

Does financial education in high school affect retirement savings in adulthood?

Abstract

Since individuals are increasingly required to manage their own retirement portfolios, policy levers that increase retirement planning and saving have become increasingly important. We use variation in timing and presence of state-required personal finance coursework in high schools to estimate the effect of the financial education coursework on the likelihood of holding and amount in retirement accounts in adulthood (ages 25–40). Our results show no definitive increases in account ownership, non-retirement investment accounts, or homeownership. Since prior work finds required high school financial education improves credit and debt outcomes, we recommend that states and educators prioritize content that is more immediately relevant for 18-year-olds, such as budgeting, long-term debt, and credit.

Melody Harvey

University of
Wisconsin–Madison

Carly Urban

Montana State
University and IZA

1. Introduction

The burden of planning and saving for retirement in the U.S. has shifted from largely being employer- and government-sponsored through a mix of Social Security and pensions to individuals' own responsibility. Even though the responsibility has shifted to individuals, research suggests that financial literacy levels, particularly among the young, are extremely low (Lusardi et al. 2010). Individuals with higher levels of financial literacy are more likely to participate in the stock market (van Rooij et al. 2011a), plan for retirement (Alessie et al. 2011; Lusardi and Mitchell 2007; van Rooij et al. 2011b; van Rooij et al. 2012), and possess the financial sophistication that leads to higher interest in savings account (Deuflard 2019; Lusardi et al. 2017). Since starting to save for retirement earlier has the potential to generate long-term gains, this begs the question: can financial literacy education during formative teenage years increase long-run retirement savings?¹

Research has documented that workplace financial education increases the likelihood and amount of retirement savings (e.g., Collins and Urban 2016; Duflo and Saez 2003; Kaiser et al. 2021).² However, those workplace interventions happen once individuals are employed and are further into the lifecycle, and no previous research considers how required financial education in high school affects retirement planning.³ For younger adults, it is not clear that financial education will affect their long-run retirement savings, as they have conflicting priorities. A lifecycle model would predict that young adults should borrow to invest in their human capital and increase lifetime earnings. Young adults face many imminent financial challenges, such as borrowing for long-term expenses (e.g., higher education or an auto purchase), learning how to navigate the credit market, and managing a budget for the first time. If financial education covers retirement savings before addressing the basics, young people may end up saving early but then having to borrow when a shock arises.

Previous work shows that state-mandated financial education reduces non-student debt (Brown et al. 2016), improves credit scores (Brown et al. 2016; Urban et al. 2020), reduces delinquency (Brown et al. 2016; Urban et al. 2020), reduces alternative financial service use (Harvey 2019), improves postsecondary financing behavior (Stoddard and Urban 2020), increases liquid savings among those who never continue on to college (Harvey 2020), and improves student loan repayment for

first-generation students (Mangrum 2021). Thus, financial education may reduce the likelihood young adults get into financial trouble. This could then allow them to start retirement planning early, instead of being burdened with high-interest debt that necessitates immediate attention.

Required financial education in high school could also increase financial literacy, which then could result in additional downstream retirement savings. While research suggests that required financial education in high school improves outcomes related to debt and credit, there is no evidence that it improves financial literacy in adulthood (Burke et al. 2020; Mangrum 2021).⁴ If financial education during teenage years does not affect measured financial literacy, it is not clear that the literature suggesting a link between financial literacy and retirement planning remains relevant (Alessie et al. 2011; Lusardi and Mitchell 2007; van Rooij et al. 2011b; van Rooij et al. 2012). However, required financial education in high school could directly affect behaviors but does not affect measured financial literacy. This is consistent with findings in an experimental setting by Horn et al. (2020), as well as a financial education experiment that shows financial education improved inter-temporal decision-making among middle school students in Germany (Lührmann et al. 2018).

In this paper, we empirically test whether required high school financial education improves retirement savings for adults ages 25–40. Using variation in the timing and presence of state policies that require students to

1 Related work shows that math ability early in life is associated with owning risky financial assets and desire to take financial risk after age 50 (Christelis et al. 2020).

2 Collins and Urban (2016) conducted a randomized controlled trial for bank tellers; Duflo and Saez (2003) organized a benefits fair financial education experiment; and Kaiser et al. (2021) performed a meta-analysis on financial education.

3 While Lusardi and Mitchell (2017), Cole et al. (2016), and Bernheim et al. (2001) look at the long-run effects of high school financial literacy mandates on retirement and other savings, the policies they study do not include graduation requirements. Only one state (Illinois) had a graduation requirement that existed before 1980. Thus, the policies they study are inherently different. Further, Lusardi and Mitchell (2017) do not appear to use state-level fixed effects in their instrumental variables approach and Bernheim et al. (2001) do not use state-level fixed effects in their two-way fixed effects difference-in-difference estimates. Cole et al. (2016) include state fixed effects and estimate a precise null effect. This makes sense, as the “mandates” at most suggest schools should at some point mention something related to personal finance, with no instruction as to what or how much. Now, standards are much clearer and are paired with graduation requirements.

4 While not specifically studying mandates in the U.S., an international literature studying the causal effects of school-based financial education on knowledge and behaviors using randomized controlled trials shows that knowledge improves (Bruhn et al. 2016; Frisnacho 2018; Lührmann et al. 2018).

complete personal finance instruction prior to high school graduation, we estimate a two-way fixed effects (TWFE) difference-in-difference model to see if the education improves the likelihood of having a retirement account. Since the new econometric literature on TWFE shows that comparing always-treated units to newly-treated units is problematic (e.g., Baker et al. 2021; Goodman-Bacon 2021), we are fortunate that nearly all of our variation comes from the difference between never-treated and newly-treated states. We additionally estimate event study specifications to confirm no clear evidence of a non-parallel pre-trend prior to the start of the policy.

We use nationally representative data from the National Financial Capability Study's (NFCS) 2012, 2015, and 2018 waves, as well as the Survey of Income and Program Participation (SIPP). We consider how the financial education affects the likelihood of having a retirement account through an employer (e.g., a 401k), having a retirement account on their own (e.g., an IRA), and the likelihood of having other assets (e.g., a non-retirement investment account, owning a home). When using the NFCS, we additionally consider outcomes that capture financial stress, financial hardship, and financial planning related to retirement savings. When using the SIPP, we additionally consider the specific amounts in retirement savings, as well as home equity and net worth.

Overall, we find that required financial education in high school has limited effects on downstream retirement accounts in the NFCS data. We find no evidence that the education improves the likelihood of having a retirement account, having a non-retirement savings account, or owning a home. We further see no clear evidence that financial education decreases stress around retirement savings, increases the likelihood of planning for retirement, or reduces the likelihood of borrowing from one's retirement account. These results do not change much if we consider the important link between employment and retirement account ownership for the overall population.

In the SIPP—where, again, the survey over-samples low-income individuals—our results largely confirm the findings in from the NFCS: a lack of increase in account ownership or homeownership. We find some weak evidence that required financial education in high school increases the likelihood of having a retirement account outside of one's employer, such as an IRA, though this result is reversed for the self-employed. While we also see some evidence that home equity values increase in an economically meaningful way, this result is not statistically different from zero.

Taken together, our evidence from the NFCS and SIPP paired with the prior literature on mandates suggest that while early-life financial education has the potential to improve outcomes around credit and debt—two outcomes that have important long-term consequences—the gains to retirement savings are not as apparent. Thus, it might make more sense for time-constrained personal finance courses to focus more carefully on topics pertaining to budgeting, debt, and credit before moving to retirement savings. Additionally, a focus on researching financial topics may be more broadly used than something specific to retirement savings, particularly if the policies and tax structures around retirement savings vehicles are ripe to change for the future. Based on findings from prior literature, the workplace or tax time may be better suited to cover financial education related to retirement savings (Boyer et al. 2020; Collins and Urban 2016; Duflo and Saez 2003).

2. Background

This section discusses the ways in which states incorporate personal finance content into required high school curricula. It begins by explaining when different states passed these graduation requirements. It then parses out the ways in which early-life financial education may affect retirement savings in adulthood.

2.1 State personal finance graduation requirements

We build upon prior work that estimates the effects of personal finance graduation requirements in high school on the credit, debt, and savings decisions of adults (Brown et al. 2016; Harvey 2019; Stoddard and Urban 2020; Urban et al. 2020; Harvey 2020; Mangrum 2021). While we use a strategy similar to Stoddard and Urban (2020), we rely upon updates to the state policy data from Burke et al. (2020). We document the state policies in Table A.1. Twenty-four states require that students complete some personal finance content prior to graduating from high school, with nearly all states implementing policies for those graduating high school after 2000. This means that students must have either (1) a standalone course in personal finance, (2) a required class that embeds personal finance topics, such as Economics or Math, or (3) a required set of personal finance standards that must be incorporated into a greater content area (e.g., Social Studies). Twenty-six states and the District of Columbia do not require any personal finance content to be incorporated in the high school curriculum. While schools in states without a personal finance requirement could add content on their

own, this should bias us against finding an effect. Indeed, 23 percent of schools within states that do not have a requirement still require personal finance content be incorporated in the high school curriculum (Urban 2020). Other studies also present conservative estimates but are still able to detect effects on AFS use (Harvey 2019), as well as credit, debt, and savings behaviors (Brown et al. 2016; Urban et al. 2020).

In some state standards, retirement savings is directly included as a required topic. For example, in Missouri's personal finance course requirement, the standards require students to identify employee retirement options (e.g., 401ks, IRAs, employee stock options) and learn about why it is important to start saving early for retirement. Eleven states in total, of the 24 requiring personal finance content, currently include retirement planning in their standards. Using hand-collected data from online course catalogs on the specific personal finance courses required and offered in U.S. high schools for the 2020–2021 academic year, 1,524 of the 18,480—or 8% of—total classes containing personal finance content recorded directly mentioned retirement or retirement savings in some way.⁵ There were 8,047 recorded schools across the country with some personal finance content offered or required, where many schools have multiple personal finance course options (e.g., financial algebra, personal finance, etc.). Overall, about 19 percent of the recorded schools directly include some content regarding retirement planning.

Below are three course descriptions from schools that have incorporated retirement planning into personal finance-related coursework. The first course description shows how an algebra class can include math that allows individuals to better understand retirement planning. The second course description paints a picture of a personal finance class that covers the full gauntlet of potential topics: career decisions, budgeting, risk, insurance, credit, homeownership, taxes, and retirement. It also discusses skills in addition to knowledge. The third course description has fewer topic areas but more closely represents an average personal finance class, with a few more topics (e.g., retirement savings) than the average course may include.

Example 1 from an Alabama school (Algebra with Finance): Math concepts and skills are applied through study and problem-solving activities in workforce situations in the following areas:

banking, investing, employment and income taxes, automobile ownership and operation, mathematical operations, consumer credit, independent living, and retirement planning and budgeting. This course may be used as the fourth math credit, a substitute for Algebra II, or an elective.

Example 2 from an Arizona school (Personal Financial Literacy): Students need to be informed about their financial responsibilities today and to prepare for the real choices ahead. In this course they will learn about career decisions, money management, financial security, credit management, resource management, risk management, and consumer rights and responsibilities. Students will learn budgeting, taxation, insurance, real estate, retirement planning, and the effective and efficient use of credit. The implementation of the ideas, concepts, and skills contained in this course will enable students to implement those decision-making skills they must apply and use to become wise and knowledgeable consumers, savers, investors, users of credit, money managers, citizens, and members of a global workforce and society.

Example 3 from a Michigan school (Personal Finance): This course is designed to help students make wise decisions in the marketplace. The student will learn how to make sound economic decisions. Topics will include earning and paychecks, paying taxes, spending plans, consumer issues, types of credit and the wise use of each, saving and investing, types of insurance coverage, banking services, housing choices, and planning for retirement.

Various stakeholders currently debate whether high school personal finance coursework should include content on retirement planning. Since retirement is so far down the road for them, students may be less engaged in the topic. Further, teachers often have limited time to cover personal finance topics—particularly those required to incorporate it into another subject. For many students, instruction about avoiding financial mistakes with credit cards, payday loans, or student loans stands to make

⁵ For more information on the hand-collected data, see Urban (2020), Urban (2021), and Luedtke and Urban (2021). The data for the 2018–2019, 2019–2020, and 2020–2021 academic years are located at <https://www.carlyurban.com/home/financial-education>

a larger short- and long-run financial impact than covering retirement savings. Thus, time spent on retirement savings may detract from budgeting, credit, postsecondary education financing, or insurance—things that become relevant for students the second they graduate and sometimes sooner.

2.2 Potential mechanisms

In this study, we consider people ages 25-40, as this has allowed for enough time to pass after the mandated financial education as well as securing employment and completing their education. We are interested in retirement savings in this mid-adulthood period because there are several potential mechanisms by which financial education in high school could affect retirement savings.

First, retirement savings is directly included in the standards of some required personal finance courses. With courses directly discussing the importance of retirement planning, students may take the topic more seriously at a younger age, save earlier, and have larger accounts in adulthood since their accounts will begin accruing interest earlier. Even when retirement savings is not directly taught in the curriculum, the financial literacy gained from learning about long-term loans, interest rates, and savings in general can easily translate to making good retirement decisions. Beyond financial literacy, personal finance courses often teach students skills, including those needed to do the research to make good financial decisions. This ability to research and seek out information may increase the likelihood that young adults make good retirement planning decisions.

Second, personal finance coursework could improve savings, as students who have completed this coursework have been shown to make fewer mistakes early in life. For example, Harvey (2019) shows that required personal finance education reduces reliance on high-cost borrowing through payday loans. With fewer costly mistakes, young adults have a better credit record and may be able to start putting money aside for retirement sooner, as opposed to digging themselves out of credit card debt. This could let them build up retirement savings at a younger age.

While the first two mechanisms suggest that financial education may increase retirement savings, it could be that financial education actually decreases retirement savings for those age 25–40. This would be consistent with the life cycle theory of consumption, which

purports that most young adults would initially borrow to smooth consumption over the life cycle (Modigliani 1966). For example, early life financial education could lead students to focus more on acquiring skills that allow them to be marketable in the workforce. Acquiring any form of postsecondary education or training costs more than what most young adults can immediately pay upfront. While Stoddard and Urban (2020) show that financial education graduation requirements do not affect college attendance, they do show that financial education induces students to borrow more Stafford loans.⁶ This could increase retention and result in students accumulating more debt, investing more in their human capital. If this is the case, young adults may give up saving earlier for higher educational attainment, higher future incomes, and better jobs.

3. Data

To consider the causal effects of financial education graduation requirements on retirement savings, we merge the state policy data described in Section 2 with data from the National Financial Capability Study (NFCS). To corroborate our findings in the NFCS, we pair the policy data with the Survey of Income and Program Participation (SIPP). Importantly, we choose datasets that include both the state of residence and age of respondent to accurately assign the policy.

3.1 NFCS data

The NFCS data is a nationally representative survey intended to study the financial capability of adults. These data are also state-representative with samples of at least 500 people per state each wave. We use data from the 2012, 2015, and 2018 waves of the NFCS—the years that include both state of residence and age. Survey respondents answer a battery of questions pertaining to the financial situation of the household, ranging from whether the individual uses formal banking to questions pertaining to financial stress. The survey additionally asks questions about household demographics. Employment status is particularly important to this study, where we separate our effects for those who work full-time for someone

⁶ Stafford loans are a set of student loans that the federal government offers directly to undergraduate and graduate students. For most students, Stafford loans offer lower interest rates and more flexible repayment options than private student loans borrowed directly from financial institutions.

else, are employed at all and work for someone else, and are self-employed.

For this study, we focus on questions pertaining to retirement accounts and other assets. Since retirement savings decisions are more likely to happen at the household level, we consider household accounts as opposed to just individual respondent accounts. Our main variables of interest are whether the household has any retirement accounts, whether the household has a retirement account through their employer, whether the household has a retirement account outside of their employer (e.g., an IRA), and whether the household has other investment accounts outside of retirement accounts (e.g., stocks, bonds, mutual funds, or other securities). Since other assets may crowd out retirement savings, we are also interested in whether the respondent or spouse owns their home.

In addition to account ownership, we explore other outcomes in the NFCS pertaining to financial security in retirement. First, the NFCS asks the respondent if they have figured out how much money they will need in retirement, where under half (42 percent) of individuals say yes. Second, the survey asks if the respondent is worried about running out of money in retirement. Specifically, they respond from 1–7, where 1 is strongly disagree and 7 is strongly agree, to the following statement: “I worry about running out of money in retirement.” The average is 4.99, suggesting that more people are concerned than not. A third pertinent survey question asks if the household has taken a hardship loan from retirement accounts in the last twelve months. Since this type of loan can have negative tax consequences, it could be that those who better understand retirement accounts through financial literacy education are less likely to take out such loans. However, only 11 percent of respondents with any retirement savings reported taking a hardship loan, suggesting perhaps they are only used during real hardship.

We build a sample of individuals aged 25 through 40 to track them after they have entered adulthood and are likely to complete their schooling. This way, they have transitioned from borrowing for their human capital accumulation to saving for their future. Since most policies went into place for those graduating after 2000, we cannot credibly identify their effects for those over 40.

Figure 1 Panel A shows household-level account ownership by type: 66 percent of households have any retirement savings account, 28 percent have a retirement account outside of an employer, and 62 percent have a retirement account through their current employer. This suggests that most retirement accounts come from attachment to employers. Other assets are also important: 52 percent of households are homeowners, and 32 percent of households have stocks, bonds, mutual funds, or other securities that are not in retirement accounts.

When we split account ownership averages by employment type, additional trends emerge in Figure 1 Panel B. Those employed full-time have the highest levels of account ownership across all categories. At the other end of the spectrum, only 25 percent of those reporting that they are unemployed and less than half of those not in the labor force have any retirement savings. Another important difference is the account ownership among those employed full-time by an external employer and the self-employed. While the two groups are equally likely to have a non-employer retirement fund, equally likely to have non-retirement investments, and have similar homeownership rates, those working for someone else are over 25 percentage points more likely to have any retirement account. This suggests that a lack of attachment to a formal employer could complicate securing enough retirement savings. The difficulty in saving for retirement in self-employment could reduce innovation through small business entrepreneurship.

3.2 SIPP data

We corroborate our findings from the NFCS data with the SIPP. The SIPP is a nationally representative longitudinal survey intended to examine income distributions and public assistance program participation. Each SIPP panel follows individuals and households over a five-year period, but we specifically employ pooled first waves of the 2014 and 2018 SIPP. The SIPP captures detailed information on an array of matters, importantly including employment and financial assets. We focus on assets that include those pertaining to retirement accounts and homeownership. We additionally examine overall net worth.

The SIPP collects individuals’ assets holdings once annually, with amounts as of the “last day of the reference period” (December 31st) being recorded.

Like the NFCS, our main variables of interest from the SIPP include if one has any retirement accounts; if one has a retirement account through their employer; if one has a retirement account outside their employer, and if one owns their home. Unlike the NFCS, the SIPP only asks about an individual's retirement account ownership rather than a household's retirement account ownership. Additional variables of interest from the SIPP include total amounts held in retirement accounts; value of home equity; and total net worth. When it comes to asset levels, we examine both the individual-level and the household-level totals.

Policymakers employ the SIPP to establish public assistance eligibility criteria. Accordingly, it oversamples low-income populations. Low-income populations, given their resource constraints, often struggle to save and build assets. Asset ownership and levels are captured in the SIPP, including employer and non-employer retirement savings. This lets us 1) examine potential effects on the extensive (asset ownership) as well as intensive margins (asset levels), and 2) examine how robust our results are relative to a separate sample.

4. Empirical strategy

We use variation across states in the year when personal finance coursework was first required for graduation. Specifically, we use two-way fixed effects (TWFE) difference-in-difference models to estimate the effects of financial education graduation requirements on retirement savings from the NFCS and the SIPP. We alternate our dependent variables (Y) to be a variety of measures pertaining to retirement savings. Equation (1) shows our empirical model, which we estimate using a linear probability model with standard errors clustered at the state level that are corrected for heteroskedasticity.

$$Y_{[i, s, y, t]} = \alpha_0 + \alpha_1 \text{FinEd}_{[i, s, y]} + \alpha_2 X_i + \beta_t + \gamma_s + \delta_y + \epsilon_{[i, s, y, t]} \quad (1)$$

In Equation (1), the coefficient of interest is α_1 , which tells us the causal effect of requiring personal finance instruction in high school on retirement savings outcomes for individual i in state s who was 18 in year y and responding in survey year t . We assign the variable FinEd based on the state of current residence and the year the individual was age 18.⁷ This assumes individuals live in the same state in which they attended high school, as in the prior literature (Brown et al. 2016; Harvey 2019; Urban et al. 2020). Further,

fewer than 30% of individuals migrate across states within their adult lifetime (Molloy et al. 2011).

We control for two individual-level demographic characteristics X_i : race/ethnicity and gender. Though these controls are likely determined prior to the policy, we further show that results are robust to omitting these controls. We omit controls that the policy could plausibly affect, such as income and education. All models include state fixed effects (γ_s), fixed effects capturing the year the individual was 18 (δ_y), and survey year fixed effects (β_t). The error term is $\epsilon_{[i, s, y, t]}$. Our standard errors are clustered at the state level—the level of policy variation—and account for heteroskedasticity. Since most dependent variables are dichotomous, we estimate linear probability models. One exception is for the financial stress variable—worrying about running out of money in retirement—which is a scale between 1 and 7. For that model, we use OLS. Another exception is that in the SIPP data, we additionally look at account balances. Since these are heavily skewed, we use an inverse hyperbolic sine (IHS) model.

For the sample of adults in our survey data, 24 states required personal finance instruction for high school graduation. While one of these states (Illinois) does not have a control group of students who graduated high school before the mandate went into place, 23 states changed their policy with those graduating high school in 1998 or later. This allows for a valid control group within those states over time. Further, 26 states and the District of Columbia do not require any personal finance instruction within high school curricula. That means the bulk of our variation comes from the difference between never-treated states and newly-treated states (Goodman-Bacon 2021). In additional robustness checks, we verify that our results do not change when we exclude the one always-treated state (Illinois).

7 While the NFCS does ask individuals whether they have had financial education, as well as if this happened in school, recall bias will result in an overestimate of our effects. Those self-reporting financial education receipt display higher correlations in financial literacy overall and within those exposed to state mandates. While measures of “mandated” and measures of “recalled” are positively correlated, its correlation is not high enough to be deemed substitutes or proxies (Harvey 2021). Women and urban residents are preliminarily shown to have higher levels of discrepancy – and we also might worry that self-reported measures are picking up effects of interest in personal finance more so than effects of the education itself (Harvey 2021).

Difference-in-difference models require that the trends of the treatment and control groups would have been parallel in the absence of the policy. While not directly testable, we use event study specifications to show that there is no clear evidence of a non-parallel trend in anticipation of the policy. These plots are shown in Figure 2 for our main variables of interest and Figures A.1 and A.2 for additional variables of interest. We plot coefficients for the difference between the treatment and control in each time period, excluding the period just before the policy went into effect, as well as 95 percent confidence intervals.

These models also require that no other factors systematically changed while states implemented personal finance graduation requirements. We are not worried about violating this assumption for three reasons. First, these policies often take several years to make it through legislative bodies and implementation is often lagged several years after the passage of legislation. Thus, the timing is semi-random. Second, nearly every state in the country has initiated legislation to promote personal finance education in schools. While less than half of states have ultimately been successful, the interest comes from both political parties and is not limited to a specific set of states. Third, previous research has shown that there are no clear economic conditions correlated with the implementation of financial education graduation requirements (Stoddard and Urban 2020).

Finally, we will split our sample based on employed status. Since we are interested in the differences in effects of financial education on retirement savings among the full-time employed, self-employed, and those who work full-time or part-time for someone else, we document that there are no effects of state-required financial education on employment. Table 1 documents this in the NFCS, where we show that the results are neither statistically nor economically significant. In the NFCS sample, we consider household-level employment, meaning whether the respondent or spouse work full-time, part-time, are self-employed, or are unemployed. Table A.2 shows a similar result in the SIPP, though it instead looks at own employment. While the results are not statistically significant, the magnitudes are slightly larger in the SIPP. Even so, Column (1) suggests that state-required personal finance coursework increases the likelihood of working full-time by 1.9 percentage points, or roughly 3 percent.⁸

5. Results

Do financial education graduation requirements change the likelihood of having a retirement account? Pairing the evidence from the event studies in Figure 2 with the α_1 coefficients estimated in Equation (1) presented in Table 2, the answer is no. Panel A of Figure 2 shows that the effect of state-required personal finance instruction on the likelihood of having any retirement account is close to zero for every cohort following the requirement. The magnitude of the estimate in Table 2 is also small: required financial education increases the likelihood of having an account by 0.8 percentage points, or 1 percent. This null result is similar when considering the likelihood of having a retirement account through an employer (Figure 2 Panel C, Table 2 Column (3)). Since having an account through an employer is the most common way of holding retirement savings and financial education does not affect whether someone is employed, it is perhaps not surprising that retirement accounts through employers are unaffected by financial education.

We do see that financial education does modestly increase the likelihood of having an account outside of an employer (Table 2 Column (2)). Though the magnitude is economically significant (a 1.3 percentage point or 4.6 percent increase), it is not statistically different from zero and not depicted in the event study in Figure 2 Panel B.

Since retirement savings does not happen in a vacuum, one must consider other assets when trying to assess how individuals' finances have shifted due to financial education. For this reason, we additionally look at non-retirement investments, such as stocks, bonds, mutual funds, and securities outside of retirement accounts, and whether the household owns their home. It could be that individuals are investing in other assets instead of retirement accounts. Table 2 Columns (4)-(5) show these results. While having financial education in high school reduces the likelihood of non-retirement investing, this effect is not statistically different from zero at the 10 percent level,

⁸ We found no evidence that these financial education policies affected sector of employment using the SIPP.

though it does translate to a 5 percent reduction. Further, the rate of homeownership increases by 0.3 percentage points and appears in the event study in Figure A.1 Panel B.

We validate that our primary results are robust to additional specifications. First, we show that omitting always-treated states—in this case just Illinois—does not change our estimate. Second, we show that excluding our individual-level control variables does not change our estimates.

The remainder of Table 2 shows estimates by employment status. The results for those working full-time or at all for an employer closely mimic those for the overall sample. However, the results for the self-employed paint a slightly different picture. The effects of required financial education on having any retirement accounts and having non-retirement investments flip sign, while the effects on having a retirement account outside of an employer and owning a home are larger. In no case are any of these results statistically different from zero. However, they are relatively large economically and may point to more investment in one's own business ventures. While this does not generate higher likelihood of retirement savings, it could be optimal if the value of their independent ventures become more lucrative due to additional investment.

We next turn to additional outcomes that point to financial literacy, financial stress, and financial hardship in Table 3. Column (1) shows that financial education in high school increases the likelihood of figuring out how much is needed for retirement by 1.1 percentage points or 2.6 percent, though this is not statistically different from zero. This effect is a precisely estimated zero for those working full-time or at all working for an external employer. However, it is much larger in magnitude for the self-employed, though again not statistically different from zero. This suggests that the self-employed may take high school financial education seriously in determining their present and future budgets.

Column (2) of Table 3 shows that state-required personal finance instruction does not have a statistically or economically meaningful impact on how worried individuals are about running out of money in retirement. When considering financial hardship, Column (3) again shows that financial education does not have a clear effect on whether households have

taken a hardship loan from their retirement accounts in the last year. The sign for all subgroups is negative, suggesting a decrease, though it remains imprecisely estimated.

The results from the NFCS paint a picture of the overall U.S. population. We next supplement these findings with results from the SIPP to validate our findings and consider the intensive margin. The median household (individual) income in the SIPP analytic sample is \$71,554 (\$32,347).⁹ Table 4 shows the overall effects for the comparable variables. We see that personal finance education still does not have an economically or statistically significant effect on whether someone has any retirement account or an account through an employer (Columns (1) and (3) of Table 4), it plausibly increases the likelihood that they have a non-employer retirement account in adulthood (Column (2) of Table 4). For the overall sample, required financial education increases the likelihood of having a non-employer retirement account like an IRA by 1.8 percentage points or 11 percent although this is not statistically different from zero. This effect primarily represents those working full-time or at all for someone other than themselves. The magnitudes are similar, and the signs are mostly consistent with the findings from the NFCS in Table 2.

The evidence from the SIPP in Table 4 taken in combination with the evidence from the NFCS in Table 2 paints an interesting picture for the self-employed. First, financial education reduces the likelihood of having any retirement account for both populations. The magnitude is roughly similar, though in the SIPP results, it becomes statistically different from zero. It is also economically meaningful: required financial education decreases the likelihood of having a retirement account by 11 percentage points or 32 percent. Further, the effect of financial education on having a non-employer retirement account goes from positive in Table 2 to negative in Table 4, where it becomes statistically different from zero at the 10 percent level. While we caution that samples are smaller for the self-employed population, these results suggest that financial education lessons early in life

9 Note that the SIPP sample excludes GED recipients and those without a high school diploma. When examining the full sample ages 25–40, the median household (individual) income is \$63,806 (\$28,096).

may have different effects for those who are their own boss.

So far, the analyses have focused on account ownership, retirement planning, financial stress around retirement savings, and financial hardship. Table 5 moves beyond the extensive margin of account ownership and instead looks at the unconditional value of accounts. Since the amounts are skewed, we use an inverse hyperbolic sine transformation. Overall, required financial education in high school decreases the value of retirement accounts in adulthood by 0.8 percent, increases overall net worth by 1 percent, and increases home equity by 19 percent, though these estimates are imprecisely estimated. The signs are consistent if we look at household values instead of individual values.

As described in the potential mechanisms' subsection, it is possible that the effects only exist in states where retirement savings is directly included in the state's standards. However, in no case do we see a statistical difference in effect sizes based on whether the state requires schools to incorporate retirement savings in the personal finance curriculum.

6. Conclusions

Are teenage years the right time to learn about retirement planning? In this paper, we show that required personal finance education in high school has limited impacts on retirement planning, retirement account ownerships, and retirement savings amounts. Since the presence of employer-sponsored retirement savings are common, we are careful to split our

sample by employment types and retirement account types. Even so, we find no clear evidence that financial education in high school improves the likelihood of saving for retirement.

Prior research investigating the causal effects of financial education graduation requirements on credit and debt behaviors finds large improvements, particularly for lower-income populations (Brown et al. 2016; Harvey 2019; Stoddard and Urban 2020; Urban et al. 2020; Harvey 2020; Mangrum 2021). Taken together with the present study, we recommend that states adding financial education standards prioritize topics such as budgeting, credit, debt, and saving for emergencies before moving to retirement savings.

Our results also complement a literature that investigates the causal effect of workplace financial education on retirement savings. Collins and Urban (2016) find that randomly assigned financial education increases retirement savings by roughly \$30 per month among those making approximately \$30,000 per year. Further, Duflo and Saez (2003) find that workplace financial education increases the likelihood of participating in a retirement program among a more affluent population. These findings, taken together, suggest that the workplace may have more success in affecting retirement planning than the classroom. While most of this paper focuses on the extensive margin, future research should determine if early financial education increases account balances.

References

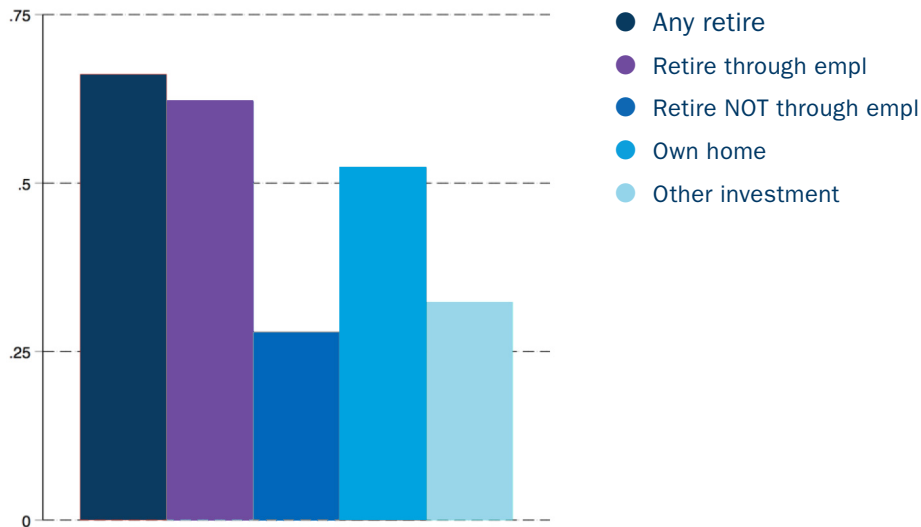
- Alessie, Rob, Maarten Van Rooij, and Annamaria Lusardi. "Financial Literacy and Retirement Preparation in the Netherlands." *Journal of Pension Economics & Finance* 10, no. 4 (2011): 527–45.
- Baker, Andrew, David F. Larcker, and Charles C. Y. Wang. "How Much Should We Trust Staggered Difference-In-Differences Estimates?" European Corporate Governance Institute – Finance Working Paper No. 736/2021, Rock Center for Corporate Governance at Stanford University Working Paper No. 246 (2021). <http://dx.doi.org/10.2139/ssrn.3794018>
- Bernheim, B. Douglas, Daniel M. Garrett, and Dean M. Maki. "Education and Saving: The Long-Term Effects of High School Financial Curriculum Mandates." *Journal of Public Economics* 80, no. 3 (2001): 435–65.
- Boyer, Martin, Philippe d'Astous, and Pierre-Carl Michaud. "Tax-Sheltered Retirement Accounts: Can Financial Education Improve Decisions?" *Review of Economics and Statistics* (2020): 1–45. https://doi.org/10.1162/rest_a_00973.
- Brown, Meta, John Grigsby, Wilbert van der Klaauw, Jaya Wen, and Basit Zafar. "Financial Education and the Debt Behavior of the Young." *The Review of Financial Studies* 29, no. 9 (2016): 2490–2522.
- Bruhn, Miriam, Luciana de Souza Leao, Arianna Legovini, Rogelio Marchetti, and Bilal Zia. 2016. "The Impact of High School Financial Education: Evidence from a Large-Scale Evaluation in Brazil." *American Economic Journal: Applied Economics* 8, no. 4 (2016): 256–95.
- Burke, Jeremy, J. Michael Collins, and Carly Urban. "Does State-Mandated Financial Education Affect Financial Well-Being?" *Center for Financial Security Working Paper* (2020). https://centerforfinancialsecurity.files.wordpress.com/2020/09/state-fin-ed-well-being_burke_collins_urban_final.pdf.
- Christelis, Dimitris, Loretta I. Dobrescu, and Alberto Motta. "Early Life Conditions and Financial Risk-Taking in Older Age." *Journal of the Economics of Ageing* 17 (2020). <https://doi.org/10.1016/j.jeoa.2020.100266>.
- Cole, Shawn, Anna Paulson, and Gauri Kartini Shastry. "High School Curriculum and Financial Outcomes: The Impact of Mandated Personal Finance and Mathematics Courses." *Journal of Human Resources* 51, no. 3 (2016): 656–98.
- Collins, J. Michael, and Carly Urban. "The Role of Information on Retirement Planning: Evidence from a Field Study." *Economic Inquiry* 54, no. 4 (2016): 1860–1872.
- Deuffhard, Florian, Dimitris Georgarakos, and Roman Inderst. "Financial Literacy and Savings Account Returns." *Journal of the European Economic Association* 17, no. 1 (2019): 131–64.
- Duflo, Esther, and Emmanuel Saez. "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment." *Quarterly Journal of Economics* 118, no. 3 (2003): 815–42.
- Frisancho, Verónica. "The Impact of School-Based Financial Education on High School Students and Their Teachers: Experimental Evidence from Peru." *Inter-American Development Bank Working Paper* No. 871 (2018).
- Goodman-Bacon, Andrew. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics* (2021). <https://doi.org/10.1016/j.jeconom.2021.03.014>.
- Harvey, Melody. "Impact of Financial Education Mandates on Younger Consumers' Use of Alternative Financial Services." *Journal of Consumer Affairs* 53, no. 3 (2019): 731–69.
- Harvey, Melody. "Does State-Mandated High School Financial Education Affect Savings by Low-Income Households?" Working paper (2020). https://static1.squarespace.com/static/5c4d314bb27e3999d515a9e4/t/5e0a1b2841180e2960023175/1577720633380/Harvey_FinEd_Savings_Working+Paper_v20191230.pdf.
- Harvey, Melody. "Who Recalls Taking Personal Finance?" Working paper (2021).
- Horn, Samantha, Julian Jamison, Dean Karlan, and Jonathan Zinman. "Does Lasting Behavior Change Require Knowledge Change? Evidence from Savings Interventions for Young Adults." Working Paper No. 28011. National Bureau of Economic Research. (2020).

-
- Kaiser, Tim, Annamaria Lusardi, Lukas Menkhoff, and Carly Urban. "Financial Education Affects Financial Knowledge and Downstream Behaviors." *Journal of Financial Economics* (2021, forthcoming).
- Luedtke, Allison, and Carly Urban. "Do High Schools Choose Financial Education Policies Based on Their Neighbors?" *IZA Discussion Paper No. 14288* (2021).
- Lührmann, Melanie, Marta Serra-Garcia, and Joachim Winter. "The Impact of Financial Education on Adolescents' Intertemporal Choices." *American Economic Journal: Economic Policy* 10, no. 3 (2018): 309–32.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S. Mitchell. "Optimal Financial Knowledge and Wealth Inequality." *Journal of Political Economy* 125, no. 2 (2017): 431–77.
- Lusardi, Annamaria, and Olivia S. Mitchell. "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth." *Journal of Monetary Economics* 54, no. 1 (2007): 205–24.
- Lusardi, Annamaria, and Olivia S. Mitchell. "How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness." *Quarterly Journal of Finance* 7, no. 3 (2017): 1750008.
- Lusardi, Annamaria, Olivia S Mitchell, and Vilsa Curto. "Financial Literacy among the Young." *Journal of Consumer Affairs* 44, no. 2 (2010): 358–80.
- Mangrum, Daniel. "Personal Finance Education Mandates and Student Loan Repayment" Working Paper (2021). <http://dx.doi.org/10.2139/ssrn.3349384>.
- Modigliani, Franco. "The Life Cycle Hypothesis of Saving, the Demand for Wealth and the Supply of Capital." *Social Research* 33, no. 2 (1966): 160–217.
- Molloy, Raven, Christopher L. Smith, and Abigail Wozniak. "Internal Migration in the United States." *Journal of Economic Perspectives* 25, no. 3 (2011): 173-96.
- Stoddard, Christiana, and Carly Urban. "The Effects of State-Mandated Financial Education on College Financing Behaviors." *Journal of Money, Credit, and Banking* 52, no. 4 (2020): 747–76.
- Urban, Carly, Maximilian D. Schmeiser, J. Michael Collins, and Alexandra Brown. "State Mandated Financial Education and the Credit Behavior of Young Adults." *Economics of Education Review* 78 (October 2020): 101786.
- Urban, Carly. 2020. "Financial Education in High Schools across America." Working Paper. <http://www.montana.edu/urban/Report.pdf>.
- van Rooij, Maarten C. J., Annamaria Lusardi, and Rob J. M. Alessie. "Financial Literacy and Stock Market Participation." *Journal of Financial Economics* 101, no. 2 (2011a): 449–72.
- van Rooij, Maarten C. J., Annamaria Lusardi, and Rob J. M. Alessie. "Financial Literacy and Retirement Planning in the Netherlands." *Journal of Economic Psychology* 32, no. 4 (2011b): 593– 608.
- van Rooij, Maarten C. J., Annamaria Lusardi, and Rob J. M. Alessie. "Financial Literacy, Retirement Planning and Household Wealth." *The Economic Journal* 122, no. 560 (2012): 449–78.

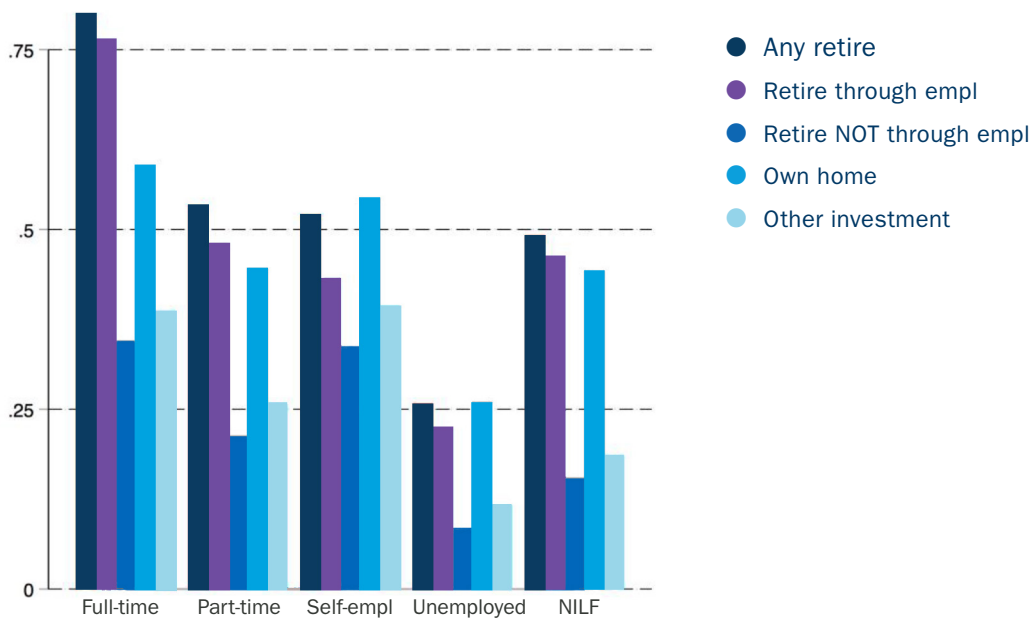
Tables and figures

Figure 1. Summary statistics of account ownership

Panel A: Account ownership by type



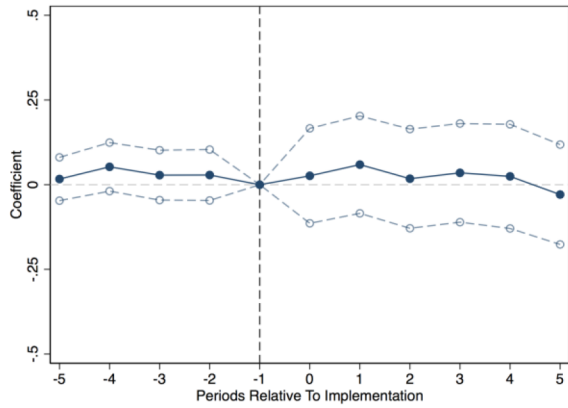
Panel B: Account ownership by employment status



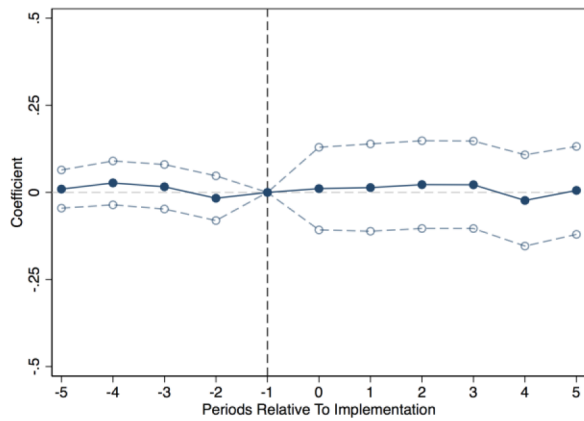
Notes: Panel A shows mean participation in any retirement account, retirement accounts through employers, retirement accounts not through employers, homeownership, and other investments in stocks, bonds, mutual funds, or other securities outside of retirement accounts, respectively. Panel B parses these averages by the respondent's employment type: full-time work for someone else, part-time work for someone else, self-employment, unemployed, and not in the labor force (NILF stands for "not in labor force," and is classified as full-time student; homemaker; permanently sick, disabled, or unable to work; retired).

Figure 2. Event studies: Retirement accounts

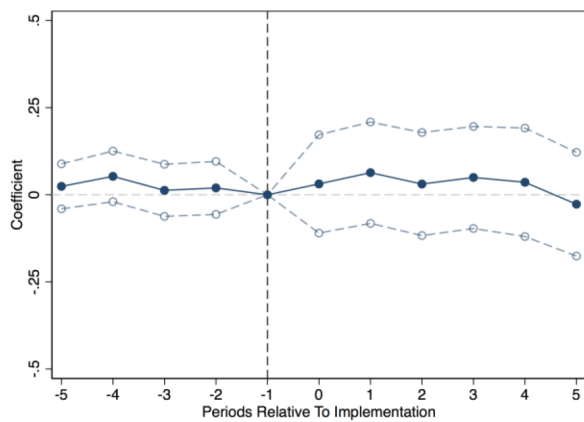
Panel A: Has any retirement account



Panel B: Has retirement account outside of employer



Panel C: Has retirement account through employer



Notes: Coefficients with 95% confidence errors depicted, where robust standard errors are clustered at the state level. All models are linear probability models that estimate an event study specification. The models omit t-1 and includes all controls from Equation (1).

Table 1. Overall effects of financial education on employment

	Works full time (1)	Works part time (2)	Is self employed (3)	Is employed (4)
<i>Fin Ed</i>	-0.016	-0.010	-0.025	0.005
	(0.014)	(0.019)	(0.018)	(0.008)
Mean DV	0.74	0.41	0.58	0.08
N	21,408	21,408	21,408	21,408

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated. All models estimate Equation (1). Data come from the NFCS. Dependent variables reflect whether the head of household or spouse meet each category and zero otherwise. *Fin Ed* equals one if the respondent lives in state where financial education was required for high school graduation at the time they were 18 and zero otherwise.

Table 2. Effects of financial education on account ownership

	Has any retire account (1)	Has ret. plan NOT through employer (2)	Has ret. plan through current employer (3)	Has non-retire investments (4)	Owens home (5)
OVERALL					
<i>Fin Ed</i>	0.008	0.013	-0.005	-0.017	0.003
	(0.024)	(0.022)	(0.024)	(0.015)	(0.020)
Mean DV	0.66	0.28	0.62	0.32	0.52
N	20,196	19,907	20,094	19,046	21,016
FULL-TIME EMPLOYED					
<i>Fin Ed</i>	0.003	0.014	-0.008	-0.013	0.000
	(0.026)	(0.024)	(0.026)	(0.020)	(0.020)
Mean DV	0.78	0.32	0.75	0.35	0.58
N	15,043	14,736	14,973	14,518	15,564
SELF-EMPLOYED					
<i>Fin Ed</i>	-0.111	0.014		-0.078	0.039
	(0.075)	(0.056)		(0.050)	(0.056)
Mean DV	0.57	0.33		0.39	0.58
N	2,150	2,147		2,029	2,247
EMPLOYED BUT NOT SELF-EMPLOYED					
<i>Fin Ed</i>	0.007	0.011	-0.004	-0.019	-0.002
	(0.027)	(0.025)	(0.027)	(0.019)	(0.019)
Mean DV	0.75	0.31	0.71	0.34	0.56
N	16,415	16,123	16,331	15,816	17,029

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated. All models estimate Equation (1). Data from the NFCS 2012, 2015, and 2018. Dependent variables reflect whether the household meet each category and zero otherwise. *Fin Ed* equals one if the respondent lives in state where financial education was required for high school graduation at the time they were 18 and zero otherwise. Each employment category is based on either the head of the household or spouse.

Table 3. Effects of financial education on retirement-related outcomes

	Figured out how much is needed for you to retire (1)	Worry about running out of money in retirement (1–7, 7=most worried) (2)	Have taken a loan from retirement account in the last 12 months (3)
OVERALL			
<i>Fin Ed</i>	0.011 (0.022)	-0.007 (0.093)	-0.010 (0.016)
Mean DV	0.42	4.99	0.11
N	20,405	14,740	16,799
FULL-TIME EMPLOYED			
<i>Fin Ed</i>	0.000 (0.028)	0.023 (0.120)	-0.012 (0.022)
Mean DV	0.47	4.98	0.13
N	15,173	10,971	12,055
SELF-EMPLOYED			
<i>Fin Ed</i>	0.033 (0.049)	-0.054 (0.322)	-0.028 (0.041)
Mean DV	0.46	4.93	0.14
N	2,204	1,600	1,924
EMPLOYED BUT NOT SELF-EMPLOYED			
<i>Fin Ed</i>	0.000 (0.027)	-0.024 (0.107)	-0.011 (0.021)
Mean DV	0.46	4.99	0.13
N	16,604	12,005	13,259

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated, except for in Column (2). All models estimate Equation (1). Data from the NFCS 2012, 2015, and 2018. Low income is classified as having a household income under \$25,000 per year.

Table 4. Effects of financial education on account ownership, SIPP

	Has any retire account (1)	Has ret. plan NOT through employer (2)	Has ret. plan through current employer (3)	Owns home (4)
OVERALL				
<i>Fin Ed</i>	-0.003 (0.024)	0.018 (0.012)	0.000 (0.023)	-0.005 (0.021)
Mean DV	0.47	0.17	0.41	0.56
N	21,536	21,536	21,536	21,536
FULL-TIME EMPLOYED				
<i>Fin Ed</i>	-0.005 (0.029)	0.019 (0.016)	0.003 (0.025)	0.002 (0.020)
Mean DV	0.59	0.20	0.54	0.58
N	13,680	13,680	13,680	13,680
SELF-EMPLOYED				
<i>Fin Ed</i>	-0.109** (0.045)	-0.083* (0.046)		0.033 (0.064)
Mean DV	0.34	0.26		0.61
N	1,193	1,193		1,193
EMPLOYED BUT NOT SELF-EMPLOYED				
<i>Fin Ed</i>	-0.001 (0.029)	0.021 (0.014)	0.005 (0.026)	-0.017 (0.020)
Mean DV	0.54	0.18	0.48	0.56
N	17,086	17,086	17,086	17,086

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated. All models estimate Equation (1). Data from the SIPP.

Table 5. Effects of financial education on own account balances

	RESPONDENT-LEVEL			HOUSEHOLD-LEVEL		
	Value of retirement accounts (1)	Home equity (2)	Net worth (3)	Value of retirement accounts (4)	Home equity (5)	Net worth (6)
<i>Fin Ed</i>	-0.008 (0.274)	0.186 (0.214)	0.011 (0.434)	0.002 (0.205)	0.087 (0.360)	0.038 (0.701)
Mean DV	\$23,537.73	\$22,577.34	\$93,055.76	\$65,445.12	\$67,966.03	\$269,467.90
N	21,536	21,536	21,536	21,536	21,536	21,536

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. IHS models estimated. All models estimate Equation (1). Data from the SIPP.

Appendix A

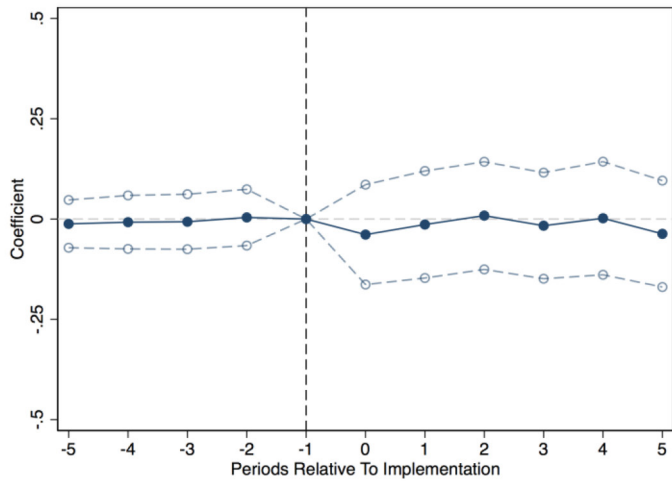
Table A.1. State policies

State	First graduating class required	State	First graduating class required
AK	No policy	MT	No policy
AL	2017	NC	2005
AR	2005	ND	2011
AZ	2005	NE	2014
CA	No policy	NH	No policy
CO	2009	NJ	2014
CT	No policy	NM	No policy
DC	No policy	NV	No policy
DE	No policy	NY	No policy
FL	No policy	OH	2014
GA	2007	OK	2014
HI	No policy	OR	2013
IA	2011	PA	No policy
ID	2001	RI	No policy
IL	1970	SC	No policy
IN	2013	SD	No policy
KS	No policy	TN	No policy
KY	No policy	TX	2007
LA	2005	UT	2008
MA	No policy	VA	2015
MD	No policy	VT	No policy
ME	2017	WA	No policy
MI	1998	WI	No policy
MN	No policy	WV	No policy
MO	2010	WY	2002
MS	No policy		

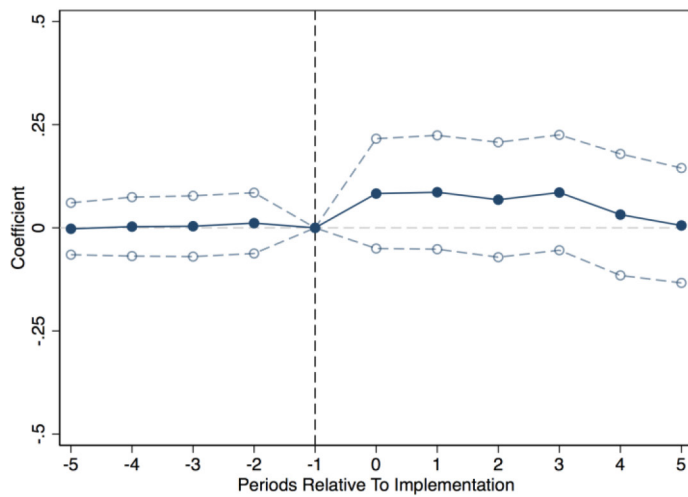
Notes: This table shows the first year in which students were required to complete a personal finance course. Some states have adopted policies since 2021 that will come into effect beginning with the graduating class of 2022. These are not listed.

Figure A.1. Event studies: Other assets

Panel A: Has non-retirement investments



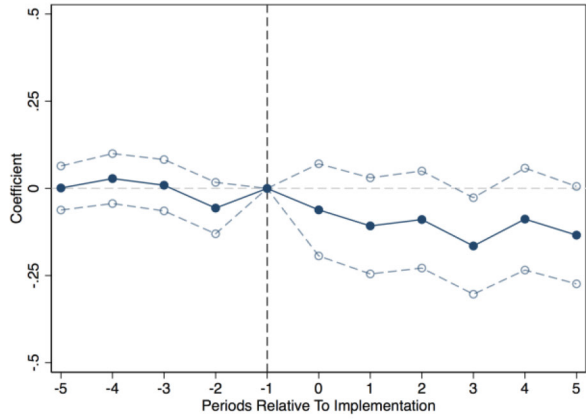
Panel B: Owns home



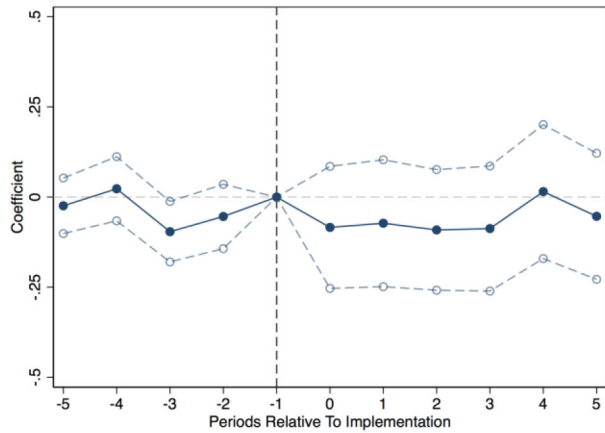
Notes: Coefficients with 95% confidence errors depicted, where robust standard errors are clustered at the state level. All models are linear probability models that estimate an event study specification. The models omit t-1 and includes all controls from Equation (1).

Figure A.2. Event studies: Other retirement savings-related outcomes

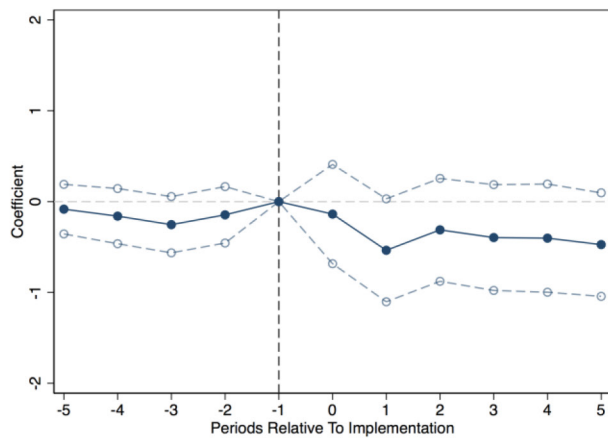
Panel A: Have figured out how much you need for retirement



Panel B: Has taken out a hardship loan from a retirement account



Panel C: Worried about running out of money in retirement (scale of 1-7, where 7 is most worried)



Notes: Coefficients with 95% confidence errors depicted, where robust standard errors are clustered at the state level. All models are linear probability models that estimate an event study specification. The models omit t-1 and includes all controls from Equation (1).

Table A.2. Overall effects of financial education on employment, SIPP

	Works full time (1)	Works part time (2)	Is self employed (3)	Is unemployed (4)
OWN EMPLOYMENT				
<i>Fin Ed</i>	0.019 (0.019)	-0.022 (0.015)	-0.002 (0.006)	0.002 (0.009)
Mean DV	0.68	0.17	0.06	0.14
N	21,539	21,539	21,502	21,539

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated. All models estimate Equation (1).

Table A.3. Effects of financial education on retirement savings, robustness checks

	Has any retire account (1)	Has ret. plan NOT through employer (2)	Has ret. plan through current employer (3)	Has non-retire investments (4)	Owns home (5)
OMITTING ALWAYS TREATED					
<i>Fin Ed</i>	0.007 (0.024)	0.011 (0.022)	-0.004 (0.024)	-0.019 (0.015)	0.002 (0.020)
Mean DV	0.66	0.28	0.62	0.32	0.52
N	19,670	19,394	19,569	18,556	20,474
EXCLUDING CONTROLS					
<i>Fin Ed</i>	0.008 (0.024)	0.016 (0.021)	-0.004 (0.024)	-0.013 (0.015)	0.005 (0.018)
Mean DV	0.66	0.28	0.62	0.32	0.52
N	20,196	19,907	20,094	19,046	21,016
LOW-INCOME ONLY					
<i>Fin Ed</i>	0.053 (0.033)	0.009 (0.024)	0.047 (0.030)	-0.030 (0.032)	-0.040 (0.034)
Mean DV	0.66	0.28	0.62	0.32	0.52
N	3,723	3,790	3,712	3,155	3,967

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated. All models estimate Equation (1), dropping states with policies before 1980.

Table A.4. Effects of financial education on retirement-related outcomes

	Figured out how much is needed for you to retire (1)	Worry about running out of money in retirement (1-7, 7=most worried) (2)	Have taken a loan from retirement account in the last 12 months (3)
DROPPING ALWAYS TREATED			
<i>Fin Ed</i>	0.010 (0.022)	0.005 (0.093)	-0.009 (0.016)
Mean DV	0.42	4.99	0.11
N	19,877	14,326	16,354
NO CONTROLS			
<i>Fin Ed</i>	0.015 (0.021)	-0.011 (0.091)	-0.008 (0.016)
Mean DV	0.42	4.99	0.11
N	20,405	14,740	16,799
LOW-INCOME ONLY			
<i>Fin Ed</i>	0.083** (0.035)	0.004 (0.157)	-0.009 (0.023)
Mean DV	0.42	4.99	0.11
N	3,843	2,635	3,389

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Robust standard errors clustered at the state level in parentheses. Linear probability models estimated, except for in Column (2). All models estimate Equation (1). Data from the NFCS 2012, 2015, and 2018. Low income is classified as having a household income under \$25,000 per year.

About the authors

Melody Harvey is an Assistant Professor of Consumer Science at University of Wisconsin–Madison. Dr. Harvey’s research focuses on how consumer and social policies affect financial capability among economically vulnerable populations in the United States. Most of her work to date analyzes the effect of K-12 financial education policies on financial outcomes of young adults across different socioeconomic groups, but she also examines payday lending regulations and social welfare policies. Dr. Harvey has a Ph.D. in policy analysis from Pardee RAND Graduate School, an M.P.P. from Pepperdine University, and a B.A. in economics from Reed College.

Carly Urban is an Associate Professor of Economics at Montana State University and a Research Fellow at the Institute for Labor Economics (IZA). Dr. Urban’s research is focused on how financial education and government policies affect consumer decision making. In addition to publishing in peer-reviewed academic journals, Dr. Urban has been a Visiting Scholar at the Federal Reserve Board and the Consumer Financial Protection Bureau. Her work has been covered by the mainstream media, including NPR, the Washington Post, and the Wall Street Journal. She holds a Ph.D. in Economics from the University of Wisconsin–Madison and a B.A. in economics and international affairs from the George Washington University.

About the TIAA Institute

The TIAA Institute helps advance the ways individuals and institutions plan for financial security and organizational effectiveness. The Institute conducts in-depth research, provides access to a network of thought leaders, and enables those it serves to anticipate trends, plan future strategies, and maximize opportunities for success.

To learn more, visit www.tiaainstitute.org.



**Join the conversation online:
@TIAAInstitute**

Meolody Harvey: Dept. of Consumer Science, University of Wisconsin–Madison. E-mail: maharvey3@wisc.edu

Caryl Urban: Dept. of Ag. Economics and Economics, Montana State University and IZA. E-mail: carly.urban@montana.edu

The authors thank Kyle Musser and Kelsey Gordon for excellent research assistance. The project described received funding from the TIAA Institute and Wharton School’s Pension Research Council/Boettner Center. The content is solely the responsibility of the authors and does not necessarily represent official views of the TIAA Institute or Wharton School’s Pension Research Council/Boettner Center.

TIAA Institute is a division of Teachers Insurance and Annuity Association of America (TIAA), New York, NY. ©2022 Teachers Insurance and Annuity Association of America-College Retirement Equities Fund, 730 Third Avenue, New York, NY 10017