

Financial Education at the Workplace

Evidence from a Survey of Federal Reserve Bank Employees[†]

Part I: Knowledge and Behavior

Kelly D. Edmiston[‡]
Senior Economist
Community Affairs Department
Federal Reserve Bank of Kansas City

and

Mary C. Gillett-Fisher
Graduate Research Assistant
Center for Housing Research
Virginia Tech

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Abstract

There are a number of possible explanations for the seemingly irresponsible financial behavior of many Americans. In this paper we argue that an important explanation is simply ignorance: consumers often make poor financial decisions because they do not know how to make good ones. 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. Using survey data from employees of the Federal Reserve Bank of Kansas City, we demonstrate that, at least for people sharing the characteristics of these employees, financial position is highly related to knowledge of personal finance. We also demonstrate a relationship between financial education and financial knowledge and behavior for this group.

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[‡] 925 Grand Boulevard, Kansas City, MO 64198-0001. Tel: (816) 881-2004. Fax: (816) 881-2389. E-Mail: kelly.edmiston@kc.frb.org

Financial Education at the Workplace

1. Introduction

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. Empirical evidence largely supports this notion.

Consider, for example, retirement savings. Although optimal consumption behavior over the life-cycle necessitates consumption smoothing,¹ numerous studies have shown that consumption tends to drop rather dramatically for many people at retirement (Hammermesh, 1984; Bernheim, 1993; Banks et al., 1998; Bernheim et al., 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 workers do not save enough to maintain optimal consumption in their retirement years. In some ways, the problem seems to have become worse in recent years.

In the early 1980s, the U.S. saving rate ranged between ten and twelve percent (Figure 1). In 2005, the latest date at which annual data are available, the U.S. savings rate dipped below zero for the first time since early in the Great Depression. Specifically, personal saving as a percentage of disposable income fell to -0.4 percent for the year for 2005, and as low as -1.6 percent in the third quarter. In the first quarter of 2006, personal saving was -0.5 percent of disposable income.

According to the Federal Reserve's 2004 Survey of Consumer Finances, less than half of families held financial assets in a retirement account in that year, and the median value of holdings in retirement accounts was only \$35,200 (Bucks *et al.*, 2006). There is no guarantee that even this small amount in the average account will be available for retirement, however, as a significant share of people cash out their 401(k)'s when they change jobs. A recent study by

¹ For an introduction to the life-cycle model of consumption and saving, see Browning and Crossley (2001).

Hewitt Associates of nearly 200,000 workers who participate in their 401(k) plans found that 45 percent elected to cash out their plans upon leaving.² 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 is not likely to provide sufficient retirement income for most people, even if their mortgages are paid off. A 65 year-old earning \$15,000 per year and retiring in 2006 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 \$100,000 would yield only 21 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 2006 Trustees Report predicts that without significant changes in the system, the Social Security trust fund will be expended by 2040 (Board of Trustees, 2006).

Americans as a whole not only are saving inadequately for retirement by most measures, but also are accumulating large amounts of debt. In 2004, roughly three-quarters of families held some kind of debt, including almost 90 percent of families with a head aged 35 – 44 (Bucks et al., 2006). About 45 percent of families held installment debt, and roughly equal numbers held credit card debt and debt secured by a primary residence.

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. The overall median value of outstanding debt for families holding debt increased 34 percent between 2001 and 2004. By comparison, median income increased by only 1.6 percent over the same period. Debt as a percentage of total assets rose from 12.1 percent to 15.0 percent, and debt payments as a share of family income rose from 12.9 percent to 14.4

² “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>

percent. In the 2001 Survey of Consumer Finances, 7.0 percent of families reported having at least one payment past due 60 days or more. By the 2004 survey, that share had reached 8.9 percent, an increase of about 27 percent. Personal bankruptcy filing rates have increased at a compound annual rate of 6.4 percent since 1980, climbing from 13 filings per thousand people in 1980 to 59 filings per thousand people in 2005 (Administrative Office of the U.S. Courts) (Figure 3).

There are a number of possible explanations for the seemingly irresponsible financial behavior of many Americans. In this paper we argue that an important explanation is simply ignorance: consumers often make poor financial decisions because they do not know how to make good ones. 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. Using survey data from employees of the Federal Reserve Bank of Kansas City, we demonstrate that, at least for people sharing the characteristics of these employees, financial position is highly related to knowledge of personal finance. We also demonstrate a relationship between financial education and financial knowledge and behavior for this group.

In the next section we review some of the existing literature on the relationship between financial knowledge and behavior and the role of financial education. We then explain the survey and present data comparing the Kansas City Fed cohort to the general U.S. population. Finally, we present results from the survey relating financial position to knowledge and knowledge to previous exposure to financial education and conclude with some next steps.

2. Concepts and Review of the Existing Literature

2.1 Financial Education, Knowledge, and Behavior

The financial literacy literature, on the whole, reflects two central themes. The first is that good financial behaviors are positively associated with higher levels of financial knowledge.

The second is that financial knowledge and behavior are positively influenced by exposure to financial education.

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.³ 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. Perry and Morris (2005) use data from the 1999 Freddie Mac Consumer Credit Survey to test the hypothesis that there is a positive relationship between financial knowledge, among other factors such as income and internal vs. external loci of control, and responsible financial behavior. Of all of the factors they considered to be indicative of responsible financial behavior, financial knowledge was found to have the greatest effect. A study by Chen and Volpe (1998) reports that undergraduates from a variety of colleges and universities generally lack adequate financial knowledge and that those with higher levels of financial knowledge tend to have "right" opinions and make "correct" decisions related to savings, borrowing, and investing. There is little other research that directly investigates the link between financial behavior and financial knowledge.

Studies that have examined the behavioral effects of financial education generally support the notion that financial instruction improves financial behavior. When offered in the workplace, financial education has been shown to increase participation in and contributions to savings plans (Bayer et al., 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, 2003). 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

³ For a similar study using the same data, see Hogarth et al. (2002).

savers, participation in a financial education course leads to an increase in both retirement and overall savings (Bernheim *et al.*, 2001).

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, 2003). 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, 2003). 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 (2003) and Bayer *et al.* (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 plan (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. Given the results of the aforementioned studies, it is relatively safe to assume that financial education does indeed positively influence financial decisions related to retirement planning.

While the number of studies relating financial education to retirement planning is quite large, a substantial amount of work examining other factors related to or affected by financial

education has also been done. 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 inter-correlated with greater financial and career satisfaction. Other studies that have examined the effects of a 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 *et al.*, 2003).

2.2 The Financial Condition of Employees and the Employer's Bottom line

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 *et al.* (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.

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.⁴

3. Survey Process and Data

3.1 Survey Description

Data for this study was collected from questionnaires administered to employees in the Kansas City and Denver offices of the Federal Reserve Bank of Kansas City. In both cities, employees had the opportunity to enroll in a personal finance course that included ten hours of instruction and one-on-one counseling with a certified financial professional to review their credit report and address specific issues. Enrollment was limited to 50 in Kansas City and 30 in

⁴ See <http://www.stress.org/job.htm>, accessed July 6, 2006.

Denver. All course participants were asked to complete a questionnaire. In both Kansas City and Denver, questionnaires were also administered to individuals who were not enrolled in the course. This format created an enrolled subset and a non-enrolled subset in both locations.

Individuals enrolled in the course were asked to complete a questionnaire prior to the first of five classroom instruction sessions (Appendix). 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 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 Bank 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.

Only 47 of the 50 who enrolled for the course in Kansas City actually attended. The survey response rate of the Kansas City attendees was 94 percent, and 96 percent of returned questionnaires were complete and included in the analysis. In Denver, 26 employees attended the course. The survey response rate of the Denver attendees was 92 percent, and 100 percent of the returned questionnaires were complete and included in the analysis.

Participants were asked to authorize the instructor to retrieve their credit scores. The instructor met with each participant individually to reveal and discuss his/her credit score. The instructor recorded the credit score on a form detailing the study identifier code formula. Participants were then given the same form, complete with their credit score, and asked to record their study identifier, placing the form in a sealed envelope upon completion. Envelopes were collected by the instructor and returned to the research study staff. Neither the course instructor nor the research staff had any means of matching an individual to their credit score. From the Kansas City enrolled group, 19 credit scores were collected. The number was slightly higher for the Denver enrolled group, from whom 21 credit scores were obtained.

The non-enrolled group completed a self-administered questionnaire that was similar to the questionnaire completed by those enrolled in the course. Questionnaires were distributed on a Monday and individuals were given from 7am to 5pm to obtain, complete, and return them. The opportunity to enter a random drawing for one of two \$25 restaurant gift certificates was offered to those who returned the questionnaire. Respondents submitted their name for the gift certificate drawing separate from their questionnaire. The response rate of the Kansas City non-enrolled group was low (35%), despite the incentive, confidentiality, and flexibility offered. A third of the returned questionnaires were incomplete and had to be excluded from analysis. The response rate of the Denver non-enrolled group was higher (53%) than in Kansas City. All of the returned questionnaires from the Denver group were complete and included in the analysis.

3.2 Characteristics of the Federal Reserve Cohort

The results discussed below reflect the composition of the survey participants specifically and cannot be appropriately generalized to the entire U.S. Having said that, we feel that the composition of the survey participants is sufficiently close to that of the general population that the results offer useful and interesting insights. In this section we highlight the similarities and differences between the survey population and the U.S. as a whole.

Surprising to some people is that Federal Reserve banks offer a wide variety of types of jobs. There are economists, financial analysts, and bank examiners, of course, but also security officers, maintenance workers, and people who process cash and checks. In Kansas City, roughly 70 percent of employees were either officers (6.7 percent) or management and professional staff. About seven percent worked in building operations or security, while the remaining 23 percent were members of the administrative and clerical staff. In Denver, over 60 percent of employees were in building operations/security or administrative/clerical classifications. The population of Federal Reserve Bank employees contains people of widely varying social, educational, family, and skill backgrounds.

Perhaps the most important demographic attribute for personal finance surveys is income. Our cohort of survey participants reported significantly higher household income levels than the

U.S. population as a whole (Figure 4). Most salient is that none of the employees taking the survey lived in households with income less than \$25,000 per year, while almost 29 percent of the U.S. population lives in such households. Higher income households also were overly represented in the survey cohort, as roughly 45 percent of survey respondents lived in households with incomes above \$75,000 per year, compared to 20 percent of the general population.

Our survey cohort also was better educated than the U.S. population as a whole. All of the survey participants had at least a high school education, for example, whereas about 16 percent of the U.S. adult population has not graduated from high school. A substantially larger share of the survey cohort was college-educated or better (49 percent) and had a graduate or professional degree (15 percent) than the U.S. population as a whole (25 percent and 8 percent).

Marital status was fairly consistent with the U.S. population. A somewhat larger share of the survey cohort was married (61.7 percent) than in the U.S. as a whole (54.4 percent). The survey cohort contained a smaller share of never married (19.5 percent vs. 29.1 percent) and a somewhat larger share of divorced people (14.8 percent vs. 9.7). A 6.6 percent share of the U.S. population is widowed, but only a negligible share of the survey cohort was widowed.

Racially, the survey over-represents whites and American Indians. Blacks make up 12.3 percent of the U.S. population, but only 5.5 percent of the survey cohort. Roughly 12.5 percent of the U.S. population is Hispanic, while less than four percent of the survey cohort was Hispanic. Asians and Pacific Islanders also are underrepresented in the survey cohort.

4. Empirical Results

4.1 Comparative Descriptive Analysis

As individuals gain financial knowledge their financial behaviors are expected to improve. To illustrate this assumption in a basic sense, several cross tabulations were produced. We considered the following relationships: financial knowledge level relative to credit card payment and usage behaviors; financial knowledge level relative to retirement savings; financial

knowledge relative to financial satisfaction; financial knowledge relative to emergency fund status; and financial knowledge relative to previous exposure to financial education.

Financial knowledge level was based on a series of questions included in the survey questionnaire (Appendix). Respondents who answered less than six of nine questions correctly (55.6 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, and those who answered eight or more questions correctly were considered to possess a high level of financial knowledge. Generally accepted standards of “good” financial behaviors were considered when selecting and categorizing respondents’ credit card payment and usage, retirement, and emergency fund behaviors for comparison. The proportions of individuals with low, intermediate, and high levels of financial knowledge varied between cross tabulations due the number of non-missing observations present for each individual variable. The cross tabulation results can be found in Tables 4 through 8.

4.1.1 Financial Knowledge Level and Credit Card Behavior

Credit cards offer consumers a number of advantages and disadvantages. In some cases what is perceived by the consumer to be an advantage may, in the context of the individual’s overall personal financial health, be problematic. The most obvious example of this is the consumer’s ability to purchase items on demand without having cash equal to the balance of the transaction on hand. When faced with “emergency” transactions like car repairs and emergency 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. 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.

With this in mind, monthly payment of credit card balance 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 respondents with advanced financial knowledge, 73.8 percent (31/42) reported paying off credit card balances on a monthly basis. While only 55.8 percent (29/52) of those with intermediate knowledge and 38.5 percent (20/52) 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, because this ratio is important in credit scoring and can affect an individual's solvency. Individuals with greater financial knowledge are expected to have lower debt to limit ratios because they are presumed to be more likely aware of the negative consequences of carrying large balances relative to their limits. The majority (66.7 percent) of high financial knowledge respondents had no credit card debt and therefore had a credit card debt to limit ratio equal to zero. Only 18.4 percent of respondents with low financial knowledge had no credit card debt. Of the respondents who reported carrying credit card balances, 11.9 percent of those with advanced financial knowledge were in the top third of (non-zero) debt to limit ratios, while 39.5 percent of those with low financial knowledge fell in the same category. The proportion of advanced financial knowledge individuals in the lower third of (non-zero) debt to limit ratios (16.7 percent) was higher than the proportion in the top third while the proportion for low level financial knowledge was lower (21.1 percent). These results suggest that those with the greatest knowledge of personal finance make better credit card usage decisions than those with lesser amounts.

4.1.2 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 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. We expect that individuals who are more financially literate are more inclined to be aware of these guidelines and are therefore more likely to maintain a reasonable emergency fund.

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:

$$(1) \quad \frac{\text{HH non - retirement savings balance}}{\text{mid - point of annual income range}/4}$$

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 indicates an emergency fund balance equal to or greater than the minimum level recommended. As expected, the advanced level of financial knowledge category contained a greater proportion of individuals with a sufficient emergency fund (31.7 percent) than both the intermediate financial knowledge (12.2 percent) and low financial knowledge (3.9 percent) categories.

The variance across the three knowledge groups is even greater when a lack of any emergency fund is considered. Only 9.8 percent of individuals in the advanced financial knowledge group lacked an emergency fund altogether, compared to 22.5 percent of those with intermediate financial knowledge and 49.0 percent of those with low financial knowledge.

Individuals may be consciously saving too little for emergencies because of their spending and consumption habits or they may not be aware of the amount of money that can be quickly drained in emergency situations like temporary lay-offs or unpaid medical absences. Overall, however, the results suggest that individuals with a higher level of financial knowledge

make decisions that more closely mirror experts' recommendations than do those with a lower level of financial knowledge.

4.1.3 *Financial Knowledge and Weighted Retirement Savings Balance*

Guidelines for retirement saving over the past few years have changed dramatically. As large companies like IBM and Sears begin suspending their pension plans, employees are forced to take an increasingly active role in saving for retirement. Defined contribution plans like the 401(k) 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 somewhere to replace between 70 percent and 89 percent of current income after exiting the workforce (Greninger *et al.*, 2000). As was the case for emergency funds, individuals who are more financially literate are expected to be more aware of retirement saving and planning guidelines and are therefore more likely to save adequately for retirement.

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

$$(2) \quad \left[\frac{\text{HH retirement savings balance}}{\text{Age} - 18} \right] / \text{mid - point of annual income range}$$

The sample was divided in thirds by weighted retirement balance and then cross referenced against financial knowledge level. Over 41 percent of respondents with an advanced level of financial knowledge were in the top third of retirement savers while 46.9 percent of those with a low level of financial knowledge were in the bottom third. Surprisingly, the proportion of individuals with intermediate financial knowledge that fell into the top third of retirement savers (43.5 percent) slightly exceeded the proportion of individuals with advanced financial knowledge

who were in the top third. However the variation in the remaining two thirds of retirement savers favored those with advanced financial knowledge. More than three fourths of those with low financial knowledge fell into the bottom two thirds of retirement savers, with almost half of all low financial knowledge individuals falling into the lowest third. These results suggest that individuals with higher levels of financial knowledge make more prudent retirement savings decisions.

4.1.4 Financial Knowledge and Previous Exposure to Financial Education

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 make better financial decisions relative to others in the sample 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 because financial education improves financial knowledge which influences, for the better, financial behavior. Our findings suggest just that. Almost half of respondents in our survey who had advanced or intermediate financial knowledge had been previously exposed to financial education while only 19.6 percent of those with low knowledge had been previously exposed.

4.2 Determinants of Financial Knowledge

The level of personal financial knowledge an individual possesses is likely to be a function of a number of different determinants beyond exposure to financial education. College major, class rank, age, gender, and amount of work experience were all factors in determining the level of financial knowledge among undergraduate students in Chen and Volpe (1998). In a more general context, individuals with less education and low incomes who are African Americans and/or Hispanic have generally been found to have lower financially literacy scores (Kotlikoff and Bernheim, 2001). Hilgert and Hogarth (2003) found financial knowledge to be greatly influenced by an individual's experience with personal financial matters. Hogarth *et al.* (2003) expanded upon Hilgert and Hogarth's (2003) findings, adding that those with the greatest

level of financial knowledge were more likely than those with lesser knowledge to give to credit to their employers for their financial learning. The authors go on to point out that this may be due to the relatively high incomes of the top knowledge group, who may have been offered greater access to financial education than those in lower income positions. While these studies have shed light on a number of influential factors, it is important to continue to examine the relationship between internal and external characteristics and an individual's financial knowledge level as means of better understanding how financial literacy can be improved in a diverse environment. A multivariate analysis allows us to control all of the relevant factors in order to isolate the effects of any one variable of interest.

4.2.1 *The Ordered Probit Model*

Certain multinomial-choice variables are inherently ordered. Greene (1997) gives the assignment of military personnel to job classifications by skill level as an example from the literature. We use the ordered probit model for a similar scenario: assignment into one of three financial knowledge level categories given certain attributes including education, income, homeownership, prior bankruptcy filings, and use of personal finance tools (i.e. Certified Financial Planners, Credit Counseling, self-help personal finance books, and financial publications).

The ordered probit model is built around the latent regression:

$$(3) \quad k^* = \beta'x + \varepsilon$$

The dependent variable k^* is unobserved, and k is the observed form of k^* , where

$$(4) \quad \begin{aligned} k &= 0 & \text{if} & \quad k^* \leq 0 \\ &= 1 & \text{if} & \quad 0 < k^* \leq \mu_1 \\ &= 2 & \text{if} & \quad \mu_1 < k^* \leq \mu_2 \\ & & & \quad \vdots \\ &= J & \text{if} & \quad \mu_{J-1} < k^* \end{aligned}$$

The μ 's are unknown parameters that are estimated with β . The vector of explanatory variables is x . In our formulation, k^* is knowledge and $J=2$, with $k=0$ representing a low level of financial knowledge, $k=1$ representing intermediate knowledge, and $k=2$ representing advanced knowledge. With the assumed standard normal distribution, the probabilities of observing y , given x are as follows:

$$\begin{aligned}
 \Pr(k=0) &= \Phi(-\beta'x) \\
 (5) \quad \Pr(k=1) &= \Phi(\mu_1 - \beta'x) - \Phi(\beta'x) \\
 \Pr(k=2) &= \Phi(\mu_2 - \beta'x) - \Phi(\mu_1 - \beta'x)
 \end{aligned}$$

4.2.2 Ordered Probit Model Results

The definitions and means of the dependent and explanatory variables included in the analysis are listed in Table 1. A number of explanatory variables were found to be significant for each of the three knowledge level rankings. The marginal effects and corresponding standard errors are reported in Table 2.

Likelihood of Low Financial Knowledge Level. Low financial knowledge was defined as answering five or fewer of the financial knowledge questions correctly (out of a total of nine). Income appears to play a substantial role in predicting an individual's financial knowledge level. Those with a household income between \$50,000 and \$74,999 were found to be 10.3 percent more likely than those with a household income between \$25,000 and \$34,999 to be ranked in the low financial knowledge level group. Those with household incomes between \$150,000 and \$199,999 were found to be 20.78 percent less likely than those in the lowest income range category (\$25,000 and \$34,999) to have a low level of financial knowledge.

As would be expected, individuals with higher levels of formal education were, on the whole, less likely to have a low level of financial knowledge. More specifically, individuals with an associate degree, a bachelor degree, and a graduate or professional degree were 8.8, 11.5, and 18.4 percent (respectively) less likely than those with only a high school diploma to be ranked in the low financial knowledge category. Exposure to topic-specific education also appeared to influence an individual's level of financial knowledge. Those who had previously participated in

a financial education course and those who regularly read financial publications like *Money* or *Kiplinger's Personal Finance* magazines were less likely to have a low level of financial knowledge.

Given that credit counselors tend to help their clients consolidate debt, understand the components of and factors considered in a credit report, and develop a budget as part of a process to repairing credit problems, it was expected that those who had received credit counseling services would be more knowledgeable of personal financial concepts. The model revealed the opposite to be true. Individuals who had used credit counseling services were 13.4 percent more likely to have a low level of financial knowledge. This may be due to the reactive nature of credit counseling services. That is, one generally seeks credit counseling when one's credit is in disrepair, which may be indicative of a lack of financial knowledge. Further, credit counseling often is oriented to address immediate problems (such as calls from collections agencies) rather than long-term financial behavior. These individuals may not be receptive to 'learning' in such a situation and are therefore may be more likely to maintain the relatively low level of financial knowledge that contributed to their initial problems with credit.

Likelihood of High Financial Knowledge Level. High financial knowledge was defined as answering eight or nine financial knowledge questions correctly. Individuals with a household income between \$50,000 and \$74,999 were found to be less likely than those with a household income between \$25,000 and \$34,999 to be ranked in the high financial knowledge category. This is consistent with their increased likelihood of possessing a low level of financial knowledge. Those with higher incomes were more likely than those in the \$25,000 and \$34,999 income range to have high financial knowledge. Possessing an associate, bachelor, or graduate/professional degree increased an individuals' likelihood of having high financial knowledge relative to those with only a high school diploma or GED. The relative likelihoods increased as education level increased. Non-traditional education was also found to play a substantial role. Individuals who had previously participated in a financial education course were found to be 10.8 percent more likely to have high financial knowledge while those who

regularly read financial publications like *Money* and *Kiplinger's Personal Finance* magazines were 13.0 percent more likely to fall into the high knowledge category. Those who had consulted a credit counselor were 10.7 percent less likely to possess high financial knowledge, which is consistent with the findings for this variable in the low financial knowledge category.

4.3 Financial Behavior and the Employer's Bottom Line

One of the major intents of our research is to examine any impact that financial education, through better financial behavior, can have on employers' bottom lines. As noted above, there are several ways that the personal financial condition of employees can affect the profitability of their employer. Given that this study examined a relatively small share of Federal Reserve Bank of Kansas City employees, we were limited in the ways we could address this issue. In general, the results were not what we had hoped for, and our conclusion is that much more work needs to be done in this area.

One significant results we did find is that employees with low levels of financial knowledge were much more likely to have wages garnished than those in intermediate and advanced knowledge categories. Specifically, four out off 44 individuals with low financial knowledge had their wages garnished compared to one in 53 and one in 42 for those with intermediate or advanced financial knowledge.

We also compared self-reported time spent at work dealing with personal financial issues and absenteeism due to personal financial problems with knowledge level, but were unable to make a significant distinction between the groups. Our hunch is that a minimal level of work-time on personal financial issues is indicative of good behavior: those who are conscientious about their personal financial position will want to check the value of their 401(k) or peak at their bank account online to keep track of assets and look for potential problems. Spending no time at all on personal financial matters or an exceptionally long time might both be indicative of poor personal financial behavior.

5. Implications and Concluding Remarks

As retirement planning continues to be redefined, financial products and services become more complex, and the average American continues to spend with little regard for financial stability, the need for increased financial literacy and awareness will remain.

Education, either traditional or continuing, appears to promote financial literacy. Individuals with greater levels of traditional educational attainment are more likely to possess greater levels of financial knowledge, which has been shown to be a determinant of responsible personal financial behavior. Additionally, individuals who have participated in courses specifically focused on personal finance are also more likely to be more financially literate. While our results suggest that the influence of traditional educational attainment is greater in magnitude than that of financial education courses, obtaining financial education is likely more feasible for most people. And, of course, on a per-hour of instruction basis, financial education is likely much more effective in terms of personal financial behavior improvement than is traditional education.

Financial education provides a means of enhancing the financial knowledge of the majority of the population with greater flexibility and convenience. In particular, personal finance courses offered by employers at the workplace give financial decision-makers the ability to learn without trying to delegate time and money out of their already hectic schedules and stressed financial resources. Through reductions in their legal liabilities, employers can also benefit from offering financial instruction. Offering personal finance courses may help to meet ERISA's 'sufficient information' requirements thereby reducing employer liability for investment losses incurred by employees' participating in employer-sponsored contribution plans. Employers may also improve their ability to pass the 401(k) nondiscrimination tests which impose penalties if the proportion of contributions made to highly compensated employees exceeded a certain threshold. Bayer et al. (1996) found that self-directed plan participation, particularly among non-highly compensated employees, can be increased with

frequent offerings of financial education seminars. Financial education also increases the likelihood that employees will contribute more to existing plans (Clark et al., 2003).

The results of this study also suggest that good retirement savings behavior is related to better financial knowledge. On the whole, the analyses used in this study support our contention that financially literate individuals demonstrate financial behaviors that are considered to be better. While the interpretation and more importantly, the generalization, of our results are constrained by the small size of our sample and differences between our survey cohort and the U.S. population as a whole, they are significant and concur with the vast majority of other studies on the subject. Therefore, the implications of our findings and those of similar works are of great importance for both individual and societal welfare.

Government and industry should both be concerned that serious economic consequences may arise if American consumers continue on their paths of over-consuming and under-saving. The magnitude of these consequences can be mitigated through the promotion of responsible consumer spending and saving patterns. This promotion can come in the form of advertisements that disclose the benefits of good personal financial habits or in the form of financial management instruction provided to financial decision makers. Employer-based financial education provides a real opportunity to reach individuals from all walks of life with varying financial situations on a large scale.

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Figures

Figure 1

Personal Saving as a Percentage of Disposable Income
1980 – 2005

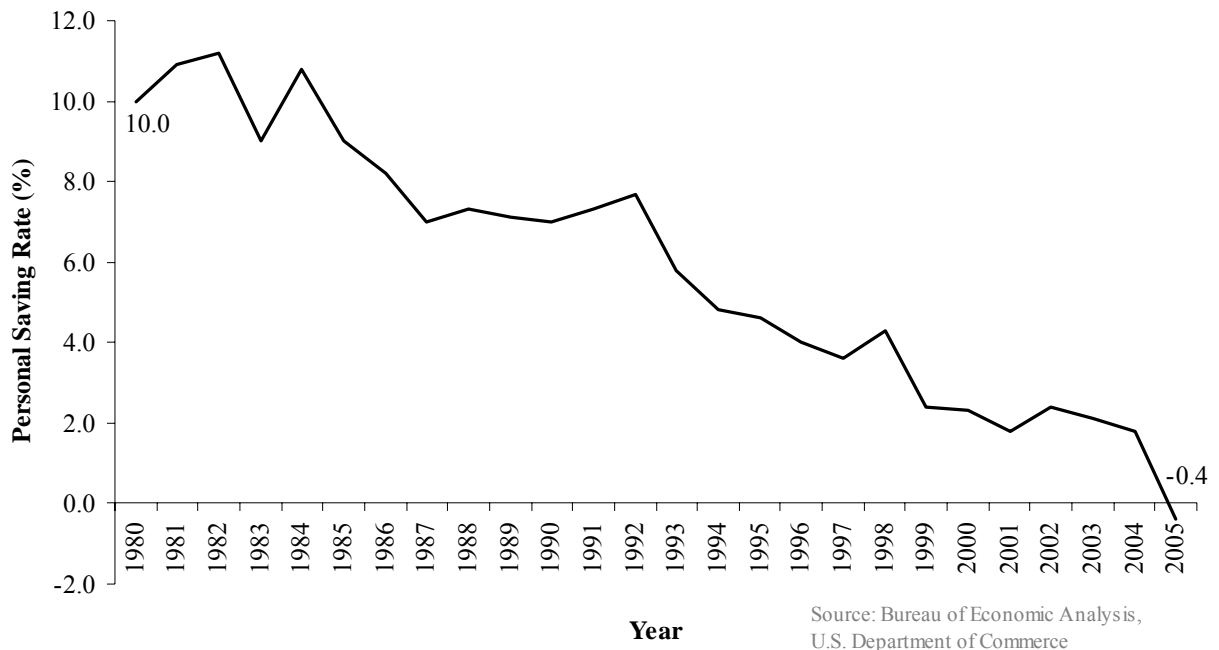
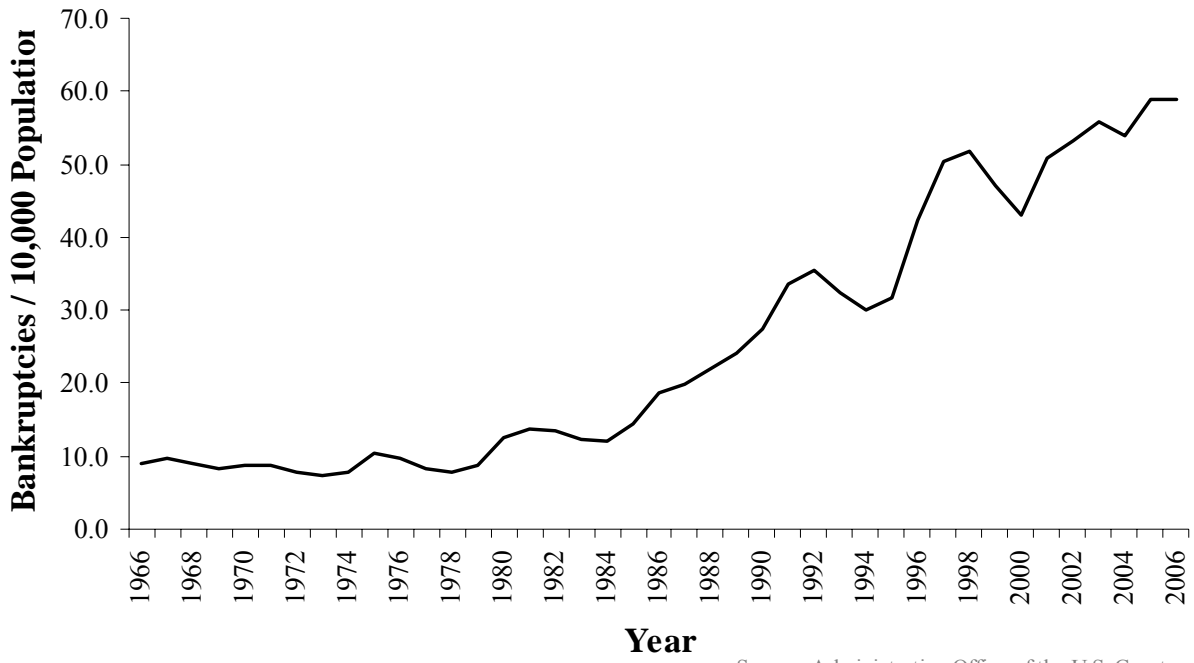
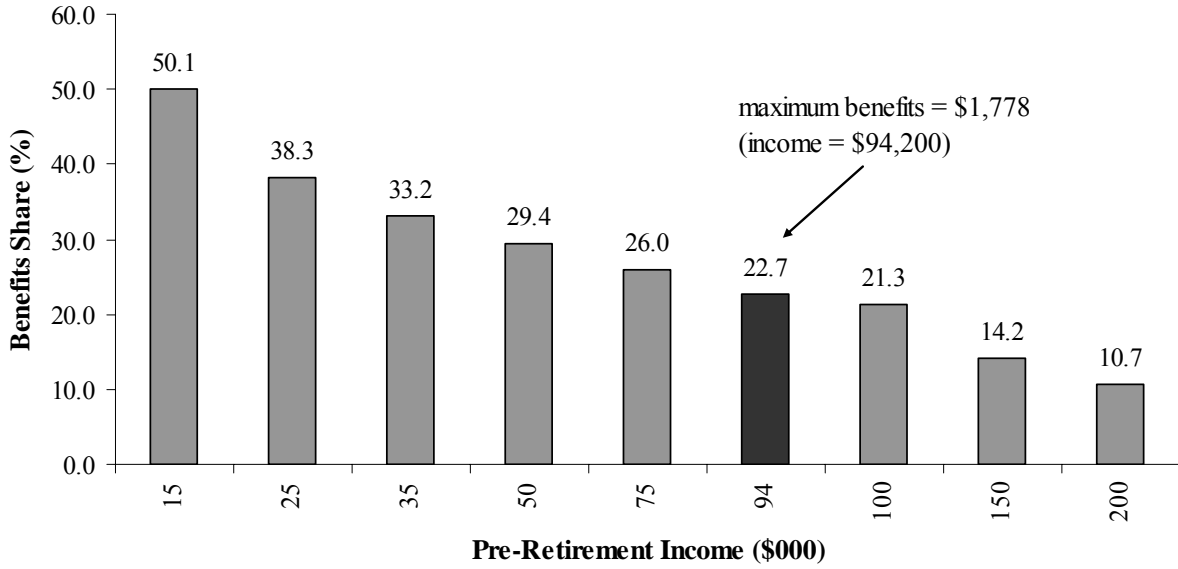


Figure 2
U.S. Bankruptcy Filing Rate, 1966 – 2006



Source: Administrative Office of the U.S. Courts

Figure 3
Estimated Share of Pre-Retirement Income Returned by OASDI
Assuming Retirement in May, 2006 at Age 65, \$2006



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

Figure 4
Income Distribution of Survey Participants Compared to the U.S.

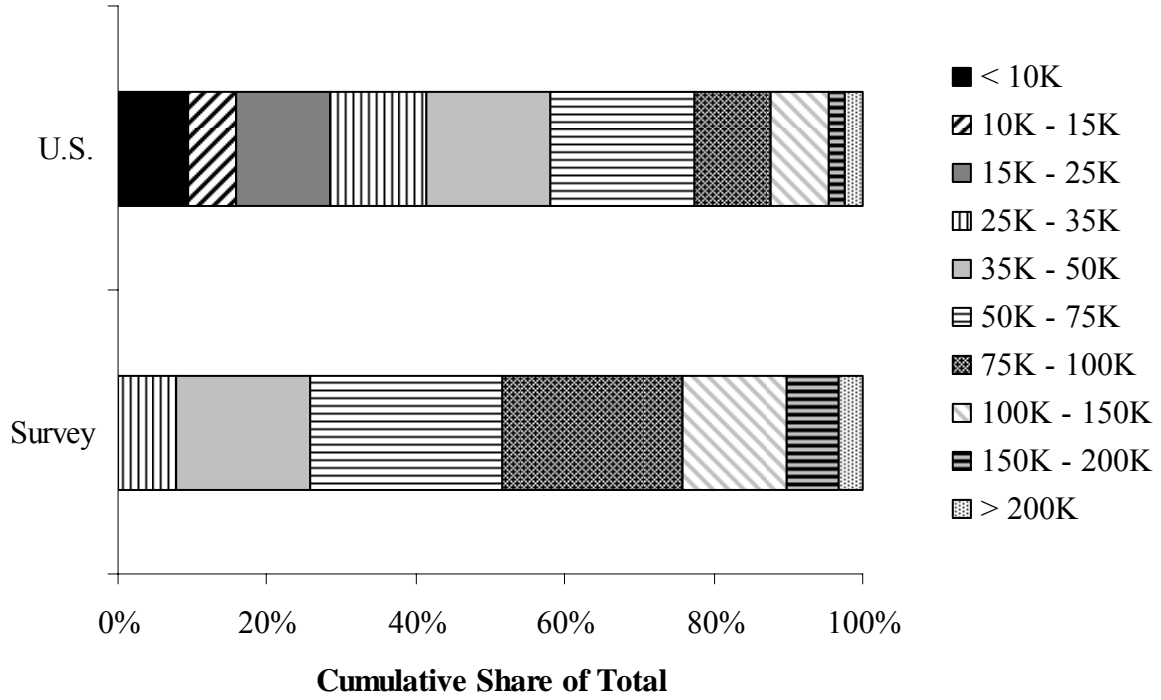
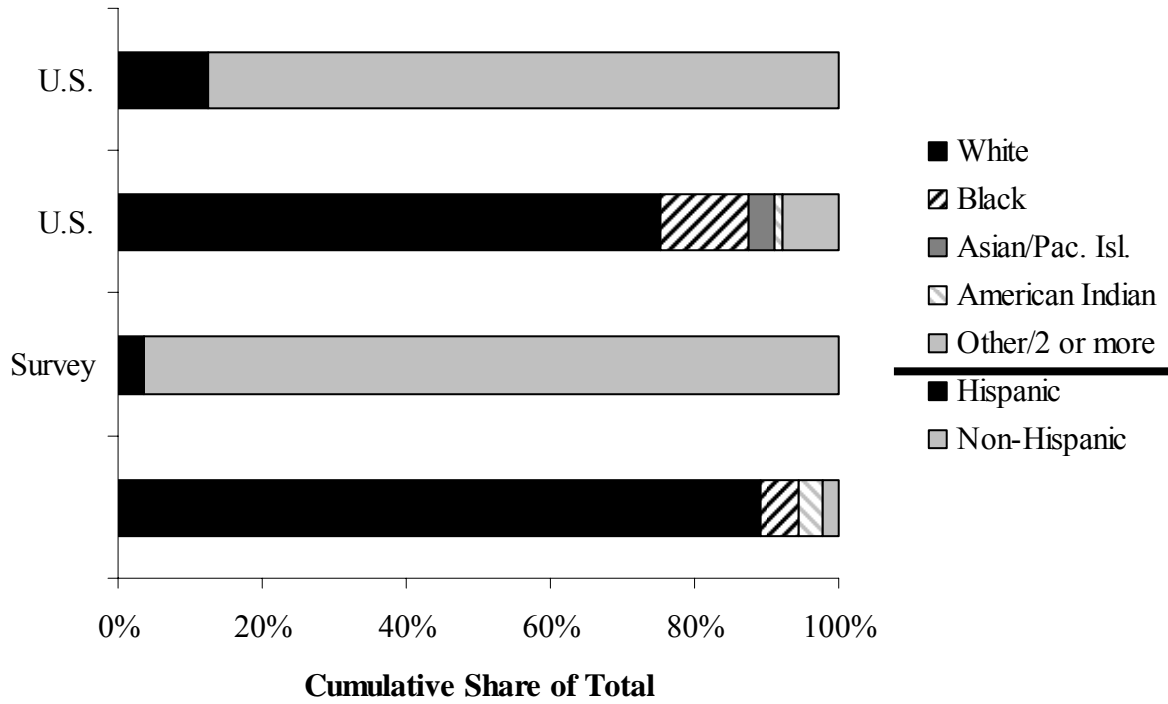


Figure 5
 Racial make-up of Survey Participants Compared to the U.S.



Tables

Table 1
Variable Definitions and Their Descriptive Statistics

Financial Knowledge Ordered Probit Model: Definitions and Descriptive Statistics for Explanatory Variables used in Model			
<i>Variable Definition</i>		Mean	Range
Dependent Variable			
KINDEXP	0=respondent had a low level of financial knowledge; 1=respondent had an intermediate level of financial knowledge; 2=respondent had an high level of financial knowledge*	.9388	0-3
Independent Variables			
INC5	1=household income (2005) of \$35,000 – \$49,999; 0=otherwise	.1727	0-1
INC6	1=household income (2005) of \$50,000 – \$74,999; 0=otherwise	.2734	0-1
INC7	1=household income (2005) of \$75,000 – \$99,999; 0=otherwise	.2302	0-1
INC8	1=household income(2005) of \$100,000 – \$149,999; 0=otherwise	.1367	0-1
INC9	1=household income (2005) of \$150,000 – \$199,999; 0=otherwise	.0647	0-1
INC10	1=household income (2005) of \$200,000 or more; 0=otherwise	.0432	0-1
EDSCOLL	1=Some College (no degree); 0=otherwise	.3381	0-1
EDASD	1=Associate Degree; 0=otherwise	.0576	0-1
EDBS	1=Bachelor Degree; 0=otherwise	.3381	0-1
EDGRPRO	1=Graduate/Professional Degree; 0=otherwise	.1655	0-1
PFINED	1=respondent had previously taken a personal financial education course; 0=otherwise	.3741	0-1
CCCS	1=respondent had received services from a credit counselor; 0=otherwise	.1007	0-1
CFP	1=respondent had used the services of a financial counselor other than a credit counselor; 0=otherwise	.1655	0-1
SELFPFM	1=respondent had read a “self-help” book related to personal financial management; 0=otherwise	.4604	0-1
FINPUB	1=respondent regularly reads financial publications; 0=otherwise	.2302	0-1
OWNHOME	1=respondent or spouse owns primary residence; 0=otherwise	.8201	0-1
BANKRPT	1=respondent or spouse has at some point declared bankruptcy; 0=otherwise	.1223	0-1
*Mean for dependent variable is misleading as values range from 0-3. Dependent variable frequencies were as follows; 0=0.352, 1=0.352, 2=0.294			
Base for income category is INC4=\$25,000 - \$34,999 (household income); INC1 and INC2 had no observations, INC3 had only one observation – INC1, INC2, and INC3 were excluded Base for education category is EDHSD=high school diploma/GED received; EDL9_12 (less than a high diploma) had only one observation and was excluded			

Table 2
Financial Knowledge Ordered Probit Model Results

Financial Knowledge Model Marginal Effects			
Variable	y=0 (low knowledge)	y=1 (intermediate knowledge)	y=2 (high knowledge)
INC5	.0483 (.0378)	-.0053*** (.0014)	-.0430 (.0414)
INC6	.1025*** (.0343)	-.0131* (.0072)	-.0894** (.0397)
INC7	-.0700 (.0456)	.0008 (.0090)	.0693* (.0397)
INC8	.0227 (.0392)	-.0020** (.0009)	-.0207 (.0411)
INC9	-.2078*** (.0592)	-.0602*** (.0132)	.2680*** (.0397)
INC10	-.0258 (.0421)	.0008 (.0045)	.0249 (.0408)
EDSCOLL	.0345 (.0381)	-.0028*** (.0009)	-.0316 (.0416)
EDASD	-.0879* (.0467)	-.0050 (.0085)	.0929** (.0405)
EDBS	-.1149** (.0494)	.0013 (.0144)	.1135*** (.0379)
EDGRPRO	-.1843*** (.0559)	-.0269* (.0163)	.2111*** (.0384)
PFINED	-.1108** (.0491)	.0029 (.0145)	.1080*** (.0378)
CCCS	.1338*** (.0349)	-.0264*** (.0078)	-.1073*** (.0417)
CFP	-.0012 (.0407)	.0001 (.0028)	.0011 (.0409)
SELPFM	-.0065 (.0411)	.0004 (.0035)	.0061 (.0407)
FINPUB	-.1247*** (.0501)	-.0048 (.0136)	.1295*** (.0387)
OWNHOME	-.0489 (.0449)	.0053 (.0105)	.0435 (.0380)
BANKRPT	-.0212 (.0419)	.0009 (.0044)	.0203 (.0407)
log likelihood function = -136.12 restricted log likelihood (slopes of all variables = 0) = -152.24 $\chi^2 = 32.24$ $df = 16$ $P[\chi^2 > \text{critical } \chi^2] = .0093$ (significant at $\alpha = 0.01$)			
<i>standard errors of marginal effects in parenthesis</i>			
*denotes significant variable with a p-value of 0.10			
**denotes significant variable with a p-value of 0.05			
***denotes significant variable with a p-value of 0.01			

Table 3
 Financial Knowledge Ordered Probit Model Results

Financial Knowledge Model Coefficients and Standard Errors		
Variable	Coefficient	Standard Error
INC5	-.1330	.3676
INC6	-.2804	.4068
INC7	.2021	.4323
INC8	-.0630	.4835
INC9	.7146	.5867
INC10	.0735	.6183
EDSCOLL	-.0960	.3154
EDASD	.2626	.4982
EDBS	.3320	.3214
EDGRPRO	.5821	.3929
PFINED	.3180	.2284
CCCS	-.3560	.3807
CFP	.0033	.2847
SELPFM	.0182	.2255
FINPUB	.3699	.2718
OWNHOME	.1345	.2979
BANKRPT	.0602	.3362
<i>Coefficients and corresponding standard errors are reported for reference. Interpretations from ordered probit model are made using marginal effects.</i>		