ISSN 1936-5330

THE FEDERAL RESERVE BANK *of* KANSAS CITY
COMMUNITY AFFAIRS DEPARTMENT

Weighing the Effects of Financial Education in the Workplace

Kelly D. Edmiston, Mary C. Gillett-Fisher and Molly McGrath

October 2009
RWP 09-01

WEIGHING THE EFFECTS OF FINANCIAL EDUCATION IN THE WORKPLACE*

Kelly D. Edmiston
Senior Economist
Community Affairs Department
Federal Reserve Bank of Kansas City
Kansas City, MO

Mary C. Gillett-Fisher
Agriculture Marketing Specialist
Dairy Programs, Agricultural Marketing Service
United States Department of Agriculture
Washington, DC

and

Molly McGrath
Community Affairs Advisor
Community Affairs Department
Federal Reserve Bank of Kansas City
Omaha, NE

October, 2009

* The authors would like to thank Erika Ramirez of the Federal Reserve Bank of Kansas City and Julie Kalkowski of the United Way of the Midlands (Omaha, Nebraska) for research support. We would also like to thank Shawn Macken, Robert Nutt, and Austin Imhof of Waddell & Reed Financial Advisors and Jana Castanon of Consumer Credit Counseling Service of Greater Kansas City for providing opportunities to collect data for this research project. Finally, we would like to thank the numerous employers and their employees who participated in the program and the research project. The views expressed in this article are those of the authors and do not necessarily represent the views of the Federal Reserve Bank of Kansas City, the Federal Reserve Board of Governors, or the U.S. Department of Agriculture.

WEIGHING THE EFFECTS OF FINANCIAL EDUCATION IN THE WORKPLACE

Abstract

The case is often made that financial education leads to improved financial decisions. In this paper, we begin by assessing the need for financial education by reviewing national trends in savings, debt, and retirement funding as well as by reviewing the literature linking personal financial behavior and participation in financial education programs. We then describe the conceptual underpinnings of a link between improved personal financial behavior and work outcomes. Finally, we evaluate the efficacy of a specific workplace financial education program utilizing surveys and interviews with employees and employers. Our findings suggest that for the participants in this specific program, financial education did improve personal financial outcomes, and we found some evidence of improvements in work outcomes. Examples of improved work outcomes include decreased requests for 401k loans and pay advances; increased use of flexible spending accounts; increased 401k participation and contributions; and increased satisfaction with employee financial situations, and subsequently, decreased level of financial stress. Finally, in an appendix, we utilize the results of the survey data to study the relationship between financial knowledge and financial behavior.

WEIGHING THE EFFECTS OF FINANCIAL EDUCATION IN THE WORKPLACE

Most personal finance guides agree on basic principles of personal finance. Most fundamental are budgeting; paying bills on time; saving for emergencies, large-ticket items, and retirement; and limiting unsecured debt so that it does not become a burden on household finances.

In January, 2009, revolving consumer debt totaled over $961 billion, and total consumer debt, excluding home mortgages, reached $2.6 trillion (Jump$tart Coalition for Personal Financial Literacy). The median value of outstanding debt for families holding debt increased 27 percent in just three years (from 2004 to 2007; Federal Reserve Board). Personal bankruptcies increased by 29 percent from 2007 to 2008 (Administrative Office of the U.S. Courts). Moreover, the national savings rate was negative before the current recession (Bureau of Economic Analysis; Figure 1). Most Americans are ill-prepared for retirement, while at the same time, the degree to which Social Security can fund retirement is becoming increasingly lower for future generations.

Many assert that financial education is the solution, at least in part, to the poor financial condition of many Americans and that increased financial literacy will lead people to make better decisions with their money. In this paper, we study a unique workplace financial education program, and using employer/employee interview data and survey data from employees of several large corporations, we demonstrate a relationship between financial education and financial behavior for this group. We also explore the ways in which workplace financial education affects employers' costs, and therefore, their bottom lines. Finally, in an appendix, we

also demonstrate that, at least for people sharing the characteristics of these employees, financial condition is highly related to knowledge of personal finance concepts.

The article proceeds as follows. Section I describes the financial education program we studied and outlines the research design. Section II then addresses the need we see for more financial literacy. Section III presents concepts underpinning our hypothesized relationship between financial education, financial behavior, and work outcomes. Section IV presents survey and interview results demonstrating the empirical relationship between financial knowledge, financial behavior, and work outcomes, followed by conclusions in Section V. An appendix discusses the relationship between financial knowledge and behavior, as determined by our surveys.

I. PROGRAM AND STUDY DESIGN

The Financial Education Program

A 2004 report from the Federal Reserve Board of Governors highlighting the negative impact of financial stress on workers, coupled with a dramatic increase in the number of calls for assistance with basic needs to the United Way of the Midlands' (Omaha, NE) 211 hotline, prompted staff from the Federal Reserve Bank of Kansas City and United Way of the Midlands to work together to create a model to deliver effective financial education to working adults.

Building on research and experience with existing programs, staff identified three critical components of successful financial education programs: (1) competent trainers experienced in teaching adults; (2) certified financial planners to help households develop financial goals and plans; and (3) program delivery in the workplace.

The resulting financial education program was originally piloted at the Federal Reserve Bank of Kansas City's (FRB) head office and its branch office in Denver, Colorado in 2005. Consumer Credit Counseling Services of Greater Kansas City provided the training and personal financial coaching.

Due to the success of the FRB pilot, the United Way of the Midlands (UWM) issued a Request for Proposals (RFP) to select and approve program providers in Omaha. After reviewing written proposals, potential providers were interviewed and did "audition" presentations. Two providers were selected: Family Housing Advisory Services (of Omaha, NE) and Waddell & Reed Financial Advisors (herein Waddell & Reed). Employers then chose their preferred provider

In order to encourage employers to test the program, UWM raised $10,000 to pay for the cost of three pilot sites in Omaha. Employers were given a choice between the two approved providers, and all three selected Waddell & Reed. The FRB, UWM, and Waddell & Reed then worked together to finalize the program details. Classes began in May, 2006, and since then, over 700 people have completed the program.

The program, which continues to be implemented at several companies today, is set up with a classroom component and a one-on-one component. The classes are one hour long and meet once a week for nine weeks. The classes cover the same material common in most financial education courses – budgeting, credit, taxes, etc. The one-on-one component, which requires participation from spouses consists of an initial series of three to five meetings to develop a financial plan with a financial advisor and then periodic reviews over the course of a year.

This workplace financial education program utilized the strengths of all three of its principals to create a successful public-private partnership: research and evaluation from the

FRB; competent training and financial consulting from Waddell & Reed; and vetting, funding and recruitment of employers by UWM.

The program is based on a wellness model. This model has been used by the Wellness Councils of America for approximately 20 years. It is similar to working with a physical fitness trainer. Advisors serve as coaches, who provide accountability and strong, realistic expectations. People see professionals for other areas where they lack expertise such as doctors, mechanics, and personal trainers, and this program is based on the reasoning that people who need help managing their finances should also seek the same form of guidance.

Wellness models try to move people along the Awareness – Education – Behavior continuum. Within this program, the information sessions at the company represent the awareness component of the program and offer employees a chance to enroll. The in-depth classroom component with an attendance requirement represents the education component. This component is important because it provides not only knowledge, but also motivation, and prepares the participants for the one-on-one sessions. Finally the individual sessions with the advisors (as well as phone calls and emails) represent the behavioral component.

Survey and Methodology

Financial data often are hard to come by, due largely to privacy concerns of consumers. Indeed, Campbell (2006) argues that "it may be more unusual today for people to reveal intimate details of their financial affairs than to reveal details of their intimate affairs" (p. 1555). Most data that are available are derived from surveys, and that is what we predominantly use in this study. Data was collected from questionnaires administered to employees at several corporations in the Kansas City, MO and Omaha, NE metropolitan areas. These included a major financial institution, a large health care establishment, a chain restaurant, and a retail enterprise with

multiple locations. In all cases, employees had the opportunity to enroll in a personal finance course that included nine to ten hours of classroom instruction, one-on-one counseling with a consumer credit professional, and access to a certified financial planner. All course participants were asked to complete a survey questionnaire. Initial questionnaires were also administered to individuals who were not enrolled in the course, allowing for an enrolled subset and a non-enrolled subset of employees.

Survey results were used to gauge financial knowledge, as determined by score on the last nine questions of the survey, and financial behavior. Questions regarding financial behavior were designed to elicit hard details on finances rather than self-reported behavior. Financial behavior was then inferred from the financial details.

Individuals enrolled in the course were asked to complete a questionnaire prior to the first classroom instruction sessions. Questionnaires were self-administered with respondents recording an identifier code in place of their names to ensure confidentiality and promote confidence in providing sensitive information accurately. The 9-digit code consisted of the initials of the respondent's mother's maiden name, followed by her 6-digit birth date. This code is easily recalled, which negates the need for a master list of codes, and no personnel information held by the institution would be sufficient to identify the respondent. The identifier code was used for all materials submitted by the respondent, allowing the information collected from each of the questionnaires administered at various intervals to be matched.

Roughly three years after the pilot cohort participated in the program, we conducted formal interviews with a random set of course participants as well as employers, largely human resources professionals. Participants were asked the same basic questions, along with follow-up questions. We also made requests for hard data, when possible, from the human resources

professionals. Interview data was used to supplement survey data on the relationship between financial education and behavior and provided most of the results on the relationship between financial education and work outcomes.

II. THE NEED FOR FINANCIAL EDUCATION

As early as the 1920s, scholars were lamenting the rise of a consumption-oriented society in the United States and what was seen as the manipulation of consumer beliefs and attitudes by advertising (Lynd and Lynd, 1929). The implication is that Americans as a whole over consume.

Whether or not one "over consumes" is subjective and varies from person to person according to preferences and life situations. However, the notion that optimal consumption behavior over a lifetime necessitates consumption smoothing is well-established (Kotlikoff, 2008a). In simple terms, consumption smoothing means keeping standard of living rather constant across one's lifetime (and a comparable living standard for survivors, should the consumer meet an untimely death). In most cases, this means borrowing when young, saving in peak earning years, and drawing down savings in retirement.[1]

Numerous studies have shown that consumption tends to drop rather dramatically for many people at retirement (Hammermesh, 1984; Banks, Blundell, and Tanner, 1998; Bernheim, Skinner, and Weinberg, 2001). Even recognizing that consumption smoothing does not necessarily (or even likely) mean maintaining a consistent level of consumption throughout the life-cycle, the conclusion of many of these studies is that most workers do not save enough to

[1] Optimization does not always result in smoothed consumption over the lifecycle or mean that the same pattern of consumption would be optimal for households with similar incomes. An inability to borrow, or a limit to which one can borrow, can fundamentally alter the decision calculus. Moreover, households with children would likely see a much different consumption pattern than a household with similar income but no children. There is voluminous research on consumption over the life-cycle, and the present discussion is highly simplified. See Browning and Crossley (2001) for a detailed, yet approachable discussion of life-cycle consumption issues.

maintain optimal consumption in their retirement years. In some ways, the dearth in savings seems to have become more pronounced in recent years.

In the late 1970s and early 1980s, the U.S. saving rate ranged between eight and ten percent (Figure 1). By the third quarter of 2005, the U.S. savings rate had dipped below zero. In the second quarter of 2009, the savings rate picked up to 5.0 percent as the recession further entrenched. The July, 2009 savings rate, the latest date for which data were available at writing, had dipped to 4.2 percent.[2] Each one percentage-point increase in the savings rate is associated with a decrease in spending nationally of $100 billion (Atkins and Lund, 2009). Time will tell if the pick-up in savings is a permanent change in American financial patterns or if Americans will return to previous consumption patterns once the economy improves. Regardless, in the period immediately preceding the current recession, national saving seemed inadequate for optimal consumption smoothing.

Of course, the balance of accumulated retirement savings is as important as, if not more important than, the savings rate. According to the Federal Reserve's 2007 Survey of Consumer Finances, just over half of families held financial assets in a retirement account in that year, and the median value of holdings in retirement accounts was only $45,000 (Bucks et al., 2009). Into 2009, stock index values had eroded significantly from the time of the consumer finance survey, suggesting that retirement holdings were likely considerably less.[3] There is no guarantee that even this small amount in the average account will be available for retirement, however, as a significant share of employees cash out their 401(k)s when they change jobs. A 2005 study by Hewitt Associates of nearly 200,000 workers who participate in their 401(k) plans found that 45

---

[2] "Personal Income and Outlays," press release, Bureau of Economic Analysis, August 28, 2009.
[3] The S&P 500 index on March 9, 2009 was at a 12-year low. By early September, the index had climbed over 40 percent from its bottom. Nevertheless, the index remained 38 percent below its October, 2007 peak.

percent elected to cash out their plans upon leaving.[4] While the youngest workers (ages 20 – 29) were most likely to take a cash distribution upon leaving (66 percent), fully 42 percent of those aged 40 – 49 cashed out their 401(k) plans.

Social Security was not designed to provide sufficient retirement income for most people, but many rely on Social Security benefits to finance retirement with little else to complement that income. A 40 year-old earning $15,000 per year and retiring in 2038 would earn only half of his pre-retirement income in Social Security benefits (estimate) (Figure 2). The benefit ratio declines sharply from there. An income of $102,000, the 2008 ceiling for FICA contributions, would yield only 24 percent of pre-retirement income in benefits. In ensuing years, there is some probability that the Social Security program will provide substantially fewer benefits, as the 2008 Trustees Report predicts that without significant changes in the system, the Social Security trust fund will begin incurring deficits in 2011 and will be expended by 2041 (Board of Trustees, 2008).

While the evidence suggests that many Americans are saving too little compared to the amount they would need to save to adequately smooth consumption over time, the reader should keep in mind that under consumption is also possible; that is, saving *too much* for retirement. Further, the optimal share of income saved (for the purpose of smoothing consumption) can vary significantly across households. For example, given the structure of Social Security, lower-income households' optimal savings rate would likely be much lower than that of high-income households in most cases (Bernheim et al., 2000).

---

[4] "Cashing out" means withdrawing 401(k) balances in the form of cash, rather than retaining the balances in the previous employer's 401(k) account or "rolling over" the balances to an IRA. While some of these cash balances could eventually be contributed to an IRA, it is unlikely that an employee would withdraw cash, pay taxes and fees, and then redeposit in a retirement account when a rollover would save the taxes and fees. The sources is "Hewitt Study Shows Nearly Half of U.S. Workers Cash Out of 401(k) Plans When Leaving Jobs," Press Release, July 25, 2005. Accessed on May 2, 2006 at http://was4.hewitt.com/hewitt/resource/newsroom /pressrel/2005/07-25-05.htm

While we hesitate to label any particular financial behavior "good" or "bad," as each household has different income streams, wants, needs, and risk tolerances, we note that personal finance guides generally prescribe certain behaviors as basic to financial well-being and security beyond saving for retirement (or consumption smoothing generally).[5] Chief among these is debt management.

The Wall Street Journal's personal finance guide defines "good debt" and "bad debt" (Opdyke, 2006). Good debt "improves your life for a long time" (p. 23), while purchases are financed with bad debt "if you consume it, if it loses value over time, or if you have to feed it" (p. 25). We would argue that some debt-financed consumption is "good" if it helps the borrower smooth lifetime consumption. Nevertheless, Americans as a whole are accumulating large amounts of debt, and arguably, too much debt. *The Wall Street Journal*'s personal finance guide suggests that a "bad-debt load" greater than 20 percent of take-home-pay is problematic.

In 2007, roughly three-quarters of families held some kind of debt, including almost 90 percent of families with a head aged 35 – 54 (Bucks et al., 2009). In 2007, 46 percent of families held installment debt, a roughly equal number held credit card debt, and 48 percent held debt secured by a primary residence.

As noted above, there is nothing inherently bad about holding debt. Optimal consumption smoothing would likely require the accumulation of some debt in early years for most people. But debt is rising faster than income, and many people are finding that they have accumulated more debt than they can manage. Most people would agree that unmanageable debt is too much debt. The overall median value of outstanding debt for families holding debt

[5] See, for example, Opdyke (2006), Downey (2005), Federal Reserve Bank of Dallas (2008), and Federal Deposit Insurance Corporation (2001).

increased 27 percent between 2004 and 2007, to $60,700. By comparison, median income actually decreased by 0.4 percent over the same period.

Debt as a percentage of total assets rose from 12.1 percent to 15.0 percent from 2001 to 2004 and remained there in 2007. The share of homeowners with home-secured debt who had junior liens rose from 6.1 percent in 2004 to 8.5 percent in 2007. Debt payments as a share of family income rose from 12.9 percent in 2001 to 14.4 percent in 2004 to 14.5 percent in 2007. In the 2004 Survey of Consumer Finances, 8.9 percent of families reported having at least one payment past due 60 days or more. By the 2007 survey, that share had declined significantly to 7.1 percent, but sour economic conditions in late 2007 into 2009 have increased credit delinquencies significantly. Fitch's Prime Credit Card Delinquency Index, which measures credit card payments more than 60 days past due reached 4.37 percent in June, 2009, off just seven basis points from its all-time high the previous month (Lagorio, 2009). Fitch's Prime Credit Card Chargeoff Index surged 77 basis points to a record 9.66 percent.

Personal bankruptcy filing rates increased markedly, at a compound annual rate of 6.4 percent, from 1980 to 2006, climbing from 13 filings per thousand people to 59. Personal bankruptcy filings dropped off rather dramatically from 2006 through 2008, likely due in large part to the *Bankruptcy Abuse Prevention and Consumer Protection Act of 2005*. There are signs that personal bankruptcy filings are on the uptick, however. In 2008, 871,186 personal bankruptcies were filed in the United States, up 29 percent from 2007 (Administrative Office of the U.S. Courts). Mortgage delinquencies increased from 4.4 percent in the second quarter of 2006 to 8.9 percent in the second quarter of 2009 (Mortgage Bankers Association). While this increase in mortgage delinquencies can be explained in part from declining real estate values, an

economy in recession, and nontraditional mortgage products, many homeowners borrowed more than they could afford in the middle part of the decade (Edmiston and Zalneraitis, 2007).

III. FINANCIAL EDUCATION, FINANCIAL BEHAVIOR, AND WORK OUTCOMES

Financial education should work largely through increased knowledge to affect financial behavior. But beyond instilling knowledge, financial education can motivate consumers and help them to recognize potential problems, pitfalls, and opportunities to which they may otherwise not have been exposed. Bernheim (1995) notes that low saving "frequently results from a failure to appreciate economic vulnerabilities." This section examines the conceptual link between financial education and behavior, allowing for effects of financial education beyond the impact on financial knowledge. For example, practice and peer effects, which are not directly linked to financial knowledge, could nevertheless affect financial behavior. The section also presents concepts underpinning our notion that financial education can affect work outcomes.

Existing Studies of Financial Education and Behavior

Studies that have examined the behavioral effects of financial education generally support the notion that financial instruction improves financial behavior, although there are significant exceptions. Several recent reviews have found significant positive impacts of financial education on personal financial behavior (see, e.g., Bernanke, 2006; Lusardi and Mitchell, 2007; Martin, 2007). However, other studies find little impact of financial education programs, due at least in part to design issues (see, e.g., Hathaway and Khatiwada, 2008; Willis, 2008).

When offered in the workplace, financial education has been shown to increase participation in and contributions to savings plans (Bayer, Bernheim, and Scholz, 1996).

Similarly, retirement planning seminars offered by an individual's employer have been found to promote savings, leading to an increase in the total net worth of seminar participants (Lusardi, 2004). The 2003 – 2004 evaluation of the HSFPP showed a "significant improvement" in financial behavior among participants three months after taking the course (Danes, Huddleston-Casas, and Boyce, 1999, p. 52). Both employer and school-based financial education programs have been shown to improve household knowledge of relative asset returns and reduce employees' ignorance of their pension plans (Maki, 2001). Among low- and moderate-income savers, participation in a financial education course leads to an increase in both retirement and overall savings (Bernheim, Garrett, and Maki, 2001).

Findings on the effectiveness of school-based financial education programs are not uniform, however. Cole and Shastry (2008) conducted a study challenging the Bernheim et. al. conclusion that individuals in states with financial education mandates, who graduated five years after the mandates went into effect, saved 1.5% more than those who were not as likely to be exposed to the financial education because of the time they graduated in comparison to when the mandates were imposed. Cole and Shastry find that financial market participation (measured by "income from interest, dividends, net rental income, royalty income, or income from estates and trusts" from the U.S. Census) was higher than historic levels in the states with mandates before they went into effect, and it did not increase after the mandate. They conclude that the mandates were implemented during periods of higher than normal state economic growth and that this may be the cause of the increased financial market participation rates both before and after the mandate.

The majority of retirement education studies have found a positive relationship between financial education and retirement planning behaviors. Some of the benefits of financial

education offered by employers include both enhanced knowledge about financial decision-making gained by participants and reduced costs of retirement planning (Lusardi, 2004). Specifically, participants in retirement planning seminars are more likely to increase their retirement goals, start new tax-deferred savings accounts, increase contributions to current retirement plans, and reallocate their investments (Clark et al., 2003). Retirement planning seminar attendance also appears to increase financial wealth and net worth across all education and income groups, with the greatest increases occurring in the lowest portion of the income distribution (Lusardi, 2004). Participation in self-directed retirement plans, in particular, can be influenced by contribution matching schemes and frequent retirement education seminars offered by employers, with the strongest effects noted among non-highly compensated employees (Bayer et al., 1996). Consistent with the findings of both Lusardi (2004) and Bayer, Bernheim, and Scholz (1996), Bernheim and Garrett (2003) found that the availability of financial education in the workplace stimulates retirement savings among individuals in the lowest half of the savings distribution. Women enrolled in a financial education seminar that focused on retirement planning and used a workbook-based curriculum were found to have increased their ability to set up a retirement plan as well as their ability to review and adjust the goals set forth by their plans (DeVaney et al., 1995). Similar to the findings of DeVaney et al. (1995), Joo and Grable (2005) found that Retirement Confidence Survey respondents who had participated in a financial education program were more likely to have a retirement savings program in place.

While the number of studies relating financial education to retirement planning is quite large, a substantial amount of work exists that examines other factors related to or affected by financial education. Loibl and Hira (2005) found financial management behaviors, as well as financial and career satisfaction, to be significantly related to self-directed financial learning.

Additionally, they found good financial management practices to be positively correlated with greater financial and career satisfaction. Other studies that have examined the effects of specific types of financial education have found that individuals who participated in credit counseling reported being in better financial shape and practicing more favorable financial behaviors following the experience (Sorhaindo, 2003; Elliehausen, Lundquist, and Staten, 2007).

Financial Education and Employer Outcomes

There are potentially several ways that the financial condition of employees can affect an employer's bottom line, many of which are listed in Garman, Leech, and Grable (1996). Some are direct, while others are indirect.

Perhaps the most direct way that employee financial problems can affect employers' bottom lines is through wage garnishment, which is costly to the employer. There are substantial guides for garnishment procedures and issues, and employers must comply with numerous regulations, including garnishment limits. These costs are difficult to recoup because employers cannot charge a fee or dismiss an employee for garnishment.

Another direct way an employer's bottom line can be impacted by employee financial behavior is through 401(k) savings. Nondiscrimination tests require a balance between 401(k) contributions for highly compensated employees and lower compensated employees. A lack of saving on the part of low compensation employees can tie the hands of an employer who wants to attract talent through more generous retirement benefits. Financial education may offer a way to encourage more saving among relatively low compensation employees. At the same time, financial education can help employers comply with fiduciary responsibilities under ERISA, which require a minimal level of financial education in order to reduce liabilities for poor retirement decisions of employees.

Participation in flexible spending accounts brings substantial cost savings for employers, as they do not pay FICA or Medicare taxes on money employees contribute to their accounts.

Other direct costs of employee financial problems may include theft and embezzlement, absenteeism, and spending time on the clock dealing with personal financial problems. A simple Internet search of "embezzlement" and "financial stress" reveals numerous examples of cases where financially stressed workers resorted to theft and embezzlement. Walpert (2000) suggests that employers monitor employee financial stress as a method of reducing the likelihood of theft and embezzlement. Kim and Garman (2004) find statistically significant evidence that employees in a "high financial stress" group used more work time handling financial matters and were more frequently absent from work than those in moderate or low financial stress groups.

Financial problems often lead to general stress (Drentea, 2000; Mills et al., 1992), and stress has been shown in numerous studies to be detrimental to workplace productivity. For example, in a study in the 1980s, 22 hospitals implemented stress prevention activities, resulting in a 70 percent reduction in malpractice claims (Jones et al., 1988). In contrast, there was no reduction in claims in a matched group of 22 hospitals that did not implement stress prevention activities. A recent Department of Defense study cited personal financial problems as one of the top four causes of lost productivity in the military (Luther et al., 1997; Luther et al., 1998). Many similar studies are discussed in detail in Joo (1998). Reductions in the stress caused by personal financial problems, in addition to enhancing productivity, may also reduce workplace violence (Howard, 2001; Brown, 1999) and accidents. The American Institute of Stress suggests that 60 – 80 percent of work accidents result from stress.[6]

[6] See http://www.stress.org/job.htm, accessed July 6, 2006.

IV. RESULTS

This section evaluates the relationship between financial education and behavior using data from our participant before-and-after surveys, supplemented with evidence from personal interviews with program participants and employers. We also evaluate the impact of workplace financial education programs on employer outcomes, which comes largely in the form of cost savings. Given the difficulty of collecting hard data on employer outcomes (for example, productivity data), this discussion relies largely on personal interviews. The discussion of results is followed by an examination of the potential limitations of our analysis. In an appendix, we provide data gleaned from the initial participant surveys and non-participant surveys on the relationship between financial knowledge and behavior, where we found a strong link.

Survey Results

Our before-and-after results suggest that the programs implemented in our study companies achieved some substantial successes, and results provide evidence that financial education in the workplace provided benefits for the companies that implemented the program, as well as for the program participants. We had follow-up surveys for about 30 percent of enrollees.

The most basic tenet of personal financial education programs is the use of personal budgets and timely payment of bills. On this score, our surveys show largely positive outcomes. There was a modest increase overall in the share of survey respondents using formal budgets. The results show that a significant number of participants began budgeting after completing the program, but peculiarly, some who had initially reported budgeting reported no budgeting on the follow-up survey. Our explanation for this finding is that participants got a very different idea about what constitutes budgeting over the course of the program, and some realized that they

were not budgeting in the way the course suggested. That being the case, in terms of actual behavior modification, the result of the program was to successfully encourage participants to use formal budgets.

A substantial number of program participants reduced the number of bills they paid late, and a modest decrease in current delinquency was reported. This result contrasts with increased credit card and mortgage delinquencies nationally over the same period noted above. Several of those we interviewed noted that they were now using automatic bill payment and had ceased using payday lenders.

Results on credit usage were largely positive. The share of respondents who paid off their credit card balances every month increased by a remarkable 50 percent. The majority of balances declined, especially for those who had relatively small balances to begin with, compared to an 11.2 percent increase in revolving debt balances over the same period nationally (Federal Reserve Board, series G.19). Total installment debt decreased by 14.5 percent. By comparison, over the same period, non-revolving debt nationally increased by 5.8 percent.[7] Evidence from the human resources department at our retail site showed a significant reduction, indeed, an eradication, in 401(k) loans. To date, from the time of the program's commencement in 2007, none of the participants have requested a 401(k) loan, although doing so is quite common across the establishment. The trend nationally is in the opposite direction: more 401(k) loans – and early withdrawals (Trejos, 2008).

In terms of savings behavior, our results also were generally positive. Unfortunately, because of a lack of clarity in one survey question, our results on total savings as a percentage of

[7] Both revolving and non-revolving debt has declined since the third quarter of 2008 through the second quarter of 2009, the latest quarter for which data were available at writing.

income are unreliable.[8] Nevertheless, we believe we can reasonably assert that savings as a whole increased. First, the share of income saved for retirement increased by 13 percent. Secondly, money balances in 401(k) plans increased 70.3 percent in the three years following the program, in a declining stock market.[9] By contrast, for the U.S. as a whole, 401(k) contributions dropped by 27 percent in 2008 (Investment Company Institute). For the study cohort, money balances in individual retirement accounts (IRAs) increased 51.3 percent, and money balances in non-retirement accounts increased by 31.4 percent. In a recent national study by the Employee Benefit Research Institute, 401(k) balances were found to have decline 15 percent between the end of 2007 and June, 2009 (Hall, 2009).

Hard information obtained from human resources departments mostly reinforced our survey findings on savings. For the retail establishment we surveyed, 65 percent of participants in the financial education program were enrolled in the company's 401(k) program at the beginning of the program, but following the program, 100 percent of enrollees were participating in the 401(k). For employees not participating in the program, there was little change in 401(k) enrollment. By comparison, in a recent AARP survey over a period similar to that of the study period, about 20 percent of working adults over the age of 45 stopped contributing to 401(k) plans (Costa, 2008). The participants who had retirement accounts before enrolling in the study program increased their contribution rates by between 2 percentage points and 15 percentage points. By comparison, over the three quarters ending June, 2009, a net number of Fidelity Investments customers cut their contributions in terms of percentage of pay (Jewell, 2009).[10]

---

[8] In our follow-up survey, reported retirement savings rates often exceeded reported total savings rates, suggesting that a significant number of survey respondents may have reported only non-retirement savings for total savings in the second-round survey.

[9] A substantial share of 401(k) funds were invested in fixed income securities, which largely increased in value over the time horizon, and cash.

[10] After a significant search, no information could be found on percentage of pay contributed to 401(k)s nationally over the study period.

Changes in the financial sophistication of program participants, as measured by the use of a variety of financial instruments, were largely unremarkable. There was little to no difference in the number of participants with savings accounts and money markets. Few had money market accounts before or after enrolling in the program. Surveys showed modest increases in the number of participants with mutual funds and certificates of deposit, and a moderate decrease in the number holding individual stocks. The latter result may reflect greater awareness of risk.

As noted earlier, survey results can provide only limited information on the relationship between financial education and *workplace* outcomes, but there was some. There was no change in the number of participants who had costly wage garnishments according to our surveys, but there was some evidence of a reduction in garnishments in the interview data, which covered all participants. Where we did see a significant change in the survey data is in a large increase in the share of participants who felt satisfied with their financial situation two to three years following enrollment. Although we have no way to measure stress directly, based on research discussed above, we expect that increased financial satisfaction leads to reduced stress. Finally, prior to completion of the program, 45 percent of enrollees in our surveyed retail establishment participated in a medical flexible spending account, which saves money for the employer by avoiding FICA taxes. Two to three years following enrollment, 70 percent of participants had medical flexible spending accounts. There was little change in the number with dependent flexible spending accounts, but few were utilizing that tool to begin with.

Potential Limitations of the Survey Results

An important limitation of the present study, and most like it, is the lack of a closely monitored control group. The problem is that the people who choose to participate in a financial education program; that is, those who self-select into the program, may be more motivated to

improve their financial position than those who choose not to participate. An additional problem is that, over the course of the study, national economic events may have altered approaches to personal finances for many, such as saving behavior.

With selection bias, improvement in financial behavior following participation in the financial education program could reflect motivation as well as direct benefits of the program, and thus, the effects of the financial education program itself could be overestimated. Ideally, one would use a randomized, controlled experiment, but that is not always possible in program evaluation because most treatment programs are voluntary. In our case, employers were understandably unwilling to require the participation of their employees or to refuse participation in the program for a select cohort of employees. In most cases, admittance to the program was on a first-come, first-served basis. The non-enrolled cohort surveyed at the commencement of the program was not a captive cohort like the enrolled group, which made post surveys untenable..

In an effort to identify potential selection bias in our sample, we compared the personal attributes between enrolled and not enrolled cohorts (Table 1). The interview responses showed a variety of general backgrounds, goals and financial situations (not shown in table). Participants ranged from entry-level to executives, from those making less money struggling to afford basic living expenses to those making more money but in similarly tight situations because they were overburdened with debt.

Gender, race, ethnicity, and marital status differed little across the cohorts, but there were important differences in income and previous exposure to financial education. Roughly 57 percent of the enrolled cohort had incomes below $50,000, compared to only 19 percent of the

non-enrolled cohort. Importantly, however, we note that the average score on the knowledge test was virtually identical between the two groups (see appendix).

We expected the non-enrolled cohort would have more previous exposure to personal financial education, as those previously exposed would be unlikely to enroll in a similar course, at cost. There were some modest differences in educational attainment between the cohorts, with the unenrolled cohort being relatively higher educated.

Self-selection bias is ubiquitous in the financial education evaluation literature (Meier and Sprenger, 2007; Willis, 2008; Hathaway and Khatiwada, 2008; Collins and O'Rourke, 2009). Unfortunately, the potential for bias is unavoidable in the absence of a controlled experiment. While self-selection bias may be present in our analysis, our study design mitigates some potential problems. First when possible, we incorporate comparable national data for the period of the study in an effort to compensate for the inability to compare the results of a control group. The effort is similar in concept to an experiment with a comparison group. Second, in the case of the retail establishment and healthcare establishment in our study, a significant number of employees had participated in the program, which likely minimized the bias. The program will eventually be offered to all employees in these companies. Third, our evaluation of the relationship between financial knowledge and behavior should not be affected by self-selection, as the pre-survey was administered to employees who did not participate in the financial education program, along with those who did (see appendix). Finally, our follow-up surveys asked for specific personal financial data, rather than self-assessments of how the course changed their behavior, which is typical of most studies.[11] In self-assessments, the participants who changed their behavior would be more likely to respond to the follow-up (Lyons et al.,

[11] Willis (2008) suggests that even this type of questionnaire could be problematic because "people who have experienced good outcomes are more likely to think they 'learned' from a class and to remember taking one at all" (p. 206). Willis provides no empirical evidence of this potential, and we find the reasoning suspect.

2006), and participants generally may be inclined to overstate the effects (Bernheim and Garrett, 2003). With one exception, our follow-up surveys were administered by the Human Resources Departments in the surveyed companies, with follow-up of the participants.

Results from Interviews

As a result of the program, several participants reported having a better idea of the money they had – that they had more than they had thought. A key goal of the financial education program we evaluated is to help participants understand how people make decisions and then to apply that knowledge to financial decisions, so they can reach their goals. Participants' goals ranged from being able to pay cash for an unexpected medical bill, to being able to go to Wal-Mart and buy whatever they need, to saving for a house, to saving for retirement. Many program participants cited how they had more money than they thought they did, and the program was more about making better decisions with their money in order to reach their goals, not necessarily about increasing their income.[12]

Many participants cited the accountability that arises from working with an advisor as well as the support of their co-workers in the class as very helpful in achieving their personal financial goals. One participant said that her entire department completed the first class together and encouraged each other in the endeavor. The advisors provide accountability by helping the employees develop and implement a plan to reach their financial goals and following their progress towards meeting those goals. One employee said that the biggest benefit for her was talking about her goals and putting them in writing. Several of the participants interviewed are still working with their planners. The participants who are not working with their planners mostly said it was because they do not feel they need the planner anymore. They are now working on their plans without the assistance of the advisor. The importance of having a plan

[12] Nevertheless, increasing income is an often over-looked means of dealing with financial difficulties.

was evident throughout the interviews with participants responding by saying, "I feel in control now," "it's nice to be out of reactive finances and into constructive finances," and "even if we are months or years away from our goals, we are still less stressed because we have a plan and we're doing something about it."

Almost all of the participants we interviewed mentioned that they were no longer carrying over additional credit card debt when asked how their financial lives were different following the program. One participant shared how after her divorce, she would shop to feel better and put her purchases on a credit card. She explained that she did not realize how this credit card usage would affect her credit score and therefore the rate she would be offered on her mortgage when she needed to purchase her home. She paid off the $5,000 in consumer debt she owed six months ahead of her schedule, which was part of the plan she put together with her financial advisor. Her credit score went up 20 points, and she was able to refinance her home at a rate of 4.8 percent, down from six percent. Many participants described how the program helped them understand debt and where it does and does not help them. For example, one participant stated she now only holds debt for her house and car, "not hairspray from college." Another explained that she never thought about the fact that when "you use your credit card at McDonald's, you are paying interest on a Coke," and the class helped her to put consumer debt into perspective.

A key theme that was evident throughout the interview process is the importance of building savings, especially the importance of building an emergency fund. One of the main reasons people incur debt is because they do not have savings. As unexpected bills arise, many do not have the excess funds to pay for them. Part of all financial plans was to start building an emergency fund right from the beginning, with the goal being to pay off debt while building

savings. The reasoning behind this strategy is that one will likely end up incurring debt again when the next unexpected bill presents itself if that person focuses only on paying off debt and not on building savings until the debt is paid off.

Many participants described that they now had the necessary funds should a contingency arise, and they do not have to put the cost on a credit card. One employee explained that she now has an emergency fund of $12,000. Her brakes had gone out the day before the interview and she had the $330 to pay for it. Moreover, two months prior, she had an unexpected $450 expense and was able to deal with it with less stress because she had the funds to cover it. Another participant described how her mother went from earning $2,000 to $600 every two weeks. She was one month away from paying off her $10,000 credit card debt, and then began taking care of her mother. Through the planning process and the emergency fund she had built, she was able to take on her mother's debt as well as many of her expenses.

Almost all of those interviewed discussed additional planning for retirement, which was true for participants with a variety of backgrounds. One employee was in the process of filing for bankruptcy when the class started and is now saving for retirement, while another stated that although she did not struggle with finances, she did not have a plan for retirement. Now she and her husband have clear goals on this issue and are taking the steps to achieve them.

Many money-related family problems were reportedly mitigated by the financial education program. Employees had the option of bringing their spouses to the classes and their households to the planning sessions. One participant said her son now asks if things he wants to buy are too expensive, and he understands when they cannot do something until later because they cannot afford it yet. Another employee said the program affected how she felt about herself because she no longer had to rely on her parents, and that her parents were proud of her when she

returned to school and graduated. She then invited them to a planning session and they started meeting with an advisor as well. Finally, one employee described the program as "no less than life-changing and certainly relationship changing for my marriage."

One participant was in the process of getting divorced and left from the first few visits with the planner in tears because of how her financial situation was about to change. She now feels like she has a better handle on what is to come. Another described that he was struggling with his finances and the program helped him save for an engagement ring. His wife, then girlfriend, went through the program at the same time and it helped them develop common goals. Since the program they have purchased a home, had two kids, and have another on the way, so they are currently practicing making the payments they will need to when the third child is born.

Family tensions, especially between spouses, can increase stress in the workplace. Many of the participants described how this program had helped their marriages and decreased disagreements over family finances, which significantly reduced stress.

Less stress was a common theme within the interview process. Participants made comments such as "it takes five minutes to send an email to my advisor as opposed to hours of work and stress dealing with some of these situations," "[I now] see money as a tool not a source of agony", and "there has been a lot of stress reduction, a lot, a lot." One employee told the story of how she had to pay for two surgeries, her son getting his tonsils taken out, and several big car repairs, but that these situations did not cause her stress because she had the emergency fund available.

Prior to implementing the financial education program, many employers were seeing signs of financial stress in the workplace, reflected in an increase in garnishments, which can be expensive for the employer. They also saw more employees coming in with questions about

refund anticipation loans, debt collections issues, and questions about payday lenders. One of the companies has interest-free salary advance loans. The management noticed that requests for these loans were getting larger and that some employees were making multiple requests. Management was becoming increasingly uncomfortable with these requests. Employees were also taking out new loans once they paid off the original loans. One of the companies also described how it began requiring the use of direct deposit, a substantial money saver, and discovered that a number of employees did not have bank accounts, many because they had struggled managing an account in the past. One employer said that he "wanted more financially stable employees."

Employers generally cited a noticeable difference in people coming in with these requests since the financial education program was implemented and that the ones who were successful no longer asked for 401(k) loans or payday advances, which are administratively costly. One employer told the story of an employee who came into quit and withdraw the funds from his 401(k), but they told him this program was about to start that could be beneficial to him. He stayed, joined the class, began to work his way out of debt with his planner, and ultimately maintained his employment with the company.

Employers also described other effects they noticed among those who had taken part in the program, saying "they had more energy," "there was an attitude change for employees," "we consider it a cost effective program because of the effect on energy," and "we now see less stress, life is better, work is better, higher engagement level at work, relationship with spouse/children better, less absenteeism, better attitude and all this will correlate with better health as well." All of the companies that hosted pilots three years ago still have the program running today and are in the process of expanding it to more employees. All of the employers

help cover the costs in different ways and two employers will payroll deduct the cost of continuing on with the planner.

One company human resources representative said she did not plan on offering the program again after the free pilot until she attended the last class. Participants shared their experiences and she remembered people saying that a "burden was lifted," there was a light at the end of the tunnel," and that "the company has to keep this program." She then had the class participants tell the president of the company the impact it had on their lives. Another company had a similar experience. One company in the pilot did not need to internally market the program, as it was the COO who chose to take part in the pilot. This employer stated that he did not offer the program because he thought it was the employer's fiduciary responsibility to do so, but because he wanted to position the company to recruit and retain the best employees and set the company apart as an employer of choice. This employer also mentioned that it was a five to ten year strategic move because of the shrinking workforce (in health care), and with over half of their employees being entry level, they might leave for 50 cents more an hour. This program was a way for them to increase loyalty.

During the last classroom session one of the authors attended, the participants described their experiences and were asked if they think this would be a good program for their companies. Two comments were made by several within the group: 1) working with the planner helped them to realistically understand where they are financially – the participants know how much money they have, what they could do with it, and what changes they would have to make in order to reach their goals – and 2) participants valued the retirement planning component, saying it is "hard to forecast and know how to prepare for retirement so really helps to have someone do that with you." With a 2008 retirement survey revealing that 53 percent of those surveyed had not

tried to calculate how much they needed for retirement, and 43 percent of employees 55 and older had saved less than $25,000 for retirement (Employee Benefit Research Institute and Mathew Greenwald & Associates, Inc.), comments like those described above can attract employers to this program as they see the potential benefits the program can have in the financial situations of their employees.

VI. CONCLUSIONS

Our results from surveys and interviews show substantial success in the financial education program we surveyed. On many measures, our surveys demonstrate that financial education programs can and do influence personal financial behavior. The survey results were largely supported by personal interviews with program participants and human resources staff. Finally, we are able to provide limited evidence that well-designed personal finance programs can positively affect the employer. Although we cannot quantify the employer benefits very easily, our findings suggest that providing subsidized financial education to employees in the workplace would likely have a net positive impact on employers' bottom lines.

According to a report published by the Fannie Mae Foundation (1999), financial education is most effective when it is most relevant and can be applied right away. General financial education programs, that is, those without the planning components in our program, have not been shown to be as effective. We believe that the planning component of the program we evaluated was critical to its success. A workplace-based program for adults is relevant for a number of reasons. First, adults are usually responsible for their own financial well-being, so the program likely resonates more with them than it would for school-aged children and teens. And second, participants learn at the place where they make their money and where they can usually

invest for retirement. This particular program we evaluated also highlights the need for specific versus general education and that "one-size-fits-all" programs are not as effective (Lusardi, 2008). The one-on-one component where employees (and their households if they choose) work with an advisor for at least a year to develop and implement a plan, in the authors' view, is integral to its success.

REFERENCES

Administrative Office of the U.S. Courts. *Bankruptcy Statistics*. Accessed May 5, 2009 at http://www.uscourts.gov/bnkrpctystats/bankruptcystats.htm.

Atkins, Charles and Susan Lund. 2009. "The Economic Impact of Increased US Savings," *The McKinsey Quarterly*, March.

Banks, James, Richard Blundell, and Sarah Tanner. 1998. "Is There a Retirement-Savings Puzzle? *American Economic Review*, vol. 88, no. 4, pp. 769 – 788.

Mason Bayer, Patrick J., Douglas B. Bernheim, John Karl Scholz. 1996. "The Effects of Financial Education in the Workplace: Evidence from a Survey of Employers," *NBER Working Paper No. 5655*, July.

Bernanke, Ben. 2006. "Financial literacy," Testimony before the Committee on Banking, Housing, and Urban Affairs of the United States Senate, May 23. Accessed June 16, 2009 at http://www.federalreserve.gov/.

Bernheim, B. Douglas. 1995. "Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy," in *Tax Policy and Economic Growth* (Washington, DC: American Council for Capital Formation), pp. 1 – 30.

Bernheim, B. Douglas, Garrett, D.M. 2003. "The Effects of Financial Education in the Workplace: Evidence from a Survey of Households," *Journal of Public Economics*, vol. 87, no. 7 – 8, pp. 1487 – 1519.

Bernheim, B. Douglas, Daniel M. Garrett, and Dean M. Maki. 2001. "Education and Saving: The Long-term Effects of High School Financial Curriculum Mandates," *Journal of Public Economics*, vol. 80, no. 3, pp. 435 – 465.

Bernheim, B. Douglas, Jonathan Skinner, and Steven Weinberg. 2001. "What Accounts for the Variation in Retirement Wealth Among U.S. Households?" *American Economic Review*, vol. 91, no. 4, pp. 832 – 857.

Bernheim, B. Douglas, Lorenzo Forni, Jagadeesh Gokhale, and Laurence J. Kotlikoff. 2000. "How Much Should Americans Be Saving for Retirement?" *American Economic Review*, vol. 90, no. 2, pp. 288 – 292.

Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds. 2008. *The 2008 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*. Washington, DC, May.

Brito, Dagobert L. and Peter R. Hartley. 1995. "Consumer Rationality and Credit Cards," *Journal of Political Economy*, vol. 103, no. 4, pp. 400 – 433.

Brown, Rodney C. 1999. "Financially-Troubled Employees and Threats of Violence Impact the Workplace." Accessed May 19, 2009 at http://www.inchargefoundation.org/.

Browning, Martin, and Thomas F. Crossley. 2001. "The Life-Cycle Model of Consumption and Saving," *Journal of Economic Perspectives*, vol. 15, no. 3, pp. 3 – 22.

Bucks, Brian K., Arthur B. Kennickell, Traci L. Mach, and Kevin B. Moore. 2009. "Changes in U.S. Family Finances from 2004 to 2007: Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin*, vol. 95, February 12.

Campbell, John Y. 2006. "Household Finance," *Journal of Finance*, vol. 61, no. 4, pp. 1553 – 1604.

Chen, Haiyang, and Ronald P. Volpe. 1998. "An Analysis of Personal Financial Literacy Among College Students," *Financial Services Review*, vol. 7, no. 2, pp. 107 – 128.

Clark, Robert L., Madeleine B. d'Ambrosio, Ann A. McDermed, and Kshama Sawant. 2003. "Financial Education and Retirement Savings." Presented at Sustainable Community Development: What Works, What Doesn't, and Why (Federal Reserve System Conference), Washington, D.C., March 27-28. Accessed February 18, 2009 at http://www.federalreserve.gov/.

Cole, Shawn and Gauri Kartini Shastry. 2008. "If You Are So Smart, Why Aren't You Rich? The Effects of Education, Financial Literacy and Cognitive Ability on Financial Market Participation." Presented at the 2009 Federal Reserve Community Affairs Research Conference. Accessed June 30, 2009 at http://www.kansascityfed.org/carc2009/ papers.cfm.

Collins, J. Michael and Collin O'Rourke. 2009. "Still Holding Out Promise: A Review of Financial Literacy Education and Financial Counseling Studies," presented at Improving Financial Literacy and Reshaping Financial Behavior, a conference of the Networks Financial Institute, Indiana State University, Indianapolis, IN, May 14 – 15.

Costa, Cheryl. 2008. "Twenty Percent of Boomers Have Stopped 401(k) Contributions," *The Boston Globe*, October 8. Accessed September 14, 2009 at http://www.boston.com.

Danes, Sharon M., Catherine Huddleston-Casas, and Laurie Boyce. 1999. "Financial Planning Curriculum for Teens: Impact Evaluation," *Financial Counseling and Planning*, vol. 10, no. 1, pp. 25 – 37. As cited in Fox and Bartholomae, 2008.

DeVaney, Sharon A., Elizabeth E., Gorham, Janet, C. Bechman, and Virginia A. Haldeman. 1995. "Saving and Investing for Retirement: The Effect of a Financial Education Program," *Journal of the Family Economics and Resource Management Biennial*, vol. 1, pp. 153 – 158.

Downey, Tom. 2005. *The Standard & Poor's Guide to Personal Finance* (New York, NY: McGraw-Hill).

Doyle, Joseph J., Jose A. Lopez, and Marc R. Saidenberg. 1998. "How Effective Is Lifeline Banking in Assisting the 'Unbanked'?" *Current Issues in Economics and Finance* (Federal Reserve Bank of New York), vol. 4, no. 6.

Drentea, Patricia. 2000. "Age, Debt, and Anxiety," *Journal of Health and Social Behavior*, vol. 41, no. 4, pp. 437 – 450.

Dunn, Lucia and Tufan Ekici. 2006. "Credit Card Debt and Consumption: Evidence from Household-Level Data," *Working Paper 06-01*, Ohio State University, Department of Economics.

Edmiston, Kelly D. and Roger Zalneraitis. 2007. "Rising Foreclosures in the United States: A Perfect Storm," *Federal Reserve Bank of Kansas City Economic Review*, vol. 92, no. 4, pp. 115 – 145.

Elliehausen, Gregory, E. Christopher Lundquist, and Michael E. Staten. 2007. "The Impact of Credit Counseling on Subsequent Borrower Behavior," *Journal of Consumer Affairs*, vol. 41, no. 1, pp. 1 – 28.

Employee Benefit Research Institute and Mathew Greenwald & Associates, Inc. 2008. "Retirement Confidence Survey." Accessed June 30, 2009 at http://www.ebri.org/.

Evans, Kelly. 2009. "Hard-Hit Families Finally Start Saving, Aggravating Nation's Economic Woes," *Wall Street Journal*, January 6, p. A1.

Fannie Mae Foundation (1999). "Personal Finance and the Rush to Competence: Financial Literacy Education in the U.S.," Institute for Socio-Financial Studies, Middleburg, Virginia.

Federal Deposit Insurance Corporation. 2001. *Money Smart: An Adult Education Program*. CD-ROM.

Federal Reserve Bank of Dallas. 2008. "Building Wealth: A Beginner's Guide to Securing Your Financial Future," Revised and Expanded Edition.

Fox, Jonathan J. and Suzanne Batholomae. 2008. "Financial Education and Program Evaluation," in Jing Jian Xiao, Ed., *Handbook of Consumer Finance Research* (New York, NY: Springer), pp. 47 – 68.

Garman, E. Thomas., Irene E. Leech, and John E. Grable. 1996. "The Negative Impact of Employee Poor Personal Financial Behaviors on Employers," *Financial Counseling and Planning*, vol. 7, no. 1, pp. 157 – 168.

Greninger, Sue Alexander, Vickie L. Hampton, Karrol A. Kitt, and Susan Jacquet. 2000. "Retirement Planning Guidelines: A Delphi Study of Financial Planners and Educators," *Financial Services Review*, vol. 9, no. 3, pp 231 – 245.

Hall, Kevin G. 2009. "Older Workers Hang On to Jobs Longer, Often Out Of Necessity," McClatchy-Tribune News Service, August 9. Accessed September 11, 2009 at http://bulletin.aarp.org/.

Hammermesh, Daniel S. 1984. "Consumption During Retirement: The Missing Link in the Life-Cycle Hypothesis," *Review of Economics and Statistics*, vol. 66, no. 1, 1 – 7.

Hathaway, Ian and Sameer Khatiwada. 2008. "Do Financial Education Programs Work?" *Federal Reserve Bank of Cleveland Working Paper 08-03*, April.

Hilgert, Marianne A. and Jeanne M. Hogarth. 2003. "Household Financial Management: The Connection Between Knowledge and Behavior," *Federal Reserve Bulletin*, vol. 89, July.

Howard, Jack L. 2001. "Workplace Violence in Organizations: An Exploratory Study of Organizational Prevention Techniques," *Employee Responsibilities and Rights Journal*, vol. 13, no. 2, pp. 57 – 75.

Investment Company Institute. 2009. "10 Myths About 401(k)s – And the Facts," February. Accessed September 11, 2009 at http://www.ici.org/.

Jewell, Mark. 2009. "401(k) Contributions on the Rise," The Associated Press, August 11. Accessed September 14, 2009 at http://money.aol.com.

Jones, John W., Bruce N. Barge, Brian D. Steffy, Lisa M. Fay, Lisa K. Kuntz, and Lisa J. Wuebker. 1988. "Stress and Medical Malpractice: Organizational Risk Assessment and Intervention, *Journal of Applied Psychology*, vol. 73, no. 4, pp. 727 – 735.

Joo, So-hyun (1998). *Personal Financial Wellness and Worker Job Productivity*. PhD dissertation, Virginia Tech, April 15.

Joo, So-hyun and John E. Grable. 2005. "Employee Education and the Likelihood of Having a Retirement Savings Program," *Financial Counseling and Planning*, vol. 16, no. 1, pp. 37 – 49.

Jump$tart Coalition for Personal Financial Literacy (2009). "Making the Case for Financial Literacy – 2009." Accessed June 30, 2009 at http://www.cardtrak.com/.

Kim, Jinhee and E. T. Garman. 2004. "Financial Stress, Pay Satisfaction and Workplace Performance," *Compensation and Benefits Review*, vol. 36, no. 1, pp. 69 – 76.

Kotlikoff, Laurence J. 2008a. "Economics' Approach to Financial Planning," mimeo, March. Accessed May 4, 2009 at http://www.esplanner.com/.

Kotlikoff, Laurence J. 2008b. *Spend 'Til the End: The Revolutionary Guide to Raising Your Living Standard--Today and When You Retire* (New York, NY: Simon & Schuster).

Lagorio, Juan. 2009. "Credit card defaults up, delinquencies fall: Fitch," Reuters, June 4. Accessed July 28, 2009 at http://www.reuters.com.

Loibl, Cäzilia, and Tahira K. Hira. 2005. "Self-Directed Learning and Financial Satisfaction," *Financial Counseling and Planning*, vol. 16, no. 1, pp. 11 – 21.

Lusardi, Annamaria. 2004. "Savings and the Effectiveness of Financial Education, Mitchell, O. and Utkis, S. eds., in *Pension Design and Structure: New Lessons from Behavioral Finance* (Oxford. UK: Oxford University Press), pp. 157 – 184.

Lusardi, Annamaria. 2008. "Increasing the Effectiveness of Financial Education in the Workplace" Working paper 79/08, Center for Research on Pensions and Welfare Policies, Turin, Italy.

Lusardi, Annamaria, and Olivia S. Mitchell. 2007. "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth, *Journal of Monetary Economics*, vol. 54, no. 1, pp. 205 – 224.

Luther, Raminder K., E. Thomas Garman, Irene E. Leech, Larry Griffit, and Timothy Gilroy. 1997. "Scope and Impact of Personal Financial Management Difficulties of Service Members on the Department of the Navy" Military Family Institute, Marywood University, Scranton, PA.

Luther, Raminder K., E. Thomas Garman, and Irene E. Leech 1998. "The Employer Cost for the Personal Financial Management Difficulties of Workers: Evidence from the U.S. Navy," Accessed February 18, 2009 at http://www.personalfinancefoundation.org/.

Lyons, Angela, Lance Palmer, Koralalage S. U. Jayaratne, and Erik Scherpf. 2006. "Are We Making the Grade? A National Overview of Financial Education and Program Evaluation," *Journal of Consumer Affairs*, vol. 40, no. 2, pp. 208 – 235. As cited in Willis (2008).

Lynd, Robert S. and Helen M. Lynd. 1929. *Middletown: A Study in American Culture* (New York, NY: Harcourt, Brace, and World).

Maki, Dean M. 2001. "Financial Education and Private Pensions," presented at Conference on Public Policies and Private Pensions, Washington, DC, Brookings Institution, September.

Martin, Matthew. 2007. "A Literature Review on the Effectiveness of Financial Education," *Federal Reserve Bank of Richmond Research Working Paper 07-3*, June.

Meier, Stephan and Charles Sprenger. 2007. "Selection into Financial Literacy Programs: Evidence from a Field Study" *Federal Reserve Bank of Boston Public Policy Discussion Paper No. 07-5*, November.

Mills, Robert John, Harold G. Grasmick, Caroline Stout Morgan, and Deann Wenk. 1992. "The Effects of Gender, Family Satisfaction, and Economic Strain on Psychological Well-Being," *Family Relations*, vol. 41, no. 4, pp. 440 – 445.

Mortgage Bankers Association. *National Delinquency Survey*. Various Issues.

Opdyke, Jeff D. 2006. *The Wall Street Journal Complete Personal Finance Guidebook* (New York, NY: Three Rivers Press).

Papke, Leslie E. 1999. "Are 401(k) Plans Replacing Other Employer-Provided Pensions? Evidence from Panel Data," *Journal of Human Resources*, vol. 34, no. 2, pp. 346 – 368.

Perry, Vanessa G. and Marlene D. Morris. 2005. "Who Is in Control? The Role of Self-Perception, Knowledge, and Income in Explaining Consumer Financial Behavior," *Journal of Consumer Affairs*, vol. 39, no. 2, pp. 299 – 313.

Sorhaindo, Benoit. 2003. "Credit Counseling Succeeds: The Effects of Credit Counseling on Financial Stressors, Behaviors, and Well-Being," *Proceedings of Association for Financial Counseling and Planning Education*, pp. 121 – 130.

Trejos, Nancy. 2008. "More Workers Cracking Their 401(k) Nest Eggs," *The Los Angeles Times*, September 3. Accessed September 14, 2009 at http://www.latimes.com.

Walpert, Bryan, 2000. "Your Practice Tips to Detect—and Prevent—Theft in Your Practice: Divvying Up Financial Duties Among Your Office Staff Can Help Keep Embezzlement at Bay," *ACP-ASIM Observer*, American College of Physicians, November..

Willis, Lauren E. 2008. "Against Financial Literacy Education," *Iowa Law Review*, vol. 94, no. 1, pp. 197 – 285.

Figure 1
U.S. Savings Rate (percent of disposable income), 1979 – 2009

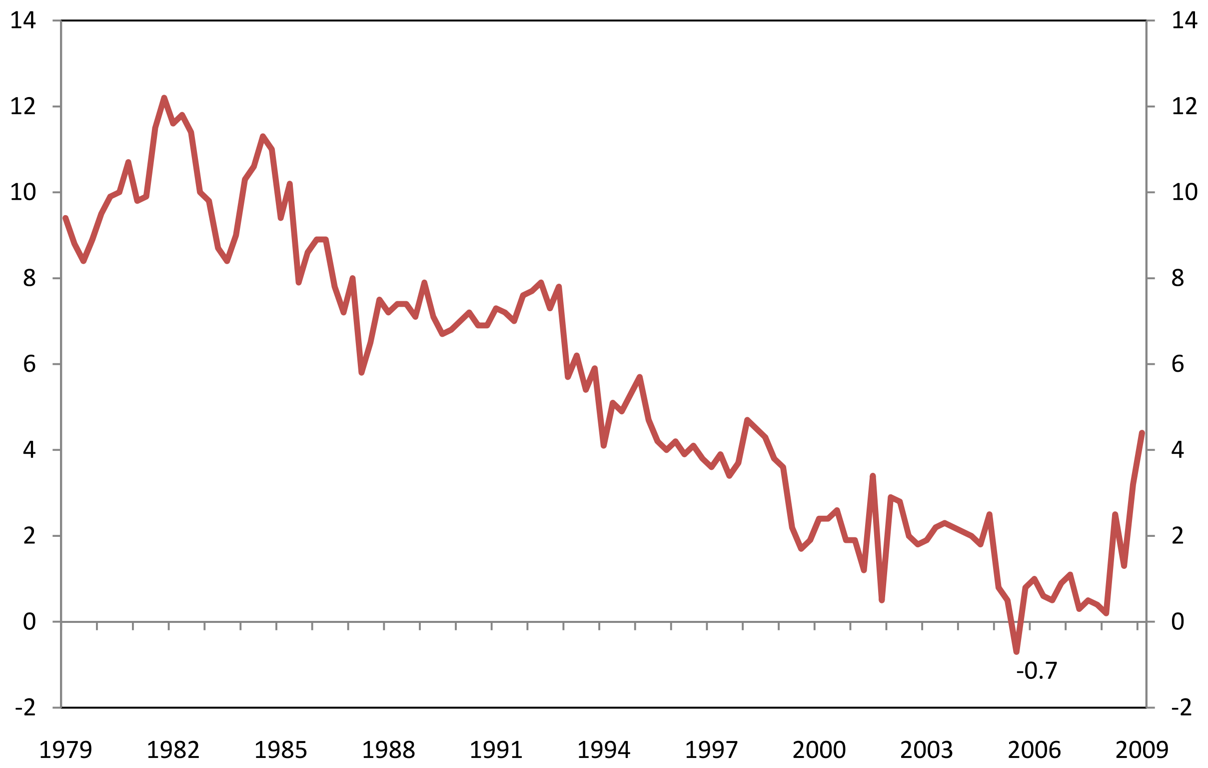
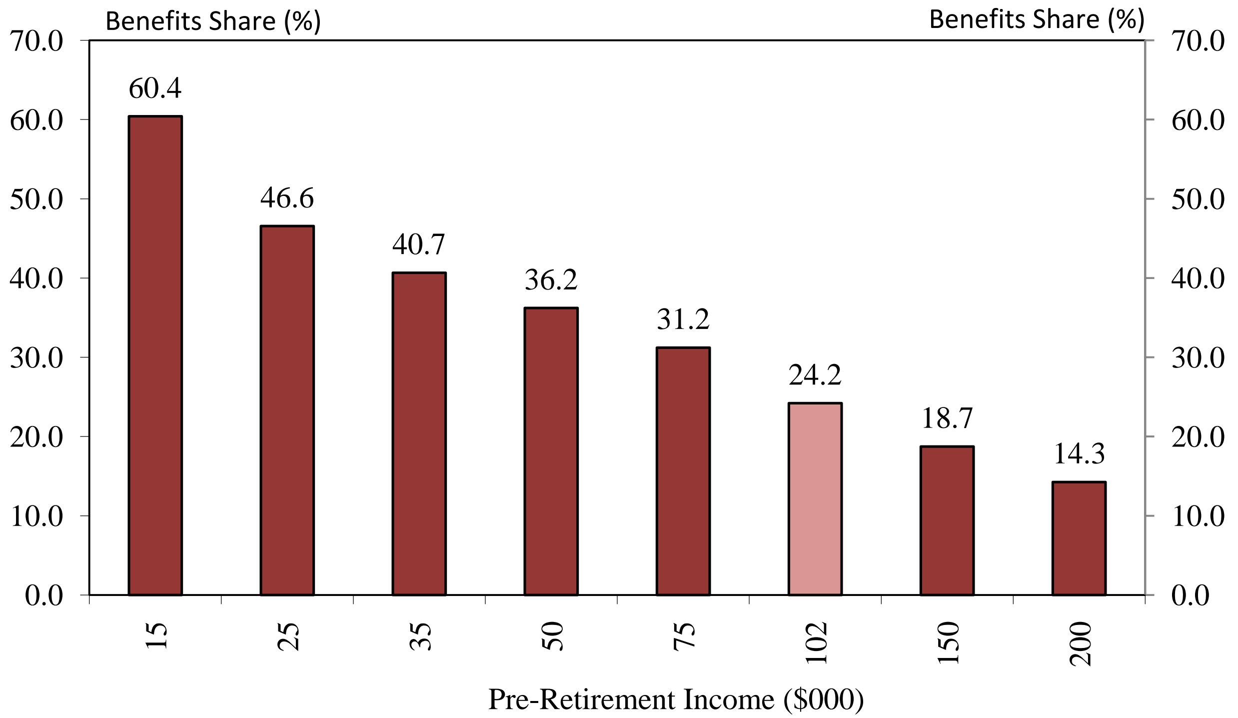


Figure 2
Social Security Benefits as a Share of Pre-Retirement Income



Source: U.S. Social Security Administration, Social Security Quick Calculator

Table 1
Cohort Comparison

Attribute	Enrolled	Not Enrolled
Age (number of years)		
Average	40.0	41.0
Gender (percent of cohort)		
Female	79.7	43.8
Race (percent of cohort)		
American Indian	1.8	0.0
Asian / Pacific Islander	1.2	2.8
Black / African-American	10.5	7.6
Other	1.8	2.8
White	84.8	86.8
Ethnicity (percent of cohort)		
Hispanic/Latino	4.9	3.5
Marital Status (percent of cohort)		
Married	58.5	65.1
Divorced	15.2	13.2
Never Married	25.7	18.9
Widowed	0.6	2.8
Income (percent of cohort)		
< $10,000	0.0	0.0
$10,000 - $14,999	0.6	0.0
$15,000 - $24,999	12.2	1.9
$25,000 - $34,999	36.6	5.6
$35,000 - $49,999	7.6	11.2
$50,000 - $74,999	32.6	28.0
$75,000 - $99,999	10.5	28.0
$100,000 - $149,999	0.0	15.9
$150,000 - $199,999	0.0	5.6
$200,000+	0.0	3.7
< $25,000	*12.8*	*1.9*
< $50,000	*57.0*	*18.7*
Education (percent of cohort)		
Less than 9th Grade	0.0	0.0
9th - 12th Grade	0.6	0.9
High School Diploma / GED	12.2	10.3
Some College (no degree)	36.6	25.2
Associate Degree	7.6	7.5
Bachelor Degree	32.6	36.5
Graduate/Professional Degree	10.5	19.6
Bachelor or Higher	*43.0*	*56.1*
Test Score (out of 9 possible points)		
Average	6.0	6.1
Has Taken Formal Financial Education Course (percent of cohort)		
Yes	21.5	36.9

APPENDIX
FINANCIAL KNOWLEDGE AND BEHAVIOR

There are a number of possible explanations for the observed financial behavior of Americans. In this appendix we argue that an important factor is knowledge (or ignorance). In particular, we stress that consumers may not realize the importance of saving for the future, and that they may not perceive the trouble they can bring upon themselves by incurring large amounts of unsecured debt. Moreover, consumers may not fully understand the implications of their financial behavior for credit worthiness or the importance of creditworthiness in achieving their financial goals. As noted by Bernheim, many Americans "lack the knowledge, training, and skill to make prudent financial decisions" (1995, p. 3). This notion is supported by our survey and interview data. The latest results from the Jump$tart Coalition for Personal Financial Literacy's biennial national financial literacy examination (2008) show that only 48.3 percent of basic personal finance questions were answered correctly by high school seniors, which was down from 52.4 percent in the 2006 examination.[1] Campbell (2006) documents that a significant number (but minority) of consumers lack an understanding of basic personal finance concepts that leads to "investment mistakes" with "serious consequences," particularly those who are poor and less educated (p. 1554).

Using data from the University of Michigan's Surveys of Consumers, Hilgert and Hogarth (2003) explore the relationship between knowledge about specific financial topics and associated financial behaviors. They find that those who scored highest on questions relating to credit management, saving, and investing were also the most likely to exhibit "good" credit management, saving, and investing habits, respectively (p. 310). Perry and Morris (2005) use data from the 1999 Freddie Mac Consumer Credit Survey to test the hypothesis that there is a

[1] "Financial Literacy Still Declining among High School Seniors, Jump$tart Coalition's 2008 Survey Shows," press release, Jump$tart Coalition for Personal Financial Literacy, April 9, 2008.

positive relationship between financial knowledge, among other factors such as income and internal *vs*. external loci of control, and "responsible financial management behavior" (p. 300).[2] Of all of the factors they considered to be indicative of responsible financial management behavior, financial knowledge was found to have the greatest effect. Chen and Volpe (1998) report that undergraduates from a variety of colleges and universities generally lack adequate financial knowledge and that those with lower levels of financial knowledge tend to "hold wrong opinions" and "make incorrect decisions" related to savings, borrowing, and investing (p. 122). There is little other research that directly investigates the link between financial behavior and financial knowledge.

To illustrate the relationships between financial knowledge and various financial behaviors in this study, several cross tabulations were produced using data from our surveys. For the analysis in this section, all pre-course surveys and control group surveys were utilized. Financial knowledge was based on a series of questions included in the survey.[3] Respondents who answered less than six of nine questions correctly (25.7 percent) were considered to have a low level of financial knowledge. Those who answered six or seven questions correctly were considered to have an intermediate level of financial knowledge (50.3 percent), and those who answered eight or nine questions correctly were considered to possess a high level of financial knowledge (24.0 percent).

Results also were compared against income. For the most part, results were similar across income strata. The exception was savings behavior. Higher income people, especially those in the upper ranges, were more likely to save and to save substantially. Knowledge was

---

[2] "Locus of control refers to the extent to which individuals believe that they can control events that affect them. Individuals with a high internal locus of control believe that events result primarily from their own behavior and actions. Those with a high external locus of control believe that powerful others, fate, or chance primarily determine events" (see http://en.wikipedia.org/wiki/Locus_of_control).

[3] The survey is available upon request of the authors.

correlated with income, however, and disentangling the separate impact on financial behavior variables is difficult in the context of this type of analysis with somewhat limited data..

Generally accepted standards of "good" financial behaviors were considered when selecting and categorizing respondents' credit card payment and usage, retirement, and emergency fund behaviors. While we recognize that optimal financial behaviors vary from individual to individual and from household to household, the analysis required us to set definite standards. For these standards, we referred to several leading personal finance guides (Opdyke, 2006; Downey, 2005; Federal Reserve Bank of Dallas, 2008; Federal Deposit Insurance Corporation, 2001). We also evaluated financial sophistication by exploring the various types of financial instruments held by the survey participants.

Financial Knowledge and Credit Card Usage

Credit cards offer consumers a number of advantages and disadvantages. The most obvious advantage is the consumer's ability to purchase items on demand without having the requisite cash required to purchase the items. When faced with "emergency" transactions like car repairs and medical care co-payments, consumers often prefer to use credit cards rather than obtain bank loans, which can be inconvenient and cumbersome for such relatively small transactions, if even available for those amounts. Moreover, Brito and Hartley (1995) show that the transaction costs of obtaining financing through loans with lower interest rates leads to the rational use of credit cards, which have low to no transaction costs for the consumer. The disadvantage of this form of financing is the high rate of interest generally charged on balances that are not paid, in full, on a monthly basis. Consumers who choose to make only minimum payments on credit card debts ultimately pay several times the purchase price per item because of interest rates that usually exceed 10 percent and in many cases reach upward of 20 percent.

Credit card debt has been shown to hinder consumption (Dunn and Ekici, 2006). In particular, a $1,000 increase in credit card debt is associated with a two percent decline in the growth rate of consumption.

With this in mind, monthly payment of credit card balances in full is considered to be a favorable financial behavior. We expect that individuals with a relatively high level of financial knowledge recognize that rolling over credit card balances from month to month results in increased interest payments and longer payoff periods. Our tabulations support this logic. Of the survey respondents with high financial knowledge, 58 percent reported paying off credit card balances on a monthly basis (Appendix Table 1), while only 40 percent of those with intermediate knowledge and 38 percent with low knowledge reported paying off their credit card balances every month.

Another factor related to responsible usage of credit cards is the amount of credit card debt carried relative to the spending limit. This ratio is important in credit scoring, can affect an individual's solvency, and reflects the amount available for rapid emergency loans. Individuals with greater financial knowledge are expected to have lower debt to limit ratios because they are presumed to be more likely to be aware of the negative consequences of carrying large balances relative to their limits. Almost half of high financial knowledge respondents had no credit card debt and therefore had a credit card debt to limit ratio equal to zero. Only 26 percent of respondents with intermediate knowledge and 17 percent of respondents with low financial knowledge had zero credit card debt. Of the respondents who reported carrying credit card balances, there was little difference in the amounts of debt carried relative to credit card limits.

Another critical measure of credit card usage is the capacity to repay debt, which we evaluate by looking at credit card debt relative to income. The large majority of survey

respondents held credit card debt less than 10 percent of their income, and there was little variation across the financial knowledge cohorts. Of those scoring in the high range on the personal finance test, 98 percent held credit card debt less than 25 percent of their income, compared to 93 percent of those scoring in the intermediate range, and 91 percent of those scoring in the low range.

These results provide some evidence that those with the greatest knowledge of personal finance more closely meet the recommendations of personal finance guides on credit card usage than those with lower levels of financial knowledge.

Financial Knowledge and Emergency Fund Status

Saving, whether for retirement or for emergencies, is an important part of good personal financial management. Personal finance industry professionals generally recommend creating and maintaining an emergency fund equivalent to three to six months of living expenses. It is also recommended that the fund consist of reasonably liquid assets that can be withdrawn in a matter of days, as most emergencies create an immediate demand for cash.

Survey respondents were asked to provide the value of all household *non-retirement* savings. From this information, an approximation of emergency fund status was created according to the following, using income as a proxy for expenses:[4]

$$\text{(A1)} \quad \frac{\text{HH non - retirement savings balance}}{\text{mid - point of annual income range/4}}$$

A value of zero indicates that the respondent does not have an emergency fund, a value below one indicates an emergency fund balance below the recommended minimum, and a value of one or higher indicates an emergency fund balance equal to or greater than the minimum level

[4] Rather than ask survey respondents for a specific income figure, we asked them to mark a range.

recommended. As expected, the advanced level of financial knowledge category contained a greater proportion of individuals with a sufficient emergency fund (12 percent) than both the intermediate financial knowledge (4 percent) and low financial knowledge (5 percent) categories. The share of survey respondents with an adequate emergency savings fund was very low overall.

The variance across the three knowledge groups is even greater when a lack of any emergency fund is considered. Only 16 percent of individuals in the advanced financial knowledge group lacked an emergency fund altogether, compared to 37 percent of those with intermediate or low financial knowledge.

Overall, the results suggest that individuals with a higher level of financial knowledge make decisions that more closely mirror experts' recommendations with regard to emergency funds than do those with a lower level of financial knowledge.

Financial Knowledge and Retirement Savings

Guidelines for retirement saving over the past few years have changed dramatically. As large companies suspend their defined-benefit pension plans, employees are forced to take an increasingly active role in saving for retirement. Defined contribution plans like the 401(k) and 403(b) are replacing pensions, and the mere presence of a defined contribution plan increases the likelihood that an employer will discontinue an existing defined-benefit plan (Papke, 1999).

Participation in a defined contribution plan requires an employee to make several major decisions. First and foremost is the decision to contribute, second is the amount to contribute, and third is the allocation of contributions across available investments. While the retirement savings structure has changed, the need to save for retirement has not. Industry professionals recommend that an individual save for retirement with an expectation of needing to replace

between 70 percent and 89 percent of current income after exiting the workforce (Greninger *et al.*, 2000).[5]

We calculated a weighted retirement savings figure as an approximate gauge of adequate saving for retirement:

$$\text{(A2)} \quad \left[\frac{\text{HH retirement savings balance}}{\text{Age - 18}}\right] \Big/ \text{mid - point of annual income range}$$

The sample was divided in thirds by weighted retirement balance and then cross referenced against financial knowledge level. Age- and income-weighted retirement savings below 2/3 of the median were considered "low," while savings above 2/3 of the median but below 4/3 of the median were considered "moderate." Age- and income-weighted retirement savings above 4/3 of the median were considered to be "high."

About 48 percent of respondents with an advanced level of financial knowledge were among the high savers, while 69 percent of those with a low level of financial knowledge were among the low savers. About 31 percent of intermediate retirement savers were in the high retirement savings cohort, while more than half were in the low savings cohort. These results suggest that individuals with higher levels of financial knowledge make more prudent retirement savings decisions, at least as defined in most personal financial management guides.

Financial Knowledge and Financial Sophistication

As a final test of the relationship between financial knowledge and behavior, we compared knowledge levels to financial products utilized by survey respondents (Appendix

[5] We find these rules of thumb problematic, as they do not take account of the variety in plans for retirement among individual savers (See Kotlikoff, 2008b). Nevertheless, a rule of thumb vetted by researchers, such as this one, provides a useful standard upon which to gauge the adequacy of retirement savings among survey participants.

Figure 1). In virtually every case, experience with the various financial instruments increased with financial knowledge, as measured by the survey test.[6]

Perhaps the most common financial product employed by consumers is a checking account. In our sample, 100 percent of survey respondents scoring "high" on the knowledge test used a checking account, compared to only 83 percent of those scoring "low" on the knowledge test. Most likely, the majority of those without a checking account are completely unbanked. The lack of a checking account is highly correlated with income (Doyle et al., 1998), which is correlated with knowledge, although to a lesser degree. While only two of our survey respondents had household income less than $15,000 per year, neither had a checking account. About 11 percent of those with incomes between $15,000 and $25,000 did not use a checking account. Virtually all of the survey respondents with incomes above $25,000 had checking accounts, although there were exceptions in most income categories.

The differences between those with low knowledge scores and those with high knowledge scores were more dramatic for more sophisticated financial products. For example, 41 percent of survey respondents with high knowledge scores invested in mutual funds, compared to only 14 percent of respondents with low knowledge scores. Roughly one-third of high knowledge respondents invested in individual stocks, compared to eight percent of low knowledge respondents. The use of most other financial products saw about the same distinctions between those scoring high *versus* those scoring low on the knowledge test.

Financial Knowledge and Previous Exposure to Financial Education

The existing literature on the relationship between financial knowledge and exposure to personal financial education is mixed. Surprisingly, students who had taken a course in personal

[6] Campbell (2006) asserts that financial innovation is slowed by the cost of educating households about new financial products.

finance did *worse* on the 2006 Jump$tart Coalition examination than did students who were not exposed to financial education (Fox and Bartholomae, 2008). A 2003 – 2004 evaluation of the National Endowment for Financial Education High School Financial Planning Program (HSFPP) showed a increased understanding of money management among participants three months after taking the course (Danes, Huddleston-Casas, and Boyce, 1999).

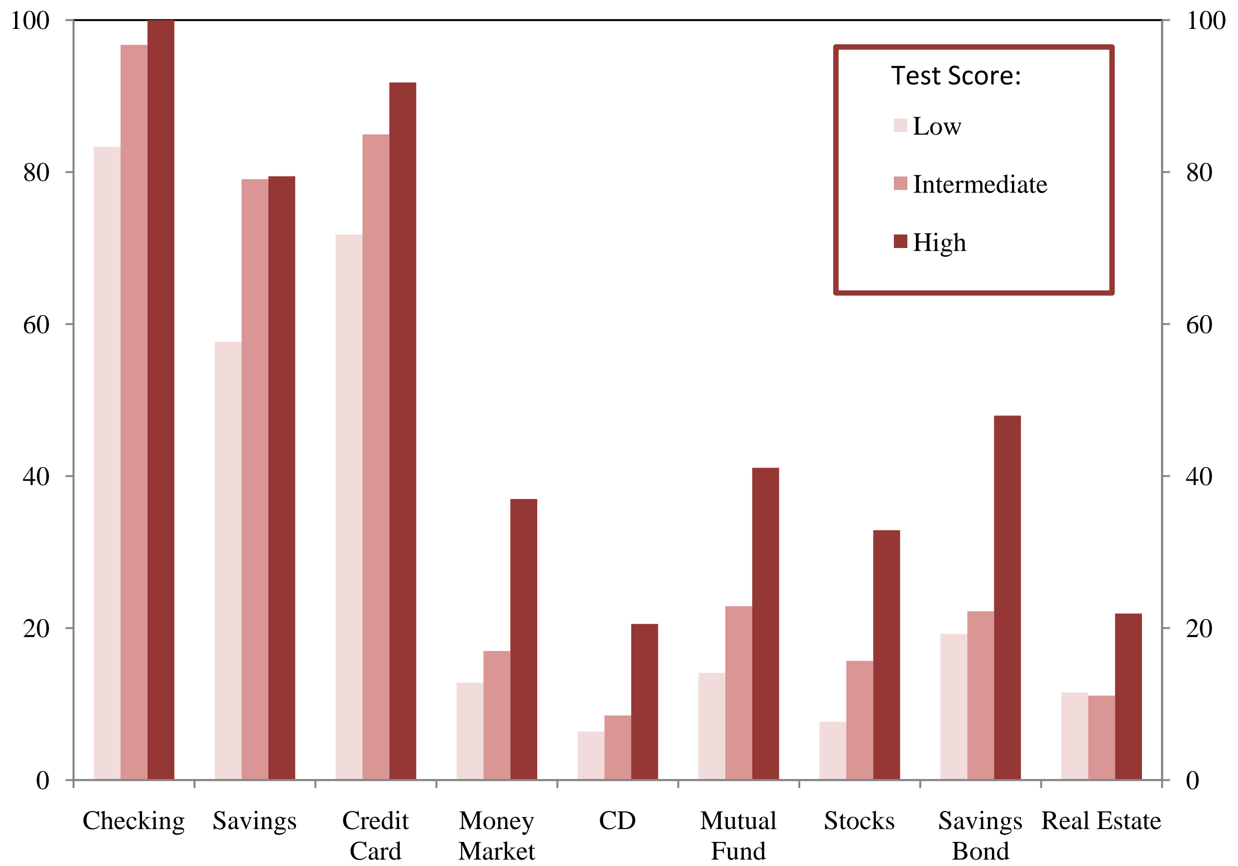
The cross tabulations relating financial knowledge level to credit card, emergency fund savings, and retirement savings behaviors all suggest that individuals with the greatest level of financial knowledge more often meet the recommendations of personal financial planners than do those with lesser amounts of financial knowledge. The studies discussed previously provide support for the idea that financial education improves personal financial behavior. It is, therefore, reasonable to assume that this occurs, at least in part, because financial education improves financial knowledge. Our findings strongly support this notion. Over one-third of respondents in our survey who had high scores on the financial knowledge test had been previously exposed to formal financial education while only 16 percent of those with low knowledge scores had been previously exposed (Appendix Figure 2). Those with high knowledge scores also were more likely to read personal finance magazines and self-help books and to seek advice from a financial counselor.

Appendix Table 1
Financial Knowledge and Financial Behavior

	TEST SCORE (out of possible 9 points)		
	Low (< 6)	Intermediate (6 – 7)	High (8 – 9)
Do you follow a monthly budget?			
Yes	28*	28	36
Do you generally pay off your credit card balances every month?			
Yes	38	40	58
Credit card balances relative to credit limits			
0%	17	26	49
0% - 10%	39	31	24
10% - 25%	8	11	8
25% - 50%	12	16	7
> 50%	24	17	13
< 10%	56	57	72
< 25%	64	68	81
Credit card balances relative to income			
< 10%	84	79	92
10% - 25%	7	14	6
25% - 50%	6	4	2
> 50%	3	3	0
< 25%	91	93	98
Emergency fund adequacy (at least three months of expenses saved outside of retirement accounts is considered sufficent for this study)			
None	37	37	16
Insufficient	58	59	71
Sufficient	5	4	12
Retirement savings relative to age and income (see formula in text)			
Low	69	52	33
Moderate	13	17	19
High	18	31	48

* All values expressed in percentage of test score cohort (e.g., those earning a low score); Here, 28 percent of those earning a low score on the knowledge test follow a monthly budget, compared to 28 percent of those scoring an intermediate score and 36 percent of those earning a high score.

Appendix Figure 1
Financial Knowledge and Financial Sophistication (share holding the financial instrument)



Appendix Figure 2
Financial Education and Financial Knowledge