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The Effects of Financial Education on Short-term and Long-term Financial Behaviors

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Abstract

This study investigates how financial education in high school, college, or in the workplace affects the short- and long-term financial behaviors of adults using the 2015 National Financial Capability Study (NFCS) data. Financial education appears to have generally insignificant effects on short-term behaviors for which there is regular feedback and penalties, and thus greater opportunity for learning by doing. If consumers do not pay off their credit card bill, they get a monthly statement showing interest charges and penalties. Financial education appears to have more positive and stronger effects on long-term behaviors with less timely feedback, and for which the adverse consequences are not fully realized until later in life, so learning by doing may not work. Not saving enough money for retirement cannot be easily or quickly corrected, if at all. The benefits to financial education may differ based on the time horizon for the financial behaviors.

JEL Codes: D12, D14, I21

Key Words: Financial Education, Financial Literacy, Financial Behaviors, Time

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Financial education has the potential to help people make more informed financial decisions and change financial behaviors that can have positive effects on the financial well-being of households. Whether financial education is effective in achieving these desirable goals may depend on the time dimension. Financial education may have relatively weak or mixed effects on the *short-term* financial behaviors of people. By contrast, financial education may have a stronger and more positive influence on the *long-term* financial behaviors of people. This study focuses on the puzzling dichotomy in the apparent effectiveness of financial education on financial behaviors based on a time perspective.

Financial behaviors are defined as short-term if they involve a money or credit management task that gives regular and timely feedback to remind people about what they need to do to change their financial behavior to avoid financial penalties and consequences. The four short-term financial behaviors investigated for this study are covering your expenses and paying all your bills each month; managing your checking account so you do not overdraw it occasionally; paying off credit card balances in full each month; and, making monthly mortgage payments on time. Credit card users, for example, learn from that failure to pay off a monthly bill can lead to high interest costs and perhaps other fees, and as a result they are encouraged to make payments on time to reduce the interest costs or avoid the extra fees. This learning by doing, or correcting a financial behavior based on a timely negative feedback or experience, may

be more influential in changing behavior for managing a credit card than a financial education program that gives information about and explains the importance of regularly paying off credit card bills to reduce high interest costs.

Long-term financial behaviors involve more planning for the future and are less influenced by regular feedback or learning by doing. The four long-term behaviors studied are having a three-month emergency fund to pay for unexpected future expenses; having a savings account to save for a future purchase; owning financial investments to accumulate wealth; and, figuring out how much money is needed for retirement. They are future-oriented and involve planning, which means they are more complex to think about and more difficult to achieve than short-term money or credit management tasks. Although people can be given reminders to save or invest for the future, the feedback is usually irregular and less timely than with short-term behaviors. Perhaps more critical for long-term than short-term financial behaviors is that there is no immediate penalty or consequence if a plan for the future is not made or an action is not taken. Not paying off a credit card bill one month can be corrected with next month's payment, but not saving enough for retirement is irreversible, or cannot be quickly and easily changed when a person retires.

The basic hypothesis for this study is that financial education is more likely to have a positive influence on these long-term than short-term financial behaviors. The probable reason for the difference, as has been suggested, is related to complexity and opportunity. Short-term financial behaviors that focus on money or credit management tasks are less complex and thus can be more easily learned by doing or from experience because there is regular and immediate feedback with costly financial consequences if good practices are not followed. Long-term financial behaviors, by contrast, are more future-oriented and involve planning, which means

they are more complex tasks to initiate and are difficult to sustain over time. They also are less likely to be learned by doing or through experience because there is less regular feedback followed by immediate penalties or adverse consequences to shape the financial behavior if proper actions are not taken. These differences create more opportunity for financial education to influence or change long-term financial behaviors in positive ways.

The relative effectiveness of financial education in shaping different financial behaviors is investigated using financial data from 27,564 adults collected for the 2015 National Financial Capability Study (NFCS). The data provide estimates from a representative national sample of adults in the United States on seven major sources for financial education: high school only; college only; employer only; high school and college; high school and employer; college and employer; and, high school, college, and employer. The results indicate that financial education has an asymmetric effect on a financial behavior based on the time and task. Financial education appears to have relatively weak or mixed effects on short-term financial behaviors related to simpler financial practices for which there is regular feedback and immediate consequences for deviations. Financial education, however, appears to have significant positive effects on long-term financial behaviors that require more planning and decision-making, and for which the accountability is irregular or comes later in life.

REVEIW OF THE LITERATURE

Several studies have discussed how time or planning affect financial behaviors. Hilgert, Hogarth, and Beverly (2003) classified the financial practices of households into four categories: cash-flow management, credit management, saving, and investing. The first two are described as simpler short-term money management behaviors and the second two are more complex long-term planning behaviors. Among the households who reported doing more financial practices

related to different financial behaviors they found the largest percentage of those practices in cash-flow management (66 percent), followed by credit management (45 percent), saving (33 percent) and investing (19 percent). The authors suggest that financial behaviors may be “hierarchical” in a timing sense because participation in one is necessary before participation in another, particularly from the two money management behaviors to the long-term planning behaviors. From a financial education perspective, their results indicate that there may be more opportunities for financial education to be effective with more complex, long-term financial behaviors, such as saving and investing, where participation in financial practices are relatively lower than with basic, short-term financial behaviors, such as cash-flow management, where participation in financial practices are already high for most households.

Remund (2010) reviewed the research on different definitions of financial literacy and sorted the work into five categories: knowledge of financial concepts; ability to communicate about financial concepts; aptitude in managing personal finances; skill in financial decision-making; and, confidence to plan for a financial future. He then synthesized the categories into a recommended conceptual definition that incorporates a time factor. In his view, financial literacy measures the degree of understanding key financial concepts and also “the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, when mindful of life events and changing economic conditions” (p. 284). This definition of financial literacy distinguishes between the short-term and long-term and recognizes that financial planning is involved in long-term financial behaviors.

In an extensive review, Lusardi and Mitchell (2014) discuss the economic theory and empirical evidence related to financial literacy. Their definition of financial literacy focuses

more on long-term decisions that involve “people’s ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions” (p. 6) than on short-term concerns such as cash-flow, bill paying, or day-to-day financial matters. One likely reason for this emphasis is that they see financial literacy as a form of human capital investment that occurs over a lifetime. In this case financial education has the potential to improve that human capital, but its effectiveness in changing people’s financial behavior will depend on people’s willingness to invest and on their preferences and economic circumstances (p. 30). The investment in specific human capital can take time to produce positive returns, which suggests the payoff will be better if it is devoted to the irrevocable and consequential choices that are often long-term issues, such as noted above for retirement and wealth accumulation.

Although several studies have investigated aspects of financial education and time-related financial behavior, they have not analyzed both factors at the same time. Xiao and O’Neill (2016) used the 2012 NFCS data to measure financial capability in five ways (i.e., objective and subjective financial literacy scores, a count of twenty desired financial behaviors, a self-assessment, and an index of the four measures). They found that any financial education, or specific financial education received in high school, college, or the workplace, was positively related to their measures of financial capability. They did not, however, distinguish between long-term and short-term financial behaviors in their analysis because it was not the purpose of their study. Henager and Cude (2016), by contrast, did explore the difference in short-term and long-term financial behaviors using the 2012 NFCS data. They created index scores for short- and long-term financial behaviors using responses to a set of three survey questions for each one. Their results showed a positive association between the financial knowledge scores and index

scores for short-term and long-term financial behaviors, but the control variables in their logistic regressions did not include ones for financial education because it was not a focus of their study.

The primary goal of personal finance instruction in the school curriculum is to improve financial literacy. There is growing evidence that this instruction, when provided by well-trained teachers using good curriculum materials and valid tests, can improve the financial knowledge and financial literacy of students at different ages (e.g., Tennyson and Nguyen, 2001; Harter and Harter 2009; Walstad, Rebeck, and MacDonald 2010; Batty, Collins, and Odders-White 2015). Additional studies also show changes in the financial attitudes of students based on self-reported data collected within a short time period from when the instruction was provided (e.g., Carlin and Robinson 2012; Danes, Rodriguez, and Brewton 2013; Batty, Collins, and Odders-White 2015).

What is less known is how this precollege financial education affects the financial behaviors when high school students become adults. When this question is addressed in the research it typically targets long-term financial behaviors, such as saving or credit reputation, rather than short-term financial behaviors related to money management. In an early study of this type, Bernheim, Garrett, and Maki (2001) estimated the long-term effects from mandates for financial education in high school. The study found that the mandates increased exposure to financial education and had the effect of increasing long-term financial behaviors related to the rate of saving and wealth accumulation of adults. Later studies have investigated the link between mandated financial education in high school and other long-term financial behaviors such as one showing that young adults had higher credit scores and lower loan delinquencies in states where personal finance was mandated than young adults in other states (Brown et al. 2014).

Research on the effects of college financial education on financial behaviors has been relatively limited and often focused on short-term financial behaviors related to money and credit management because of concerns with student spending and borrowing behaviors. One campus study found mixed effects of financial knowledge on the short-term behavior of managing credit card balances: more financial knowledge was unrelated to whether students had a credit card balance, but was negatively related to whether a student carried a higher credit card balance (Robb and Sharpe 2009). Another campus study, reported that prior financial knowledge, both objective and subjective, in the first year of college might have a “minor role” in reducing the risky bill paying and borrowing behavior of the same students four years later (Xiao, et al. 2014). In one of the few comparative studies across campuses, Lyons (2008) used online survey data from ten universities and reported that taking a college personal finance course significantly reduced the likelihood of a student engaging in four risky financial behaviors with credit cards (having more than \$1,000 in debt; being delinquent on payments; reaching a credit limit; and not paying balances in full). What has been less studied, however, is the effects of financial education in college on long-term financial behaviors. One study of this type with alumni found that personal finance education delivered in a college did increase investment knowledge, but this increased knowledge did not appear to affect saving behavior (Peng, et al. 2007). Other studies, however, using the APLUS longitudinal data set found that ongoing financial education, starting in high school and continuing in college, significantly improved financial knowledge, and that cumulative financial education contributed to more responsible financial behaviors and outcomes during and after college (Shim and Serido 2011; Serido and Shim 2014).

A third major source for financial education is in the workplace. It has gained popularity in part because the switch from pensions to defined-benefit, giving employees more

responsibility for their retirement decisions. A major objective for employer-provided financial education is often to increase the financial literacy of workers so they are better prepared to handle the complex decisions involved in such long-term financial behaviors retirement planning. Research studies also suggest that financial education may be important because low levels of financial literacy may have adverse effects on retirement planning, income security in retirement, and wealth accumulation (Lusardi and Mitchell 2007; Clark, Morrill, and Allen 2012).

Some studies have investigated the effects of workplace financial education, but with a primary focus on long-term financial behaviors such as savings or retirement planning rather than short-term financial behaviors. Bernheim and Garrett (2003) evaluated the efficacy of employer-provided financial education and found that it increased saving for retirement and increased the rate of participation in retirement plans for employees and their spouses. In a related study, Bayer, Bernheim, and Scholz (2009) reported that when employers offer retirement seminars they were associated with higher rates of participation in and contribution to voluntary savings plans.

DATA SET AND DESCRIPTIVE STATISTICS

The data for the study came from the 2015 National Financial Capability Study (NFCS), which is the third and latest survey of a nationally representative sample survey of adults' financial knowledge, attitudes and behaviors in the United States. It was commissioned by the Investor Education Foundation of the Financial Industry Regulatory Authority (FINRA) and conducted with help from the U.S. Department of the Treasury, other government agencies, and the U.S. President's Advisory Council on Financial Capability. It was administered online to 27,564 adults in the United States between June and October 2015. There were approximately

500 respondents per state plus the District of Columbia with oversamples of 100 for New York, Texas, Illinois, and California. The data set includes three sampling weights, one for each level of analysis: national, regional, or state. For this study the national-level weight was used to create a representative sample of the U.S. population by age, gender, ethnicity, education, state, and census region.³

The 2015 survey contains about 140 questions and was largely developed from the previous NFCS survey that was administered in 2012, and before that in 2009. The survey begins by asking about the person's demographic characteristics including gender, age, marital status, ethnicity, living situation, income, employment, education, and number of children. After the demographic questions there are sections that ask about the following: (1) financial attitudes and behaviors; (2) financial advisors; (3) money management; (4) retirement accounts; (5) sources of income; (6) home and mortgages; (7) credit cards; (8) other debt; (9) insurance; and (10) financial self-assessment and financial literacy including questions about financial education.

Table 1 reports the descriptive statistics for the weighted 2015 NFCS data set. Almost half (49 percent) of the sample is male and almost two-thirds of the sample is white (65 percent). Each of the six age groups accounts for 12 to 18 percent of the sample. As for education, 3 percent have less than a high school education, 26 percent have a high school degree only, 31 percent have some college education, 29 percent have a college degree only, and almost 10 percent have some post graduate education. The relationship data show that 52 percent of the sample are married, 32 percent are single, 12 percent are divorced or separated, and 4 percent are widowed. About 36 percent have at least 1 child. About 20 to 26 percent of the sample have

3. Publicly available data, tables, survey questions, methodology, and preliminary reports (for the 2009, 2012 and 2015 surveys) can be found at <http://www.usfinancialcapability.org>

incomes in the first four income categories (< \$25K, \$25K-50K, \$50K-75K, \$75K-150K), with 5 percent making more than \$150,000 a year. As for employment status, 55 percent are employed (by others or self), 7 percent are unemployed, and 39 percent are not in the labor force (includes 20 percent retired).

[Table 1: NFCS Descriptive Statistics]

The 2015 NFCS survey had two questions used to construct the financial education variables. The first question (M20) asked whether financial education was offered (at a school, college, or through employment), and if so, whether the respondent participated in it.⁴ The second question (M21) asked when a respondent received the financial education (in high school, college, and workplace). Multiple categories were coded because some respondents could have received financial education from multiple sources. The seven pathways were: (1) high school only; (2) college only; (3) employer only; (4) high school and college; (5) high school and employer; (6) college and employer; and (7) high school, college, and employer. The omitted category is no financial education.

The proportion of the sample who received some type of financial education is reported in Table 1. Just over two in 10 (22 percent) respondents had received financial education whereas almost eight in 10 (78 percent) had not. Their pathways for those receiving financial education varied: 4.9 percent for high school only; 4.8 percent for college only; 2.4 percent for employer only; 2.9 percent for high school and college only; 1.7 percent for high school and employer only; 2.3 percent for college and employer only; and, 3.2 percent for all three sources.

A measure of financial literacy was constructed from the correct answers to five questions assessing knowledge about interest accrual, inflation, bond prices and interest rates,

4. To simplify the analysis, the few respondents who received financial education in the military were included with the workplace respondents because the military can be considered another employer.

mortgage pricing, and the difference between stocks and mutual funds. These five questions often have been used in research studies as a proxy for financial literacy (e.g., Hastings, Madrian, and Skimmyhorn 2013; Lusardi and Mitchell 2014; Allgood and Walstad 2016; Xiao and O’Neill 2016; Henager and Cude 2016). The score ranged from 0 to 5. The mean was 2.83 with a standard deviation of 1.48. They are similar to those reported with the 2012 NFCS data (2.96 and 1.43 in Henager and Cude 2016) and the 2009 NFCS data (2.99 and 1.44 in Allgood and Walstad 2016).

SHORT-TERM AND LONG-TERM BEHAVIORS

Four short-term financial behaviors were identified in the 2015 NFCS data set (J4; B4; F2_1; and, E15) for analysis that are similar to the basic money and credit management tasks as discussed by Hilgert, Hogarth, and Beverly (2013). The four items were recoded as dummy (yes-no) variables for the analysis to assess the following short-term behaviors: (1) not having difficulty to cover expenses or pay all bills in a typical month; (2) not occasionally overdrawing a checking account; (3) always paying off a credit card bill in full; and, (4) not being late with mortgage payments in the last twelve months. Panel A of Table 2 reports the sample size and percentage of yes responses. To simplify the later text and tables, shorter descriptions are sometimes used for the respective items: not difficult to pay bills; manages checking account; pays credit card bill in full; and, no late mortgage payments.

[Table 2: Short-term and Long-term Behaviors]

For each financial task timely feedback is given, generally on a monthly basis, indicating whether a payment was made or an account was properly managed. Nonpayment or mismanagement typically results in extra fees or penalties for financial accounts. The feedback about immediate problems is especially important for helping consumers learn how to manage

their money and credit. If consumers do not pay their bills on time, they get a reminder in the form of a past due notices and may have to pay a late fee. The mismanagement of checking accounts results in immediate feedback from a financial institution to account holders and often requires the payment of overdraft fees. A credit card statement is issued every month that gives consumers a record showing what they purchased during the month and a calculation of their outstanding balance that they need to pay in full to avoid interest charges. Homeowners who have taken out a mortgage from a financial institution to finance the house purchase have to manage their mortgage debt, a task that requires them to make a monthly payment to the financial institution. If mortgage payments are not made on time it leads to extra late fees, and consistent nonpayment can lead to foreclosure.

Hilgert, Hogarth, and Beverly (2003) suggest long-term behaviors, such as saving and investing decisions, are more complex than short-term behaviors because they are more future-oriented and require more planning. With long-term financial behaviors there also is no regular (e.g. monthly) period to complete a financial task and no immediate penalty if a financial action is not taken or a financial matter is mismanaged. Four items were selected from the 2015 NFCS survey (J5; B2; B14; and, J8) and recoded as dummy variables to measure long-term financial behaviors: (1) having an emergency or rainy day fund that would cover expenses for three months in case of sickness, job loss, economic downturn, or other emergencies; (2) having a savings account, money market account, or CDs; (3) having investments in stocks, bonds, mutual funds, or other securities that are outside of retirement accounts; and, (4) having figured out how much money is needed for retirement.⁵ Panel B of Table 2 lists the shorter item descriptions that will be used to simplify the later text and tables and reports the percentage of yes responses:

5. The survey asks non-retired individuals if they have tried to figure out how much they need for retirement while asking those who are retired if prior to retirement did they try to figure out how much they need for retirement.

emergency fund (48 percent); savings account (76 percent); non-retirement investments (33 percent); and, figured retirement (33 percent).

A brief explanation of each one may help in understanding why they are long-term rather than short-term financial behaviors. Having an emergency fund to support a household for at least three-months is a form of “cash-flow” insurance to cope with an unexpected financial expense or a sudden loss of income in the future. There is no regular feedback typically given that reminds people to create such a fund and maintain it, and no immediate penalties if they do not. The adverse consequences and the usefulness of the emergency fund are only realized when a crisis or emergency occurs, so there is limited opportunity to learn from experience to maintain such a fund.

A savings account (or alternatives such as a money market account or CDs) is usually established to accumulate money for anticipated positive and long-term purposes, such as future purchases of desired goods or services (appliances, autos, or a college education). It also can sometimes serve the dual purpose as an emergency fund for an unexpected negative event. Although opening a savings account is a one-time event, the act of opening one usually requires a decision to accumulate funds and make an initial deposit. These actions are a signal or indicator that the account owner is thinking about the future and likely planning for the long-term. Owners of saving accounts can get reminders to save and they can check their account balance anytime to see their progress in reaching a savings goal, but there is no immediate penalty or fee charged if the monthly savings is inadequate as there would be with a short-term behavior. The consequences of not saving enough to reach a financial goal is not fully realized until later when the desired purchase was to be made, but the savings are insufficient to make the purchase.

Making an investment in a financial asset outside of a retirement account is typically part of a long-term strategy to build wealth for a household. There are no adverse consequences given on a regular or monthly basis if the investment is not made or added to over time given that the action is voluntary and unrelated to employment or retirement incentives. Although some individuals may use financial advisors in making a financial investment, there is still individual involvement in the long-term planning and commitment of the financial resources. The positive or negative payoffs from making a financial investment also depend on future market conditions.

Finally, consider the decision about figuring out how much money will be needed for retirement. Making that calculation is an indicator that an individual is thinking about the future and doing long-term planning. It can be a complex and daunting task given that a household may have a portfolio of assets from retirement accounts and other sources (e.g., Social Security, other investments, or an inheritance). The task also involves comparing the anticipated funds with the desired lifestyle in retirement and making the necessary adjustments. There are, however, no current penalties if the calculation is not made as there would be for short-term behaviors. The negative effects are often only understood after it is too late to make a change or correction.

MODEL AND RESULTS

A probit model was specified for the regression analysis of each financial behavior:

$$P(Y = 1) = \Phi(\beta'x)$$

The Y variable is the financial behavior to be studied, Φ is the standard normal distribution, x is a vector of explanatory variables, and β is vector of coefficients to be estimated. Each financial behavior is coded as a 1 if the person engages in a prudent or positive financial behavior from a personal finance perspective and zero otherwise. The timely feedback for all the short-term

financial responsibilities means that there may be less need for financial education about what to do to avoid financial problems because consumers are more likely to learn by doing or from the experience of managing their monthly responsibilities. Therefore financial education may not have a large effect on these behaviors. Long-term financial behaviors are less likely to be learned through monthly experiences or regular feedback because the positive payoffs or adverse consequences may only be realized long in the future. Financial education may be more effective in changing long-term financial behaviors because there is more opportunity and time for instruction and learning to be effective than reliance on the corrective feedback of late fees and more interest charges or the threat of closed accounts.

The dependent variables (Y) for the eight probit estimations are the four short-term and four long-term financial behaviors that were previously described. In the x vector are two financial variables. The first is a financial literacy score based on the number of correct answers to the five test questions in the survey. The second, and most important for this study, are the dummy variables for financial education. They are equal to 1 if the respondent reported having received financial education in high school only, in college only, through an employer only, or in some combination of the three options. No financial education is the omitted category. Most of the variables in the x vector are the demographic characteristics (gender, ethnicity, marital status, employment, age, income, education, and if the respondent has at least one child) coded as dummy variables. Dummy variables for the U.S. state in which a respondent currently lives are used in the estimation to control for variation in responses based on location.

Short-term Results

Table 3 shows the estimated average marginal effects from the four probit regressions for the short-term behaviors. As expected across the four short-term financial behaviors the likely

effects of financial education appears to be relatively mixed in terms of statistical significance and the direction of the effects when significant (positive and negative). In the case of not having difficulty paying household bills in a typical month, none of the seven categories of financial education had a significant effect relative to not having any financial education. Turning to always paying off a credit card in full, for four financial education groups the difference with the no financial education group is insignificant, but for the three other financial education groups there is a positive relationship. As for managing a checking account without occasionally overdrawing it, five financial education groups are not statistically different from the no financial education group, but two of the coefficients are negative, suggesting that financial education is associated with a *lower* likelihood of managing a checking account without overdrawing it compared with the no financial education group. Similarly, for not being late with mortgage payments, five financial education groups showed no significant difference with the no financial education group, but two financial education groups were statistically different in a negative direction (i.e., less likely not to have a late mortgage payment).

[Table 3: Short-Term Financial Behaviors]

The relatively large number of insignificant results for the financial education coefficients (21 of 28, or 75 percent) are consistent with the working hypothesis that financial education is less likely to have a significant influence on these short-term financial behaviors for the reasons already presented. In few cases, however, the effects of financial education are significantly positive (3 or 11 percent) or negative (4 or 14 percent). The positive findings would be expected if the financial education people receive helps them better manage their financial accounts than what they learn from life experiences or regular feedback in working with their financial accounts. The negative outcomes are more surprising, but might occur if

adults who had the most trouble managing their financial accounts also sought more financial education. The cross-sectional data, however, are insufficient for identifying the specific causal effects for these few mixed findings.

What follows is a discussion of several control variables included in the probit model that show relatively consistent and significant effects across all four short-term financial behaviors. The expected and actual results for these key variables provide some support for the validity of the estimation. For example, a person's stock of financial knowledge is likely to be associated with more prudent financial behaviors because a person is likely to know about best practices to manage their personal finances. The actual results show that expected outcome. Financial literacy has a small, but positive and significant effect on each short-term financial behavior. Answering an additional question correctly results in people being two percentage points more likely to pay household bills, three percentage points more likely to manage a checking account without overdrawing it, almost one percentage point more likely to pay monthly credit card bills, and almost four percentage points more likely to not to miss mortgage payments.

Age has its expected relationship with the four short-term financial behaviors. It would be anticipated that older adults would be more experienced and careful (although the order of causality is unclear) in their money and credit management behaviors than younger adults. The differences should be especially great for adults who are 65 or more years old because they have more life experience in managing their personal finance and at the same time have more fixed or limited income so they have to be careful with their personal finances. The probit results show that in almost all cases there are significant differences in the expected direction for the oldest adults (the omitted category) across all four short-term financial behaviors compared with all

other adult age groups. Further support for this expected difference based on age is evident with the significant and positive effects for the retired variable.

Income is a significant factor related to the short-term financial behaviors as might be expected because adults with more income should have fewer cash-flow problems that may hinder their money and credit management. Compared to adults who make \$75,000 to \$150,000 those adults who have less income are 7 to 34 percentage points less likely to engage in positive practices associated with the four short-term financial behaviors. By contrast, those adults who reported making \$150,000 or more are 6 to 14 percentage points more likely to engage positively in the four short-term financial behaviors. A related income effect is children because they can be costly and create cash-flow problems from expenses for food, health and medical care, clothing, transportation, or schooling. The results show that having children makes it less likely by about seven to twelve percentage points that an adult will engage in prudent money and credit practices.

Long-Term Results

Table 4 shows the estimated average marginal effects from the probit analysis of the four long-term financial behaviors. The results show that financial education in some form or combination increases the likelihood of engaging positively each of the four long-term financial behaviors. The largest effects and ones that are consistently positive and significant across all four long-term financial behaviors are for the high school and employer combination and the high school, college, and employer combination. Adults with these financial education characteristics were 12 to 13 percentage points more likely to have a three-month emergency fund, 7 to 8 percentage points more likely to have a savings account, 13 to 14 percentage points more likely to have investments outside of retirement, and 22 to 23 percentage points more likely

to have figured out how much money they need for retirement. Other financial education groups, such as employer only, high school and college, or college and employer, also showed positive and significant percentage point increases in at least three of the long-term financial behaviors (9 for emergency fund; 3 to 8 for savings; 5 to 8 for investments; and 8 to 15 for figuring retirement). The only two financial education groups who did not show a significant influence on the four long-term financial behaviors were high school *only* and college *only*, possibly because the extent of the financial education is more limited in each case or because financial education is likely to be more effective when there is reinforcement from later instruction.

[Table 4: Long-Term Financial Behaviors]

Of major interest for this study, however, is a comparison of the effects of financial education on long-term financial behaviors as shown in Table 4 with the effects on short-term financial behaviors as shown in Table 3. From an overall perspective, exposure to financial education appears to have insignificant or mixed effects on short-term financial behaviors and generally positive and significant effects on long-term financial behaviors for the set of financial behaviors analyzed for this study. The results are consistent with the study expectation that time and task is important in assessing the effects of financial education.

In other respects, the influence of the other control variables in the probit estimation of the long-term financial behaviors is similar to those found with the short-term financial behaviors. As was the case with the short-term results, an adult's stock of financial knowledge measured by the five financial literacy questions in the survey show positive and significant effects on the four long-term financial behaviors. Answering an additional question correctly is related to a two to four percentage points increase in the likelihood of engaging in the long-term

financial behaviors. Age also makes a difference with the oldest adults showing more prudent money and credit management than the adults groups who are younger

A person's income is also a significant factor relating to the long-term financial behaviors. Compared to adults who make \$75,000 to 150,000 those adults who make less than \$25,000 are 24 to 30 percentage points less likely to engage in any of the long-term financial behaviors. Adults are 14 to 19 percentage points less likely to engage in the long-term behaviors if they make \$25,000 to 50,000 and people who make \$50,000 to 75,000 are 6 to 10 percentage points less likely to engage in the long-term behaviors. Lastly, adults who make more than \$150,000 are 6 to 12 percentage points more likely participate in long-term financial behaviors.

The largest difference in the effects of the control variables on short-term and long-term financial behaviors is with general education, with stronger effects for long-term outcomes. Adults with less than a high school degree are significantly less likely by 7 to 16 percentage points to engage in any of the long-term behaviors than college graduates. Also, adults who are high school graduates, and those adults with some college, are significantly less likely than adults who are college graduates to adopt the long-term financial behaviors, although the marginal effects are smaller. By contrast, the effects of general education on short-term financial behaviors are largely insignificant except for the results for the credit card variables.

ROBUSTNESS CHECKS

A further issue to be investigated is how robust the results are for financial education. The value of this alternative analysis is that it provides evidence on the stability of the financial education findings reported in Tables 3 and 4, regardless of some major changes made to sample

or the model. For the sake of parsimony, only the average marginal effects for the financial education variables from the probit estimation are discussed for this alternative analysis.⁶

First, it could be argued that creating seven categories for financial education based on the type received may affect the short-term and long-term analysis because of the small sample in each category. To investigate this issue, financial education was collapsed into one dummy variable reflecting *any* financial education. Even with this change, the effects of financial education on the short-term financial behaviors were again mixed: positive and significant for two variables, and negative and significant for the other two variables, with the size of the effects being relatively small (1 to 2 percentage points). By contrast, all of the effects for the long-term financial behaviors were positive, significant, and sizable (4 to 11 percentage points).

Second, an argument can be made that older adults near retirement age may be less affected by financial education because they received that education long ago in high school, college, or even through employment. When those adults ages 65 or older were removed from the sample in the probit analysis, the results for short-term behaviors and long-term behaviors were about the same as those originally reported.

Third, concern has been expressed in research reviews about the inclusion of financial literacy as a control variable in studies of financial behavior because it may be endogenous (Lusardi and Mitchell 2014, p. 27). Unfortunately, it was not possible to construct an instrument to replace this variable given the limitations of the NFCS data set, but it was possible to estimate the probit model without financial literacy. When that variable is omitted, the results for financial education show only a very slight increase on average in the marginal effects on short-term financial behaviors (0.0051) and long-term financial behaviors (0.0094). The minor differences suggest that the financial literacy variable is not necessarily a proxy for financial

6. Tables reporting the results from the robustness checks can be obtained from the corresponding author.

education and perhaps is measuring something else, such as life experience with financial matters, general cognitive ability, or some combination of factors. It also should be noted that the measure for financial literacy in the NFCS data is based on responses to only five test items that may or may not be directly associated with the financial education received. Regardless of whether a financial literacy variable is included in the estimation, financial education still has a more pronounced and sizeable effect on long-term behaviors compared to short-term behaviors.

Fourth, the sample was split into high and low groups for three important control variables to investigate whether the financial education findings still held for each group. The split comparisons were for education (high school graduate or less versus some college education or more), income (split at approximate median: less than \$50,000 versus \$50,000 or more); and financial literacy (split at the approximate mean: 0 to 2 correct versus 3 to 5 correct). The probit model was estimated for each split group and the effects of financial education on short-term and long-term financial behaviors were compared within each group. As was the case for the full sample, the split findings show few significant effects of financial education on short-term financial behaviors, but many significant effects of financial education on long-term financial behaviors.

Fifth, a check was made to see if the conclusion about the limited effects of financial education on short-term financial behavior was found with other short-term behaviors to counter the view that it was the selection of survey items that produced the results. Three survey items that were similar in money and credit management content to three of the four items used in the analysis (Table 3) were selected for comparison: (1) living within your means (J3); (2) having a checking account (B1); and, (3) not going over a credit card limit (F2_5). They were coded as dummy variables and used as dependent variables in the probit estimation. As was the case with

the original four short-term variables, the probit results for these other money and credit management variables show that financial education had minor and mixed effects on each one.

As for the long-term comparisons, few survey items were available as replacements. It was possible, however, to compare the results for the survey item on non-retirement investments with another survey item that asked respondents about having retirement investments, such as IRA accounts not connected to employment and set up by the individual (C4). The probit results for the non-retirement investments and the retirement investments were about the same. As further evidence related to the long-term financial behaviors it should be noted that an emergency fund is similar to having a savings account in that both involve saving for a future event or purpose. As would be expected, the results for those two variables are similar in Table 4.

Sixth, the short-term and long-term results do not appear to be an artifact of the year in which the survey was administered (2015). The NFCS survey was given three year earlier so that data set could be used for comparison to investigate whether the results had changed over time. The same probit analysis was conducted with the 2012 data as with the 2015 data using the same eight dependent variables.⁷ The 2012 results are quite similar to the 2015 results and also show that financial education is substantially more likely to affect the four long-term financial behaviors than the four short-term financial behaviors. In addition, the alternative analysis described in the five points above was conducted with the 2012 data and the outcomes were about the same.

SOME IMPLICATIONS

7. The financial education questions were new to the 2012 survey and therefore a comparison with the 2009 survey was not possible.

The findings from the study have some implications for the content and delivery of financial education programs. The most encouraging result is that financial education makes positive contribution to financial behaviors that are directed to longer-term outcomes. Financial topics that have a degree of complexity because they involve risk and planning for the future appear to be ones for which financial education is more beneficial. Such financial topics as establishing and maintaining an emergency fund, setting up a saving program to achieve a financial objective, making investments to build household wealth, or planning for retirement all appear to be ones that financial education is likely to influence in a positive way, in part because they require an understanding and appreciation of the rationale for taking the financial action and then further work to do the planning and make adjustments as conditions change. These long-term and more complex financial tasks may not be easily learned from experience because there is no regular feedback or adverse consequences if action is not taken. Also, if a mistake is made with a long-term financial behavior it may be too late in life to correct the problem. The general point is that financial education appears to be effective for most adults when the content and delivery focuses on long-term financial behaviors that require thoughtful planning for a financial future.

Another insight that emerges from the analysis is the apparent value of financial education over time. Financial education received only in high school or only in college appears to be limited in its effectiveness, but financial education received in high school, and then later in life in combination with financial education in college or through an employer appears to have a positive influence on long-term financial behavior. In fact, it may be these multiple exposures to financial education at different stages in life that make the greatest contribution to improving long-term financial behaviors related to protecting household finances with an emergency fund,

saving for a financial goal, investing to create income or wealth, and preparing for retirement. What this finding suggests is that financial education should be viewed as part of a life-long process that benefits people from the instruction and reinforcement they receive at different stages of life.

Of more concern is that financial education directed at short-term financial behaviors, such as paying bills on time or managing financial accounts (checking, credit card, or mortgage), appears to have minimal effects. This finding, however, should not be viewed as a criticism of financial education. Instead caution should be exercised in drawing conclusions about the effects of financial education on short-term financial behaviors because the outcomes probably depend on the life experiences of the participants and group characteristics. For most adults, learning by doing may be a reasonably good substitute for financial education related to money or credit management because if the financial accounts are not properly managed, there is regular and timely feedback about how to correct the problem and incentive to do so. Some adults, however, may be relatively inexperienced with basic money and credit management tasks or have difficulty learning by doing, in which case financial education on these tasks would likely lead to a positive outcomes. Still other adults may have on-going problems with managing money or credit even after participating in financial education, which may indicate that the effects of financial education are negative. Given the different conditions, it is worthwhile knowing more about the financial experience and background of the participants when designing, delivering, or evaluating financial education programs that focus on money or credit management behaviors.

As with any study that relies on survey data, there are limitations that qualify the implications drawn from the findings. The first one is that there is no information about what specific financial education was received by each adult in the sample. All that is known is that

an individual received or did not receive financial education in high school, college, or through the workplace. If financial education was received, it is not known whether it was through a separate course or another form of instruction. It also is not known what specific content in personal finance was taught and how long instruction was provided. We also do not know whether an individual's background or financial experiences may have affected what was gained from the financial education that was received. These unknowns suggest that it would be worthwhile to conduct future research that accounts for the content and delivery of financial education, distinguishing its effects on different classifications of financial behaviors (e.g., basic or short-term and complex or long-term), and recognizing group characteristics or experience may influence the outcomes.

Other limitations are also worth noting. One issue involves endogeneity, which could not be controlled for in the study. From this perspective, the results may have occurred because the individuals who are more likely to elect to receive financial education at any stage in life may be individuals who are more interested in it and already seek to improve their financial behavior. Although endogeneity might explain the positive effects of financial education on the long-term financial behaviors, it seems less plausible as an explanation for the largely insignificant effects of financial education on short-term financial behaviors. Another issue is that this study is based on survey data that are self-reported. Although survey respondents may state that they behave in a certain way, there is no way to check whether people actually behave in the way they responded. In addition, the survey data used for the study are from a national cross-section of adults, which means that data were only collected at a point in time and longitudinal data are not available to understand how financial behaviors may have changed.

CONCLUSION

The results from this study indicate that financial education has relatively minimal effect on short-term behaviors such as money or credit management tasks for which there is regular feedback and adverse consequences in the form of penalties and high interest charges if mistakes are made. A likely reason for this outcome is that many people who engage in short-term financial tasks learn to improve their financial situation and avoid the costly financial mistake in a process of learning by doing or through life experiences. This result suggests that financial education focusing on short-term financial behaviors should be more carefully targeted at those adults who would benefit most from it, either because they have difficulty learning by doing or because they lack substantial financial experience with money or credit management. Simply thinking, however, that most adults will significantly benefit from financial education on short-term financial behaviors is a questionable assumption that may not hold in practice.

By contrast, the results show that for most adults financial education appears to have more of an opportunity to influence or shape the long-term financial behaviors, such as saving for retirement or making investment. Such long-term financial behaviors involve more complex decision-making and require more planning for the future, which means that there is more of a chance for financial education to influence thinking and actions. Learning by doing also is less likely to be effective with long-term financial behaviors because there is no regular feedback with immediate costs to shape these behaviors. When a mistake is made with a long-term behavior it may be awhile before the mistake is fully realized and then it cannot easily be corrected. The results also suggest that financial education at different levels and in different combinations—high school, college, and employer—may be effective, but these effects appear to be greater and more significant with long-term behaviors than short-term behaviors.

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Table 1: NFCS Descriptive Statistics (n=27,567)

	Count	Mean	Std. Dev.
<i>Financial Education</i>			
High School Only	24,729	0.0486	0.2150
College Only	24,729	0.0484	0.2146
Employer Only	24,729	0.0241	0.1533
High School & College Only	24,729	0.0292	0.1684
High School & Employer Only	24,729	0.0170	0.1293
College & Employer Only	24,729	0.0233	0.1507
High School, College, & Employer	24,729	0.0322	0.1764
No Financial Education	24,729	0.7773	0.4160
Financial Literacy Score	27,564	2.8288	1.4774
Male	27,564	0.4863	0.4998
White	27,564	0.6502	0.4769
Age 18-24	27,564	0.1248	0.3305
Age 25-34	27,564	0.1805	0.3846
Age 35-44	27,564	0.1632	0.3696
Age 45-54	27,564	0.1797	0.3839
Age 55-64	27,564	0.1728	0.3781
Age 65+	27,564	0.1790	0.3834
Less than high school education	27,564	0.0258	0.1587
High school education only	27,564	0.2648	0.4413
Some college education only	27,564	0.3130	0.4637
College education (associates or bachelors)	27,564	0.2921	0.4547
Post graduate education	27,564	0.1043	0.3056
Married	27,564	0.5202	0.4996
Single	27,564	0.3173	0.4655
Divorced/Separated	27,564	0.1197	0.3246
Widowed/Widower	27,564	0.0428	0.2024
Has Children	27,564	0.3608	0.4803
Less than \$25k income	27,564	0.2460	0.4307
\$25-50k income	27,564	0.2630	0.4403
\$50-75k income	27,564	0.1992	0.3994
\$75-150k income	27,564	0.2391	0.4266
\$150k+ income	27,564	0.0526	0.2233
Self Employed	27,564	0.0712	0.2572
Employed	27,564	0.4745	0.4994
Not in Labor Force	27,564	0.1899	0.3923
Unemployed	27,564	0.0653	0.2471
Retired	27,564	0.1990	0.3992

Table 2: Short-term and Long-term Financial Behavior

Panel A: Short-term	Count	Prop.
Not Difficult to Pay Bills	26,996	0.4868
Manages Checking Account	25,139	0.8188
Pays Credit Card Bill in Full	21,473	0.5327
No Late Mortgage Payment	9,862	0.8390
Observations	27,505	
Panel B: Long-term		
Has Emergency fund	26,434	0.4813
Has Savings Account	27,083	0.7643
Has Non-Retirement Investments	25,137	0.3336
Figured Retirement Amount	26,189	0.3322
Observations	27,564	

Table 3: Probit Marginal Effects for Short-Term Financial Behaviors

	Not Difficult to Pay Bills	Manages Checking Account	Pays Credit Card Bill in Full	No Late Mortgage Payment
<i>Financial Education</i>				
High School Only	0.0005 (0.017)	-0.0071 (0.015)	0.0079 (0.021)	0.0376 (0.020)
College Only	0.0126 (0.016)	-0.0044 (0.014)	-0.0285 (0.018)	-0.0260 (0.022)
Employer Only	0.0399 (0.022)	-0.0272 (0.021)	-0.0155 (0.024)	-0.0200 (0.026)
High School & College Only	0.0169 (0.019)	-0.0045 (0.017)	0.0524* (0.022)	0.0035 (0.023)
High School & Employer Only	0.0299 (0.027)	-0.0809** (0.025)	0.1021** (0.029)	-0.0859** (0.033)
College & Employer Only	0.0155 (0.023)	-0.0316 (0.021)	-0.0198 (0.024)	-0.0032 (0.025)
High School, College, & Employer	0.0353 (0.019)	-0.0518** (0.018)	0.0560** (0.022)	-0.0610* (0.024)
Financial Literacy Score	0.0214** (0.003)	0.0275** (0.002)	0.0074* (0.003)	0.0370** (0.003)
Male	0.0383** (0.007)	-0.0094 (0.006)	0.0710** (0.008)	-0.0191* (0.009)
White	0.0002 (0.008)	0.0435** (0.008)	0.0294** (0.010)	0.0341** (0.011)
Single	-0.0064 (0.010)	0.0327** (0.008)	-0.0039 (0.012)	0.0188 (0.013)
Divorced/Separated	-0.0320** (0.012)	0.0022 (0.010)	-0.0774** (0.014)	0.0152 (0.015)
Widowed/Widower	0.0067 (0.017)	-0.0092 (0.018)	0.0409* (0.021)	-0.0235 (0.034)
Self Employed	-0.0168 (0.014)	-0.0013 (0.012)	0.0102 (0.016)	-0.0491** (0.018)
Not in Labor Force	0.0144 (0.010)	0.0154 (0.008)	0.0022 (0.013)	0.0452** (0.011)
Unemployed	-0.0980** (0.017)	0.0114 (0.014)	0.0255 (0.022)	-0.0458 (0.027)
Retired	0.0807** (0.013)	0.0305** (0.011)	0.0737** (0.014)	0.0694** (0.016)
Has Children	-0.1293** (0.008)	-0.0888** (0.008)	-0.0666** (0.010)	-0.0893** (0.010)
Age 18-24	-0.0745** (0.018)	-0.1304** (0.020)	0.1184** (0.021)	-0.2732** (0.045)
Age 25-34	-0.0758** (0.016)	-0.1327** (0.018)	-0.0310 (0.018)	-0.1635** (0.031)
Age 35-44	-0.0729** (0.016)	-0.1120** (0.018)	-0.1288** (0.018)	-0.1052** (0.031)

	(0.015)	(0.017)	(0.018)	(0.027)
Age 45-54	-0.0924**	-0.0752**	-0.1570**	-0.0945**
	(0.014)	(0.015)	(0.017)	(0.026)
Age 55-64	-0.0684**	-0.0484**	-0.0730**	-0.0619*
	(0.012)	(0.013)	(0.014)	(0.025)
Less than \$25k income	-0.3658**	-0.0818**	-0.1437**	-0.1546**
	(0.010)	(0.012)	(0.015)	(0.025)
\$25-50k income	-0.2488**	-0.0627**	-0.1324**	-0.0962**
	(0.009)	(0.010)	(0.012)	(0.015)
\$50-75k income	-0.1141**	-0.0300**	-0.0645**	-0.0594**
	(0.009)	(0.009)	(0.011)	(0.012)
\$150k+ income	0.1246**	0.0584**	0.0709**	0.0701**
	(0.017)	(0.012)	(0.017)	(0.014)
Less than high school education	-0.0108	-0.0338	-0.1090**	-0.0361
	(0.026)	(0.024)	(0.035)	(0.044)
High school education only	-0.0043	0.0061	-0.0630**	-0.0048
	(0.010)	(0.009)	(0.012)	(0.013)
Some college education	-0.0114	-0.0085	-0.0808**	0.0041
	(0.009)	(0.008)	(0.010)	(0.011)
Post graduate education	0.0169	-0.0267**	0.0647**	0.0178
	(0.011)	(0.010)	(0.012)	(0.012)
State Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	.1381	.0767	.0693	.1754
Observations	24,346	22,686	19,547	8,981

Standard errors in parentheses

* $p < .05$, ** $p < .01$

Table 4: Probit Marginal Effects for Long-term Financial Behaviors

	Emergency Fund	Savings Account	Non-retirement Investments	Figured Retirement
<i>Financial Education</i>				
High School Only	0.0100 (0.017)	0.0167 (0.013)	0.0323 (0.018)	0.0300 (0.017)
College Only	0.0103 (0.016)	0.0095 (0.013)	0.0256 (0.015)	-0.0091 (0.015)
Employer Only	0.0411 (0.022)	0.0656** (0.018)	0.0725** (0.022)	0.1539** (0.022)
High School & College Only	0.0335 (0.020)	0.0747** (0.015)	0.0447* (0.019)	0.0813** (0.019)
High School & Employer Only	0.1300** (0.028)	0.0653** (0.021)	0.1248** (0.028)	0.2235** (0.027)
College & Employer Only	0.0929** (0.023)	0.0334 (0.020)	0.0841** (0.021)	0.1455** (0.023)
High School, College, & Employer	0.1165** (0.019)	0.0721** (0.016)	0.1400** (0.019)	0.2277** (0.019)
Financial Literacy Score	0.0289** (0.003)	0.0220** (0.002)	0.0369** (0.003)	0.0441** (0.003)
Male	0.0298** (0.007)	-0.0154* (0.006)	0.0400** (0.007)	0.0152* (0.007)
White	0.0086 (0.009)	-0.0002 (0.007)	0.0238** (0.008)	0.0024 (0.008)
Single	-0.0025 (0.010)	-0.0325** (0.009)	0.0084 (0.010)	-0.0359** (0.010)
Divorced/Separated	-0.0816** (0.012)	-0.0512** (0.010)	-0.0435** (0.011)	-0.0394** (0.011)
Widowed/Widower	-0.0069 (0.017)	-0.0356* (0.016)	0.0312 (0.018)	0.0042 (0.017)
Self Employed	0.0300* (0.014)	-0.0362** (0.013)	0.0713** (0.014)	0.0039 (0.013)
Not in Labor Force	-0.0412** (0.010)	-0.0724** (0.009)	-0.0529** (0.010)	-0.0948** (0.010)
Unemployed	-0.0786** (0.016)	-0.1357** (0.014)	-0.0601** (0.017)	-0.0765** (0.016)
Retired	0.0611** (0.013)	-0.0252* (0.012)	0.0328** (0.012)	0.0157 (0.012)
Has Children	-0.0415** (0.009)	-0.0289** (0.007)	0.0305** (0.008)	0.0340** (0.008)
Age 18-24	-0.0472** (0.018)	-0.0057 (0.016)	-0.0441* (0.017)	-0.0489** (0.018)
Age 25-34	-0.1038** (0.016)	-0.0312* (0.015)	-0.0763** (0.014)	-0.0212 (0.015)
Age 35-44	-0.1562**	-0.0602**	-0.1198**	-0.0512**

	(0.015)	(0.015)	(0.013)	(0.015)
Age 45-54	-0.1558**	-0.0660**	-0.1048**	-0.0365**
	(0.014)	(0.014)	(0.012)	(0.014)
Age 55-64	-0.0915**	-0.0489**	-0.0685**	0.0091
	(0.012)	(0.012)	(0.011)	(0.012)
Less than \$25k income	-0.3190**	-0.2936**	-0.2671**	-0.2427**
	(0.011)	(0.013)	(0.009)	(0.011)
\$25-50k income	-0.1920**	-0.1487**	-0.1872**	-0.1440**
	(0.010)	(0.010)	(0.008)	(0.009)
\$50-75k income	-0.0964**	-0.0569**	-0.0924**	-0.0842**
	(0.010)	(0.010)	(0.008)	(0.009)
\$150k+ income	0.1078**	0.0249	0.1245**	0.0513**
	(0.017)	(0.016)	(0.016)	(0.016)
Less than high school education	-0.1005**	-0.1618**	-0.1304**	-0.0713**
	(0.025)	(0.023)	(0.025)	(0.025)
High school education only	-0.0461**	-0.0598**	-0.0659**	-0.0616**
	(0.010)	(0.009)	(0.009)	(0.010)
Some college education	-0.0542**	-0.0224**	-0.0461**	-0.0244**
	(0.009)	(0.008)	(0.008)	(0.009)
Post graduate education	0.0209	0.0130	0.0411**	0.0325**
	(0.011)	(0.011)	(0.010)	(0.011)
State Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	.1369	.1607	.1710	.1365
Observations	23,936	24,400	22,768	24,729

Standard errors in parentheses

* $p < .05$, ** $p < .01$