self-reported use of a written financial plan increased by 5.2 percent. However, the results concerning saving for long-term goals were not statistically significant, although the coefficient was positive. There is weak evidence ($p < .10$) that the offer of online education led to an increase in the number of employees that had set aside savings equal to three months' worth of their expenses. Together, these results support the intended effects of the program.

Table 4
Probit Results of Financial Behavior Questions with Treatment

	IRA	Written budget	Written financial plan	Save for long-term goals	3 months expenses aside
Treatment	0.0765** (0.0230)	0.0612* (0.0268)	0.0523* (0.0258)	0.0273 (0.0263)	0.0458+ (0.0258)
Age	0.00521 (0.0141)	0.0132 (0.0163)	0.0253 (0.0157)	0.0266 (0.0166)	0.0354* (0.0156)
Married	0.0715** (0.0249)	0.0214 (0.0321)	0.0405 (0.0330)	-0.00161 (0.0303)	-0.0492+ (0.0294)
Kids under 6 yrs old	-0.0198 (0.0267)	0.0374 (0.0328)	-0.0172 (0.0331)	0.0335 (0.0326)	-0.0335 (0.0325)
Kids 6-18 yrs old	-0.0380+ (0.0216)	0.000699 (0.0254)	0.0154 (0.0247)	-0.0210 (0.0250)	-0.0552* (0.0241)
Kids 18+ yrs old	0.00316 (0.0300)	-0.0218 (0.0358)	0.0100 (0.0330)	0.00697 (0.0339)	0.00331 (0.0328)
Gender (1=Male)	0.00288 (0.0260)	-0.0129 (0.0324)	-0.0153 (0.0305)	-0.0179 (0.0317)	-0.00344 (0.0302)
Income	-0.00279 (0.00584)	0.0185* (0.00747)	0.00396 (0.00714)	0.0180* (0.00728)	0.00902 (0.00663)
Education (1=Some college)	0.00334 (0.0207)	-0.0257 (0.0255)	0.0217 (0.0240)	0.0882** (0.0243)	-0.0120 (0.0230)
Employment Duration	0.00397 (0.00719)	-0.0245** (0.00797)	-0.0147+ (0.00779)	0.00222 (0.00836)	0.000418 (0.00834)
PFW	0.0142** (0.00522)	-0.00890 (0.00590)	0.0149* (0.00605)	0.0390** (0.00627)	0.0379** (0.00657)
Log members of credit union	-0.0374 (0.0379)	0.0370 (0.0411)	0.0355 (0.0431)	0.0805+ (0.0386)	0.0657+ (0.0374)
Log assets of credit union	0.0389 (0.0346)	-0.0236 (0.0370)	-0.0186 (0.0390)	-0.0756* (0.0344)	-0.0486 (0.0343)
Previous Answer	0.431** (0.0102)	0.466** (0.00602)	0.285** (0.0207)	0.302** (0.0185)	0.370** (0.0153)
Observations	1052	1052	1052	1052	1052
Pseudo R^2	0.524	0.355	0.187	0.335	0.440
ll	-346.5	-460.7	-432.0	-439.5	-408.4

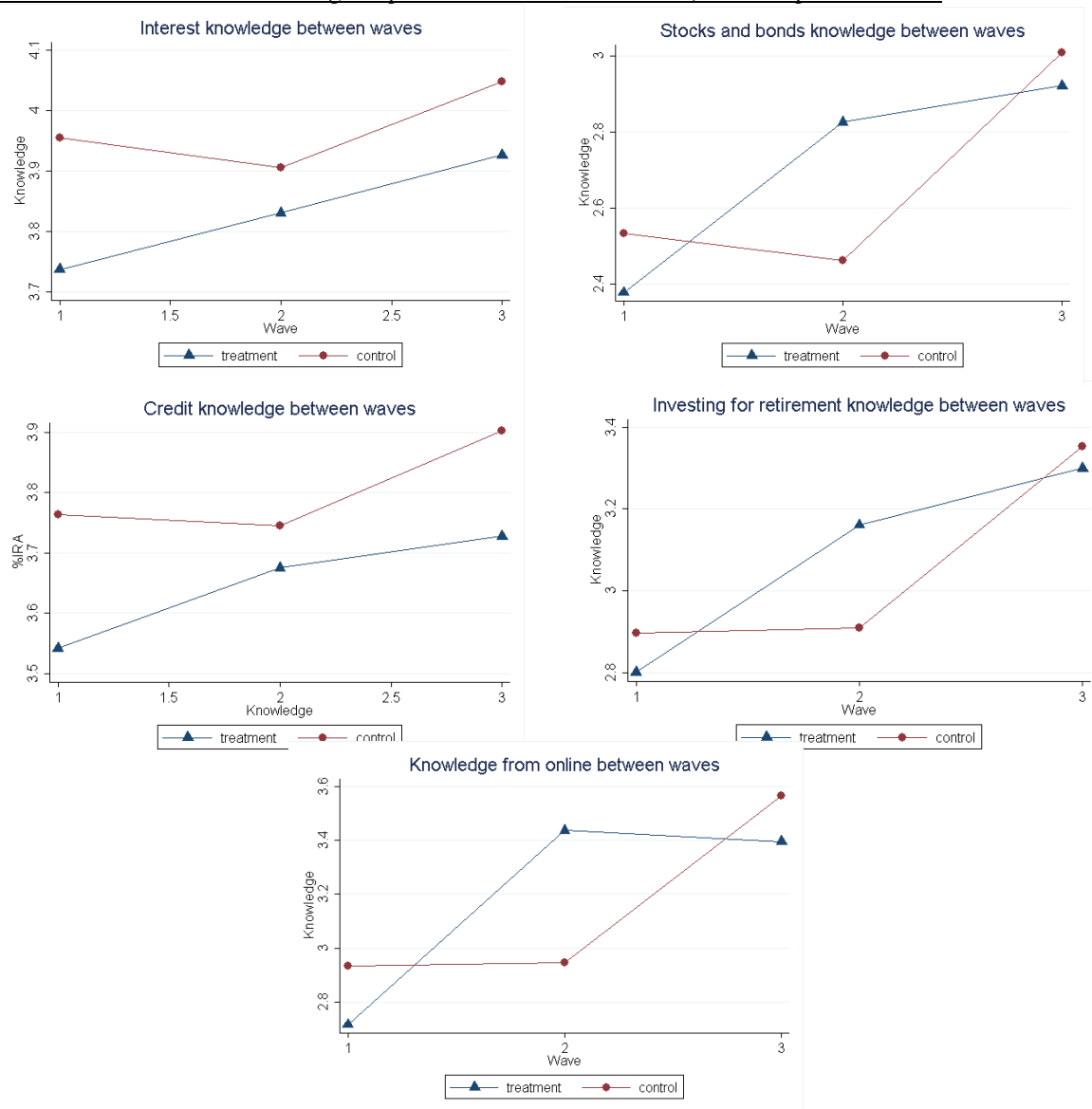
Margin coefficients, Robust standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Some of the variables included as controls in Table 4 are statistically significant. Marriage and higher personal financial wellness scores are both related to greater improvements in the use of IRAs. Income and employment duration are related to variations in the likelihood of having a written budget. Having a higher income, having attended at least some college, having greater personal financial wellness, and working for a larger credit union are all positively related to changes in saving for long-term goals. Age, having school-age children, and reporting greater personal financial wellness are associated with changes in having a reserve fund of three months' worth of expenses.

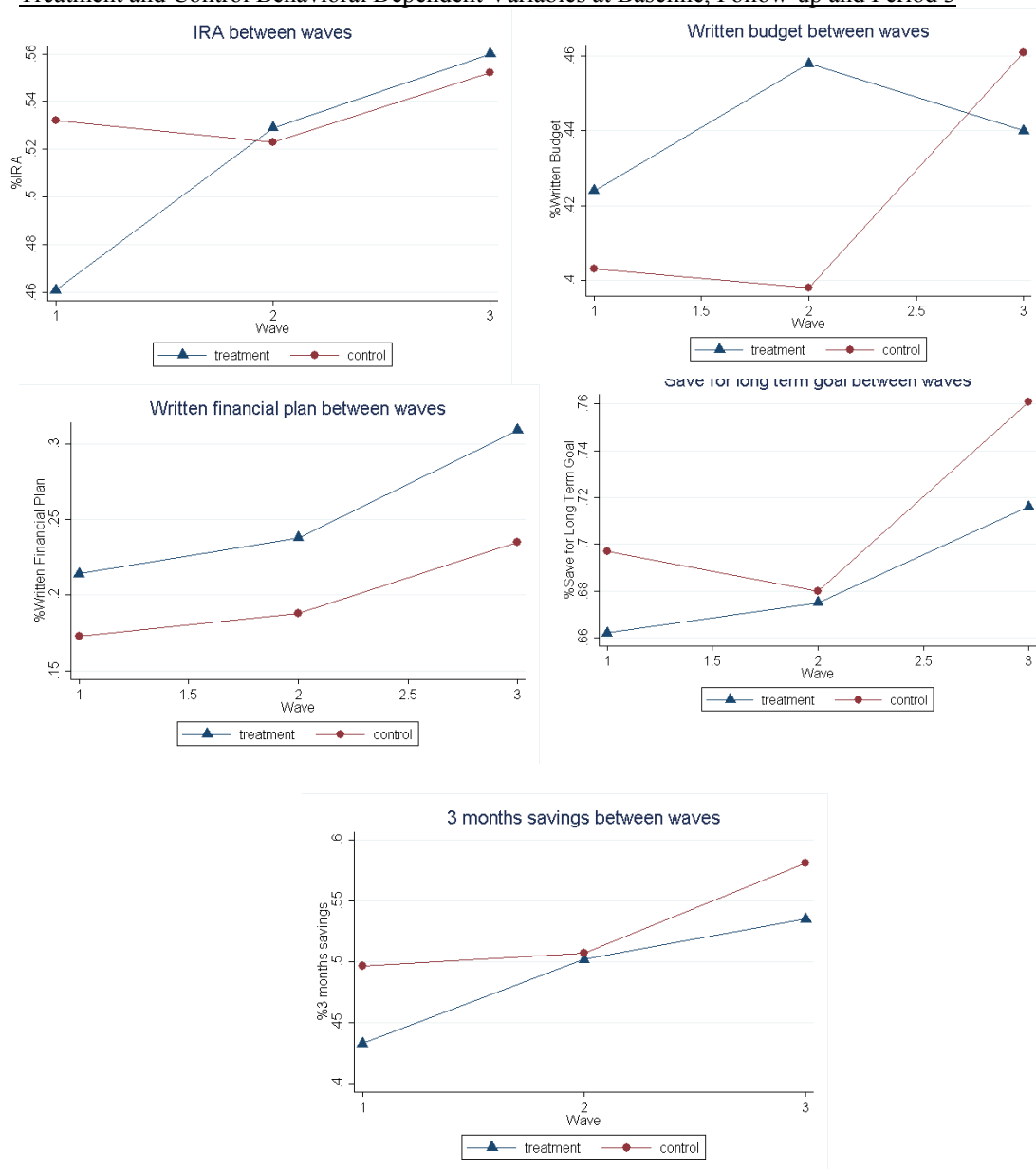
Again, another goal of this analysis is to measure persistence versus atrophy across the outcome measures, which is made possible by the third wave of data collection in April 2010. Figure 1 displays graphs of the treatment and control groups' self-assessed knowledge across all three waves of data. As shown by the positive slopes between Wave 1 and Wave 2 in Figure 1, the treatment group experienced increases in their knowledge of interest and loans, credit scores, stocks and bonds, and investing for retirement following the online course. These results correspond to the results presented in the preceding paragraphs. Meanwhile, the control group's self-reported knowledge remained flat between Waves 1 and 2, as expected. In addition, as evidenced by the positive slopes between Wave 2 and Wave 3 for the treatment group across all four knowledge measures, the effects had persisted six months after the offer of the online course. As shown on the "Knowledge from online" graph, the treatment group reported they had learned about financial information online following the intervention, and this measure remained mostly constant at Wave 3. The slopes for the control group were positive between Wave 2 and Wave 3, indicating an increase in knowledge following the intervention, which occurred between Wave 2 and Wave 3 for the control group. Importantly, the control group did not report an increase in learning from online sources between Waves 1 and 2 (but did do so from Wave 2 to 3), which further confirms the centrality of the RP3 program to the observed effects.

Figure 1
Treatment and Control Knowledge Dependent Variables at Baseline, Follow-up and Period 3



Similar results are reflected in Figure 2, which displays changes in both groups' self-reported behavior from Wave 1 to Wave 3. From Wave 1 to Wave 2, the treatment group reported an increase in planning (specifically, maintaining a written budget and a written financial plan) and saving (specifically, contributing to an IRA and having an emergency fund of three months) following the offer of the online course. These positive effects continued beyond Wave 2 across three of the four behaviors that improved significantly between Wave 1 and Wave 2, though having a written budget dropped between Wave 2 and Wave 3. Nonetheless, the treatment group's use of written budgets at Wave 3 still exceeded its use at Wave 1. The control group's self-reported behaviors were relatively constant from Wave 1 to Wave 2 and only improved after the control group was offered the online course between Waves 2 and 3. At Wave 3, the control group reported improvements across all five behavior measures relative to Wave 2.

Figure 2
Treatment and Control Behavioral Dependent Variables at Baseline, Follow-up and Period 3



Conclusions

The results presented in the preceding section support the initial hypotheses that offering the RP3 course would lead to improvements in employees' self-assessed financial knowledge, their self-reported financial planning and management behaviors, and their self-reported savings behaviors. The treatment was associated with increases in written budgeting and having a written financial plan of 6 percent and 5 percent, respectively. Additional improvements in behavior are reflected in the increased use of IRAs (8 percent increase) and the increased likelihood of having saved enough money to cover three months of expenses (5 percent increase).

These results appear broadly consistent with previous studies, but the results documented in this analysis are somewhat smaller in magnitude. For example, Bernheim and Garrett (2003) documented a 22 percent increase in the median rate of saving when financial education is available at the workplace. Bayer, Bernheim, and Scholz(2009) found a 12 percent higher rate of participation in retirement plans by nonhighly compensated employees whose workplaces offered financial education seminars. Furthermore, Anderson, Uttley, and Kerbel(2006) find 16 percent to 70 percent increases in financial task performance after individuals completed financial education in their workplace. The present study has a reasonable sample size, uses longitudinal data, estimates the effects of the intention-to-treat, and compares the treatment group to a randomized control group, all of which are methodological strengths. However, the present study is limited by the self-reported measures of financial knowledge and behavior. The sample is somewhat unusual in that it consists of a high proportion of married women, reflecting the predominately female workforce employed by credit unions and other savings institutions.

Methodologically, the findings of this analysis support the call for more rigorous program evaluations in the financial education field. Ideally, this experiment would have included within credit union randomization. Nonetheless, it is unlikely that employees selected a credit union based on the offer of the online education program. It is also unlikely that employees' baseline financial literacy and behavior were related to a credit union's assignment into the treatment or control group. Overall, the financial education field is in need of higher quality longitudinal evaluations across a variety of interventions including online education approaches.

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Endnotes

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