The Effects of Access to Banking Services on Elementary Student's Financial Learning: A Field Study☆

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Abstract

One way that children can learn about financial management is through the experience of managing a bank account. This field study describes two school-based banking programs targeted to elementary-age students. Using differential access to a bank in school, as well as randomized seed deposits for opening an account, we are able to estimate the effects of students being banked on changes in knowledge and attitudes. Overall, we find that students who are induced into being banked show more positive views of banking services, as well as more financial experiences. The estimated effects of students being banked on financial knowledge and savings are positive but not statistically significant.

Keywords: financial literacy; financial behavior; savings

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1. Introduction

Financial literacy, including knowledge, attitudes and confidence to take on required personal financial management tasks over the life course (Lusardi and Mitchelli, 2007), is developed a number of different ways. One way to learn is from the formal teaching of financial concepts in schools or other settings. People also learn personal finance information from parents, families and peers (Webley and Nyhus, 2006; Harrah and Friedman, 1990; Erskine et al., 2006). Another form of learning is from experiences—by trial and error as people make decisions and engage in personal finance practices. Access to sources of financial learning vary, however, leaving some people with lower levels of financial literacy later in life, potentially having economically significant effects on wellbeing (Lusardi and Mitchell, 2011).

Owning a basic savings account is one way that children first learn some financial management skills through their experiences of making deposits and managing balances (Webley and Nyhus, 2006; Furnham, 1999). Some schools even offer access to accounts during the school day (Friedline, 2012). These school banking programs have existed for well over a century (Bowman, 1922; Cruce, 2002). While there is no comprehensive census of banks and credit unions in the United States with in-school branches, there have been efforts at the federal and local level to promote banking services in schools (Murray, 2017). School banking programs are also facilitated through national or state organizations[1].

Kourilsky (1977), Rupp (2014), and Walstad et al. (2017) show that experiential learning is a key component to the process of how students gain an understanding of key concepts. Foundational work in education by Dewey (1938) suggests that learning is best achieved when participants actively engage in tasks that are relevant and meaningful to them. This suggests that access to financial institutions, including regular opportunities to make deposits or withdrawals, could enhance student's financial literacy. For example, Laney (1989) finds that first graders who learn the concept of opportunity cost through real-life experiences demonstrate greater understanding and retention of financial topics than those who learn through a story.

Access to basic financial services early in life may help people to overcome some of the barriers to developing financial capability later in life (Johnson and Sherraden, 2007; Lucey and Giannangelo, 2006; McCormick, 2009). Some studies show a positive relationship between people who report having a savings account in childhood with positive financial outcomes later in life (Choi et al., 2009; Elliott, Jung and Friedline, 2010; Elliott and Sherraden, 2013; Friedline and Song, 2013; Sherraden et al., 2013; Peng et al., 2007). For example, Brown and Taylor (2015) show that having savings as a child is associated with an increased probability of saving during adulthood. Choi et al. (2009) finds that high school seniors with bank accounts outperform those without accounts on a financial literacy test, even after controlling for parental income and education.

[1] For a discussion, see the FDIC's youth savings website: `https://www.fdic.gov/youthsavings`

One limitation with prior studies is that self-reports of savings or banking activity by adults recalling their childhood may not be reliable. Moreover, there may be alternative explanations for saving as a child and later life financial behaviors, including having more affluent parents.

Aside from having a savings account, there are a limited opportunities for children age 8 to 12 to engage in personal financial decisions. One additional form of economic experience at this age is receiving an allowance (Barnet-Verzat and Wolff, 2002). An allowance exposes children to managing regular inflows and outflows of money. Some studies find that allowance payments often begin during elementary school, and increase in frequency and amount as children become teenagers (Furnham, 1999; Furnham and Kirkcaldy, 2000; Furnham, 2001; Ashby, Schoon and Webley, 2011). Bucciol and Veronesi (2014) found that an allowance combined with parental guidance are related to financial capability. This is also consistent with Gudmunson and Danes (2011) who develop a conceptual model of family financial socialization, which highlights the influence of family interactions and relationships on the development of financial capability.

Financial education classes in school have been shown to be effective at improving financial literacy in some studies (Becchetti, Caiazza and Coviello, 2013; Batty, Collins and Odders-White, 2015). Children who use a savings account may reflect upon these concrete experiences to test their assumptions, deepening their learning (see Wascalus (2012) for applications). Accounts may help motivate children to learn financial education content by demonstrating real-world applications of the material. Potentially, combining education with savings accounts in school may have even larger effects than financial education classes alone.

Although school banking programs potentially have benefits, these programs require partnerships between school districts and financial institutions, which involve an ongoing investment of time and financial resources. Importantly, some states restrict the ability of minors to open (non-custodial) accounts in their own name, which can create additional barriers and a greater need for parental involvement (Choi et al., 2009). Financial institutions may not favor administering the low-balance transaction accounts that school branches tend to encourage. Parents and community members may worry that financial institutions are essentially granted a monopoly to serve students and could exploit these relatively unsophisticated consumers who are unequipped to protect themselves from potential harm.

Using data from a field study conducted in elementary schools with and without bank branches in two school districts, we address several key questions related to this larger literature on how children form financial literacy: (1) Are children more likely to have savings accounts if there is a banking branch at their school? (2) Does a student having an account enhance their ability to learn financial topics? (3) Do children with savings accounts have more positive financial experiences?

We have not found prior research showing the connection between access to banking services in schools and individual student's contemporaneous account ownership or usage. Similarly, we found few studies on how children's financial literacy, attitudes or behaviors are improved when

they have a savings account. Sherraden et al. (2011) shows that children who take part in a school-based saving club report improvements in financial knowledge, but the club also included formal educational activities, making it difficult to identify account access as the mechanism. Berry, Karlan and Pradhan (2018) conducted a randomized trial in Ghana where all students had access to savings at school. They find children saved more, in part by moving money stored at home to the account at school.

We find that students are more likely to have a savings account when they have a bank branch available in their school, even after controlling for school-level characteristics, suggesting that bank-in-school programs may be a means of facilitating access to savings accounts. Using an instrumental variable approach where we predict a student being banked using the presence of a bank in school and randomized seed deposits as instruments, we find a strong relationship between being banked and students having positive attitudes about banking services. There are also modest effects of students with accounts being more likely to receive an allowance from their family. There are positive but not statistically significant effects on changes in financial knowledge and savings attitudes. There is not a strong effect of accounts boosting the effects of financial education, however. Overall, offering bank accounts in school may be a complement to other strategies to build financial literacy, and can increase the rates of young people having savings accounts.

We next provide more background on the field study and schools used in this analysis, followed by the identification strategy to estimate the effects of students having savings accounts, and then the findings from these estimates. We conclude with a summary of the results and a discussion of the implications of this work.

2. Field Study

From 2012 to 2014, schools in Eau Claire, Wisconsin and Amarillo, Texas took part in a field study to test financial education and access to bank accounts in 4th and 5th grade classrooms. The study primarily tested a five-hour classroom-based financial education program provided randomly by classroom (see Batty, Collins and Odders-White (2015)). However, the design also allows us to study access to a savings account in school as a way to predict which students have bank accounts.

2.1. Eau Claire, Wisconsin

During the spring semester of 2012, all 4th and 5th grade students in the Eau Claire School District participated in a five-lesson classroom financial education program. The program covered savings, financial decision-making, and money management. Half of the district's classrooms were randomly assigned to participate in the financial education program during the study period, and the remaining classrooms participated immediately after the study's follow-up assessment had been completed. All students were given an assessment prior to the start of the financial education program and again after the program ended. The same design was used during the fall of 2013 for the next cohort of 4th graders.

Royal Credit Union operates School $ense branches in 6 of 13 Eau Claire elementary schools. Modeled after the Save for America program, these custodial accounts allow children and a parent or guardian to be co-owners of a savings account. A parent or guardian applies online or in-person to open the account, allowing their child to make deposits and withdrawals at school. School branches are operated at least once a week and are set up in classrooms or common areas. Deposits can be of any amount, and elementary school students can withdraw up to $20 at a time with an adult co-owner signature. Students receive stamps for each deposit, and they earn a prize for every fourth deposit (for example, special pencils, stickers, etc).

2.2. Amarillo, Texas

During the spring semester of 2013, 4th grade students in the Amarillo Independent School District participated in an program similar to the curriculum implemented in Wisconsin. Students were randomly assigned at the classroom level to participate in the financial education program. While Eau Claire had a well-established bank in school program, in Amarillo, banks in schools were implemented for the study.[2] In the spring semester of 2013, 15 schools were randomly assigned to open in-school bank branches, and half of the students who attended these schools were randomly selected to receive a $25 seed deposit, if they opened an account.

The schools partnered with Happy State Bank, a Texas-based community bank who has offered the Kids' Bank program in schools since 1997. These joint custodial savings accounts have no minimum balance requirements. Children were also allowed to open accounts in their name only without the signature of their parents.[3] Like in Wisconsin, branches were set up in a common area of the school. Students could make deposits before or after school, or at lunchtime each week. Each time a child made a deposit into their account, he or she received a small prize as an incentive to save.

2.3. Data

Data from Texas was collected in 2013, and data from Wisconsin was collected in 2012 and 2013. All students in the study completed a baseline survey at the start of the semester, and a follow-up survey at the end. Both surveys used the same assessment items, allowing for pre-post comparisons. The surveys included a 13-item financial literacy quiz and other questions to measure student attitudes and experiences with personal finances.

The knowledge quiz assesses topics including saving, budgeting, opportunity cost, compound interest, and spending (see Appendix for items). Students also answered an item that measures whether they receive an allowance or pocket money from their family.[4] Students answered an item

[2] Three schools in Amarillo had a pre-existing bank in school program; these schools are excluded from the analysis.

[3] A key issue for financial institutions is if state laws allow the collection of an overdraft or account fee against a minor. Texas laws allow financial institutions to engage in limited contracts with minors for savings accounts. See: Gibson and Belsky (2017)

[4] *Do you get pocket money or an allowance?* ('Yes', 'No', or 'Don't know or Not sure')

that measures if they think banks serve children.[5] Students also answered a question that measures the age-appropriateness of children saving money.[6] All items measuring attitudes/frequencies are measured on a five-point scale.

In addition, administrative data from partner financial institutions on bank accounts are available for students with accounts. Bank data are available for 166 students in Texas and 255 students in Wisconsin. The bank data include transactions students made from October to June in both the 2011-2012 and 2012-2013 academic years for Wisconsin, and, in Texas, from January to June in the 2012-2013 academic year. The data include weekly bank activity including net deposits and transactions that we aggregate up to the school year.

The Texas, study includes 756 students from 36 schools in the Amarillo Independent School District. Fifteen of these schools start a bank in school during the study period. A total of 324 students have access to savings accounts at school in our sample.

Student banking status is based on students self-reports in the survey. We are able to verify account ownership based on other information. In Wisconsin, we use a survey of parents. We also confirm student self-reports based on bank administrative data in both study locations. If the parent survey or administrative data reports that the student is banked, they are coded as banked, regardless of the student report. If the student does not have a parent survey or school bank account, we rely on their self-reported banking status. We find few cases (4 percent) where students who have accounts do not report having an account. There are students who report having an account but are not in the school-based bank data. This is plausible, however, since students could have non-school based accounts. We also find students are reasonably accurate (82 percent) in reporting not saving at school if they do not have a school-based account.[7]

Figure 1 depicts the deposit activity for students with bank in school accounts. The top figure shows the distribution of the average deposit amount for students banking at school. The majority of students make deposits below $5. The bottom figure shows the distribution of deposit frequencies at school, constructed by dividing the number of weeks a deposit was made at school by the number of weeks the bank operated during the school year. Most students make deposits less than 20 percent of the total available opportunities to make deposits. This figure is notable in that deposit amounts and volumes are low, but reasonable given that children are depositing change and small bills.

Parental consent was necessary for student enrollment in the study, and consent forms were sent home with students and could be returned to school or mailed back, with a follow-up mailing to those parents who did not initially respond. Written student assent was used with students in

[5] *Some kids feel that bank accounts are only for adults. How often to you feel that way?* ('Always', 'Most of the time', 'Sometimes', 'Almost never', or 'Never')

[6] *Some kids feel that saving money is only for adults. How often to you feel that way?* ('Always', 'Most of the time', 'Sometimes', 'Almost never', or 'Never')

[7] Table 13 verifies the accuracy of students reports versus bank account administrative data where available.

Wisconsin, and verbal student assent in Texas. No data is used without both parental consent and student assent.

2.4. Student and School Characteristics

Table 1 shows the student data at baseline. Overall, 71.5 percent of students in Wisconsin are banked, and just under 36 percent of students in Texas. More than half of students report earning an allowance, which suggests they have income that could be saved. Attitudes about savings and banks are similar at both school systems, but students in Wisconsin show higher financial literacy scores. Schools in Wisconsin have lower rates of minority students and lower rates of free and reduced price school lunches. Students in Texas are more likely to meet state standards for reading and math.

Table 2 shows school-level characteristics by whether there is a bank in school. Bank in school programs were randomized at the school-level in Amarillo, Texas. This was not the case in Eau Claire, Wisconsin, where banks in schools predate this study. In Wisconsin, schools with banks have a lower share of economically disadvantaged students. They also have higher share of minority students and a lower share that meet state reading and math standards. These differences reflect the selection of banking programs into more affluent schools. However, in Texas, the randomization of schools results in no significant differences between schools with branches and without.

Table 3 shows mean differences in student and school characteristics by whether there is a bank in school at the student-level. Students with access to a school-based banking program have accounts at a higher rate in both study locations. Students with a bank in their school report that their school lets kids save while few students without a bank in school report that their school lets them save.

There are significant differences in the share of minority students, share of free/reduced price lunch eligible students, and share of students who met state reading standards by bank in schools, however. Unlike Wisconsin, these differences reflect more disadvantage at schools with banks in Texas; there is a greater share of minority and free/reduced price lunch eligible students. In Texas, students differ in their baseline financial knowledge; students with a bank in school have slightly higher financial literacy scores. These differences highlight the potential importance of focusing on changes from baseline levels in our analysis, and adding in school level controls.

Table 4 shows student and school characteristics by assignment to the seed deposit in Texas. The $25 seed deposit was randomly assigned among students in the Amarillo, Texas study who attend a school that implemented a new bank in school. The table largely reflects that the randomization of the seed deposit was successful. There are significant differences in banking status, with a higher rate of banked among students who received the seed deposit reporting that they save at school. This reflects students who opened accounts at the start of the semester, around the same time that the baseline survey was being collected.

3. Identification Strategy

We begin with an estimate of a student being banked, using bank in school as an independent variable to test if banks in schools are associated with higher rates of students having savings accounts, controlling for school characteristics. This specification is based on an indicator for a student with an account:

$$\begin{aligned} Banked_{i2} = \alpha &+ \beta_1(BIS_s) + \beta_2(\%minority_s) + \beta_3(\%free\,lunch_s) \\ &+ \beta_4(\%math\,standard_s) + \beta_5(\%reading\,standard_s) + \beta_6(Seed_i) + \epsilon_s \end{aligned} \tag{1}$$ {Eqn0}

In this model, labeled $Banked_{i2}$, is the student banking status in the follow-up survey, verified when possible with other data sources. The main estimate of interest is β_1, the school, s, having banking services available in school. β_2 is a variable for the school level percentage of students who are from non-white racial or ethnic groups. β_3 is the school level share of students who qualify for free and reduced priced school lunch. β_4 and β_5 are school level shares of students meeting the state standards for reading and math, respectively. In all estimates, ϵ is the standard error clustered at the school level.[8] These models are estimated for the full sample and then each state separately. We also show both linear and maximum likelihood estimates. In Texas, we add an additional independent variable, β_6, for a student in a school with a bank being assigned to a seed deposit (no students without a bank in school were assigned a seed deposit).

We next turn to how banks in school may enhance financial outcomes learning:

$$\begin{aligned} Y_{i2} = \alpha &+ \beta_0(Y_{i1}) + \beta_1(BIS_s) + \beta_2(financial\,education_i) \\ &+ \tau(BIS_s \times financial\,education_i) + \mathbf{X}_s + \epsilon_s \end{aligned} \tag{2}$$ {Eqn2}

The outcome of interest, labeled Y_{i2}, is again the student i's banking status, followed by: (1) attitude towards saving; (2) attitude towards banking; (3) receipt of an allowance–a measure of financial behavior; (4) summed financial literacy score; and (5) item-response theory financial literacy score. Controls for the baseline Y_{i1} and the vector of controls γ_s at the school level as shown in Equation 1.

In this specification, τ is the combined effect of a student i being in a classroom assigned to financial education and in a school s, where there is a bank in school. β_1 and β_2 each estimate effects of financial education and bank in school alone, respectively. This specification tests how banks in school may enhance student learning. The same controls are in the vector $\mathbf{X}_{i,s}$.

[8] There are 44 schools total, and 33 in Texas, but only 12 in Wisconsin. We recognize this is a small number of clusters; the results are similar without school level clustering.

The specification for the set of five financial outcomes from Equation 2 by banking status is shown below:

$$Y_{i2} = \alpha + \beta_0(Y_{i1}) + \beta_1(Banked_i) + \mathbf{X}_s + \epsilon_s \tag{3}$$ {Eqn}

We estimate this specification for Texas and Wisconsin, as well as both sites combined. The main estimate of interest is β_1, the student, i, banking status. ϵ is the standard error clustered at the school level.

The goal of children banking at earlier ages is to encourage them to build a savings habit and enhance learning about personal finances. Table 2 suggests caution in interpreting any causal claims about the effects of banks in schools on student outcomes when using a naïve estimate with a bank in school indicator where banks are not randomly assigned. To deal with the endogeneity of students being banked–that is the most affluent or motivated students may be the most likely to be banked *and* have positive outcomes for learning and attitudes–we use an instrumental variable (IV) approach to estimate the causal effect of banking status on these outcomes.

This approach is best suited to Texas where there is random assignment of new bank in school programs at the school-level and random assignment to a $25 seed deposit at the student-level, conditional on attending a school with a bank in school program. In Wisconsin, where no seed deposit is offered and banks in schools predate the study, we have to rely on the assumption that students and parents are not selecting into neighborhood school districts in order to access banking services at school. The fact that some schools have banks and others do not allows us to use banks in schools as a plausibly exogenous predictor of student banking status. Since this is a weaker strategy than in Texas, we show results for the pooled sample and for each state's sample separately.

We estimate the same outcomes as shown in Equation 3, omitting the non-IRT summed score for parsimony, but estimating the effects of a student being banked using bank in school, and seed deposit assignment in Texas, as a predictor:

$$Y_{i2} = \alpha + \beta_0(Y_{i1}) + \beta_1(\widehat{Banked}_i) + \mathbf{X}_s + \epsilon_s \tag{4}$$ {Eqn1}

The main estimate of interest is $\beta_1(\widehat{Banked}_i)$, the student, i, banking status as predicted by the student attending a school with access to a savings account in school. This is intended as a causal estimate of a student being banked on the outcomes in Equation 3. These local average treatment effects (LATE) can be interpreted as the causal effect of being banked on the outcomes for those students who are induced into banking by the bank in school and/or seed deposit assignment. All of the specifications, including the IV models, use linear probability ordinary least squares

estimates (Angrist and Pischke, 2009). Standard errors are clustered at school-level (the level of treatment) in all models.

4. Results

The analysis of the student data shows a number of consistent patterns. We begin with estimates of students being banked, which also serve as the basis for the later IV estimators. Next, we estimate the effects of financial education and banks in school, specified in Equation 2. We then provide naïve estimates of students being banked on attitudes towards saving, banking, receiving and allowance and financial knowledge, as shown in Equation 2. All of these estimates are changes within students from baseline to follow-up, controlling for school-level observables. We first examine Wisconsin, then Texas, and then a pooled sample. Finally, we present the two-stage least squares IV estimates of a student being banked on the outcomes of interest.

4.1. Banks in School and Students Being Banked

Do banks in schools increase the rate of students owning a bank account? Table 5 shows that students at schools with access to savings accounts are about 21 to 35 percentage points more likely to be banked.

Table 5 shows a strong positive effect of bank in school and seed deposit assignment on a student being banked. Column (1) shows the estimate from the linear probability model for both Wisconsin and Texas. Bank in school increases the likelihood that a student is banked by 34.9 percentage points, about a three-quarters of a standard deviation. Column (2) shows that the marginal effect of bank in school on banked from the probit model. The estimates from the linear and non-linear specifications are both positive and significant. The probit shows a 34 percent marginal effect on being banked, while the linear model is approximately 53 percent as a marginal effect (given a mean of 65). These estimates control for the share of minority students, share of economically disadvantaged students, and share of students who meet state reading and math standards at the school level.

The Texas sample estimate shows the effects of *adding* a bank to a school. In the study, these branches were assigned to schools at random, an exogenous change that can be used to identify the effects of banks in schools. Here, adding a bank in school is associated with a 34 point higher rate of students being banked.

4.2. Banks in Schools and Financial Education

Figure 2 shows that a financial education course—which was randomly assigned by classroom—has a strong effect on changes in student knowledge over the study period (left panel). However, students who have a bank in their school show no real difference in learning compared to students in schools without banks. This graph supports the stylized fact that banks in school are no substitute for financial education in a classroom setting.

Using a regression framework, we can estimate the patterns in Figure 2. Table 6 displays an estimate of the influence of banks in schools on student learning using the interaction of banks in schools and the student being in a classroom assigned to financial education. The education has a strong direct effect on financial knowledge changes, but there is not a statistically significant interactive effect on knowledge gains from having a bank in school and being in a classroom with the financial education. Banks in school are associated with the student being banked and positive attitudes about banking, but no other outcomes. The effects of banks in school appear to be mainly to facilitate more students to obtain savings accounts.

4.3. Student Banking Status and Financial Outcomes

Does a student being banked influence students attitudes, behaviors or knowledge? Table 7 shows the estimates for students in Wisconsin. All of the columns show positive associations between being banked and changes in attitudes, behaviors and knowledge. Only two estimates are statistically significant, however. Students *with accounts* have more positive attitudes about banks in column (2) and are more likely to report gaining an allowance in column (3).

Table 8 shows the Texas schools, where more students became banked with the introduction of banks in schools and seed deposits. Again all of the estimates are positive, and most are statistically significant.

Together, Tables 7 and 8 are suggestive that students being banked may have desirable effects on some aspects of financial capability. Table 9 pools the two samples—here there is additional statistical power and all of the outcome measures are positive and statistically significant. Attitudes about savings are improved about one-fifth of a standard deviation. Attitudes about banking services are improved about one-third of a standard deviation. Reporting an allowance is 9 percentage points higher, or about 19 percent higher than baseline as a marginal effect. Financial knowledge is improved by about one-fifth of a standard deviation.

We remain concerned that students who have accounts are systematically different, and that naïve estimates of students being banked are upwardly biased by the most motivated or affluent students also being banked. However, bank in school may prove to be a exogenous predictor of a student being banked, which can then be used to estimate the effects of bank accounts on our outcomes of interest.

4.4. Instrumental Variable Estimates: Student Banking Status and Financial Outcomes

The next set of estimates use banks in schools and incentives to open accounts to predict students being banked as an instrumental variable to re-estimate the prior outcomes.

Table 5 shows the first-stage of the two-stage least squares IV estimator. Column (3) shows linear first-stage estimates for the Wisconsin sample only. The F-statistic is smaller (F=8.1) and suggests more caution with this weaker instrument. Column (4) shows first-stage estimates restricted to the Texas sample only. The specification also includes the second instrument besides

bank in school, the assignment to a seed deposit. Here the F-statistic is robust. Both instruments have a positive relationship with banking status. Banks in schools have a strong effect, and the additional $25 incentive offer among students at schools with banks is also associated a higher rate of students being banked.

Table 10 shows the IV estimate of students being banked using the combined sample. Here the instrument is a bank in school only. All of the coefficients are positive, but the standard errors are large. The only significant estimate is for attitudes about banks. The local average treatment effect for students induced into bank accounts by their bank in school program trend toward positive outcomes. These results are consistent with Table 9 in direction and magnitude.

Table 11 shows the IV estimate of students being banked using the Wisconsin sample. Here the instrument is a bank in school. None of the coefficients are statistically significant, but several estimates are negative. The standard errors are quite large. Recall, this sample had a weak F-test, and banks in schools were established over the last two decades in some schools but not others.

Table 12 uses the Texas data for an IV estimate of students being banked based on banks being introduced into schools and a $25 seed deposit. Like Table 10, these estimates have large standard errors but are positive. The estimates for attitudes about banks and allowance receipt are both statistically significant. Attitudes about banks are improved nearly a full standard deviation, or about 25 percent as a marginal effect from the mean. Reporting an allowance is about 35 percent higher than baseline as a marginal effect

Reports of an allowance are increased about 35 percent as a marginal effect. Allowance is a proxy for students being more engaged with financial issues. These students may be more successful in obtaining an allowance from their parents once they have an account, or more likely to request an allowance in the first place. Regardless, an allowance is an example of a economic experience early in life that might lead to developing greater financial capability later in life.

These IV estimates offer some assurance of the findings of the prior estimates of the relationship between having an account and financial outcomes. These results also highlight the potential endogeneity of banking status upwardly biasing naïve estimates, and serve as a caution in interpreting prior studies about the effects of being banked on various outcomes.

5. Conclusions

Previous studies suggest that youth savings account ownership alone or in conjunction with financial education may affect student financial knowledge, attitudes, and behavior. Schools adding a bank branch on site provides easy access to banking services and perhaps could provide students with a chance to practice financial capability skills.

We use data from field studies in two US school districts and find that students are more likely to have a savings account when there is a bank in their school. Students being banked is strongly facilitated by the presence of banks in schools. The subset of students who have accounts also

show better outcomes in terms of learning about finances and attitudes about banks and saving. Some of this appears to be driven by positive selection into bank accounts.

Exploiting a combination of a quasi-experimental design and true random assignment, we show that children being banked may have some positive effects on the financial attitudes and behaviors of children. There is little evidence of strong causal effects of banks in school on financial knowledge. Using an instrumental variable design, we find that students being banked, has positive effects on changes in positive attitudes about banks, and reporting an allowance, and positive, but not statistically significant effects on knowledge.

It seems likely that offering savings accounts in schools will lead to more children obtaining accounts. There also appear to be positive relationships between students being banked and students having improved attitudes about banking services and increased economic experiences, as measured by obtaining an allowance. Banks in schools can facilitate students being banked, and students having accounts may also be related to indicators that are consistent with improving financial capability. However, banking and savings programs are not a substitute for more direct financial education programs.

The patterns in these data are based on two field studies, with limited external validity. Savings programs, school-based accounts and banks in schools vary widely in their design and implementation. The Texas program was just being expanded, while the Wisconsin program was well-established. Not all programs may have the same appeal to students and parents. Moreover, introducing these programs in schools imposes some costs on school administration, and require time and attention from teachers and students. Many financial institutions may not want to manage in school programs, given the costs and low revenue potential.

Overall, these results are intriguing. If encouraging children to have savings accounts can improve their attitudes about banks, and lead to greater financial experiences like getting an allowance, the costs of offering bank accounts may be justified. These foundational experiences may determine the trajectory of children as they enter their teenage years and later young adulthood. Having a savings account may help them to avoid problems and become more engaged in money management. These outcomes require longer term study, however. Ideally future studies could follow students randomly assigned accounts from age 10 through age 25. This would require a large study across multiple schools, but hold promise to better understand how non-classroom activities influence financial capability and behavior.

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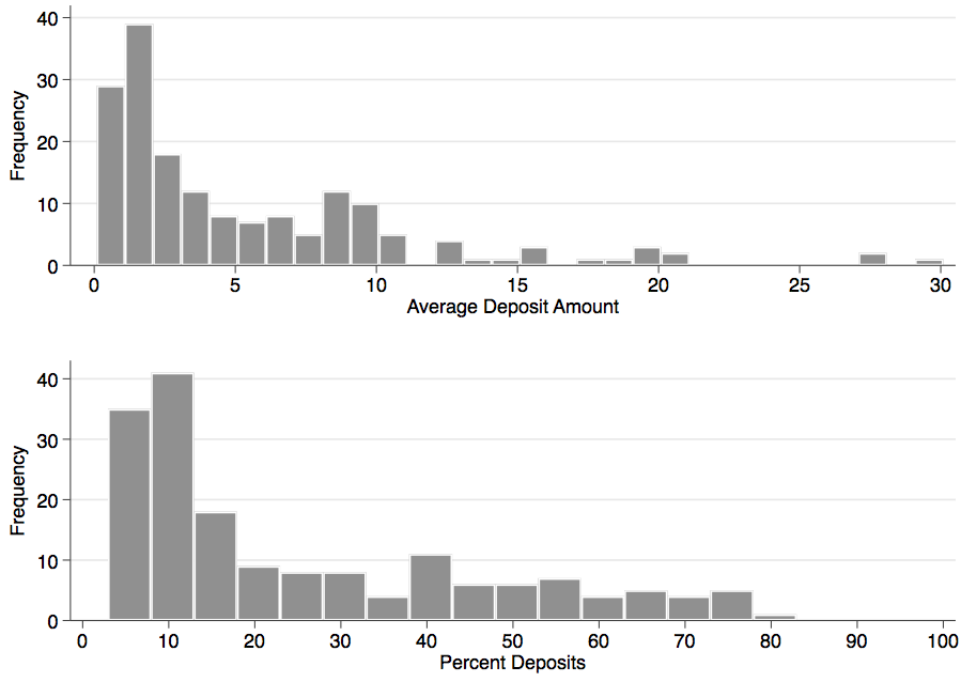
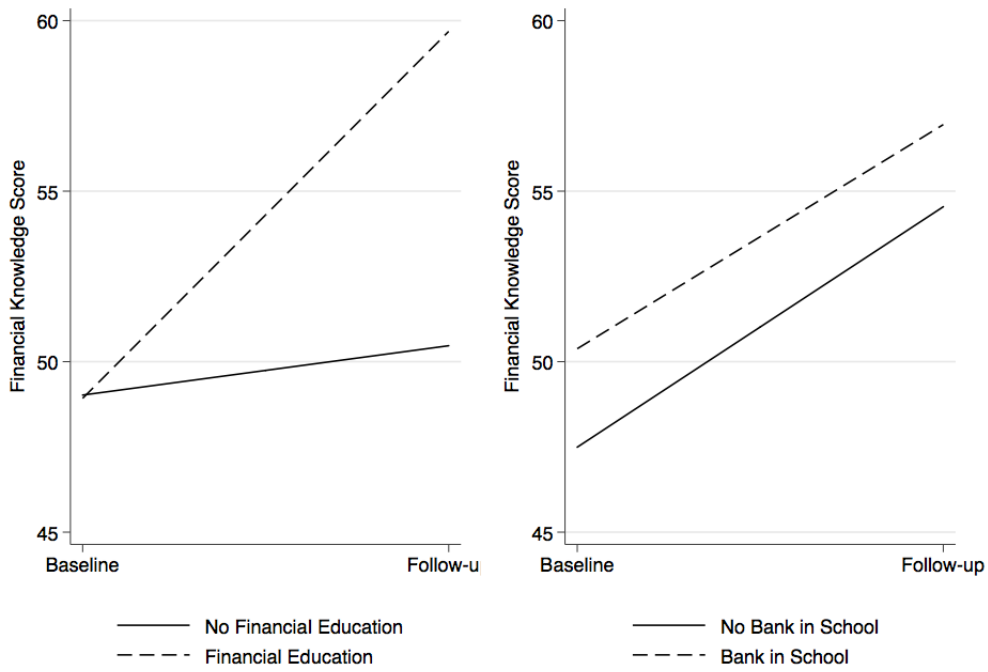
Figures



{fig1}

Figure 1: Distribution of Average Deposit Amount and Percent Deposit at School

The data is from the October 2011 to June 2012 and October 2012 to June 2013 Royal Credit Union Account Administrative Data and January 2012 to June 2013 Happy State Bank Account Administrative Data. The sample includes students who have a Royal Credit Union or Happy State Bank account whose parents agreed to releasing their child's bank account transactions excluding students with inactive accounts. The figures show the distribution of average deposit amount over the study period and percent of in-school banking days that the student made a transaction at school. In the top panel, each column is the number of students by a $1 average deposit amount. In the bottom panel, each column is the number of students by 0.05 school deposit days.



{fig2}

Figure 2: Financial Education Effects and Bank in School Effects on Financial Quiz Scores

The data is from the 2012 and 2013 Eau Claire Money F-I-T Student Survey for Wisconsin and 2013 Smarter Texans Save Student Survey collected at baseline and follow-up. The left panel shows the effects of a financial education on financial knowledge. The right panel shows the effects of bank in school programs on financial knowledge Financial knowledge is based on 11 quiz items using an IRT model for scoring that allows items to vary in their difficulty and discrimination parameters (two items are omitted from the original 13-item assessment based on poor discrimination). See Table 14 for details.

Tables

Table 1: Descriptive Statistics by Study Location

{T1}

	Wisconsin			**Texas**		
	Mean	SD	N	Mean	SD	N
Student Survey						
Are you banked?	0.715	0.452	646	0.359	0.480	635
Does your school let kids save?	0.578	0.494	567	0.444	0.497	514
Do you save at school?	0.436	0.497	358	0.355	0.480	259
Do you receive an allowance?	0.599	0.490	619	0.583	0.493	609
Kids Save	4.372	0.925	648	4.153	1.201	635
Kids Bank	4.232	1.028	650	3.846	1.291	635
Financial Literacy Score (Summed)	6.838	2.380	650	5.797	2.196	635
Financial Literacy Score (IRT)	52.735	9.610	650	45.039	8.406	635
School Data						
Minority	18.207	5.935	650	58.328	24.863	635
Free/Reduced Lunch	43.674	12.711	650	67.712	24.854	635
Meet State Math Standards	80.818	9.298	650	91.312	7.730	609
Meet State Reading Standards	82.462	8.158	650	89.394	8.861	635

Data is from the 2012 and 2013 Eau Claire Money F-I-T Student Survey for Wisconsin and 2013 Smarter Texans Save Student Survey for Texas collected at baseline. The unit of observation is a student. All responses except *Are you banked?* come from student survey only. *Are you banked?* is a binary variable that equals 1 if the student reports 'Yes' to *Do you currently have a savings account at a bank or credit union in your own name?*, parent reports *Does your child currently have a savings account at a bank or credit union in his or her own name?*, or student has bank account at baseline in bank account administrative data. Student report in Wisconsin supplemented with parent survey, and in Texas with bank account administrative data. *Does your school let kids save?* is a binary variable that equals 1 if the student reports 'Yes' to *Does your school let kids with savings accounts put money in their accounts at school?*, 0 otherwise. *Do you save at school?* is a binary variable that equals 1 if the student reports *Do you put money in a savings account while you are at school?*, 0 otherwise, conditional on *Does your school let kids save?* equal to 1. *Do you receive an allowance?* is a binary variable that equals 1 if the student reports 'Yes' to *Do you get pocket money or an allowance?*, 0 otherwise. *Kids Save* is a 5 point categorical variable of student reports of 'Always', 'Most of the time', 'Sometimes', 'Almost never', or 'Never' to *Some kids feel that saving money is only for adults. How often to you feel that way?* (reverse-coded). *Kids Bank* is a 5 point categorical variable of 'Always', 'Most of the time', 'Sometimes', 'Almost never', or 'Never' to *Some kids feel that bank accounts are only for adults. How often to you feel that way?* (reverse-coded).*Financial Literacy Score (Summed)* is the financial knowledge assessment score based on the sum of correct responses to 13 items at baseline. *Financial Literacy Score (IRT)* is the the financial knowledge assessment score at baseline based on a graded response model of 11 items that vary in their difficulty and discrimination parameters (two items omitted for performance on two parameters). See Table 14 for details.

Table 2: Differences in School Characteristics by Bank in School by Study Location (School-Level)

	No Bank	School Bank	Diff.	Obs
Wisconsin				
Minority	21.343	17.918	3.424	12
Free/Reduced Lunch	55.021	40.183	14.838*	12
Meet State Math Standards	76.783	81.967	-5.183	12
Meet State Reading Standards	77.450	83.367	-5.917	12
Texas				
Minority	62.128	64.427	-2.299	33
Free/Reduced Lunch	72.178	75.013	-2.836	33
Meet State Math Standards	89.824	89.867	-0.043	32
Meet State Reading Standards	88.000	88.400	-0.400	33

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

{T2}

Data is from Department of Public Instruction District and School Performance Reports from 2011-2012 and 2012-2013 academic years for Wisconsin and 2011 Amarillo Independent School District Administrative Data for Texas. The unit of observation is a school. The Happy State Bank Kids' Bank Program in Amarillo, Texas was randomized at the school-level. The Royal Credit Union School $ense program predates this study. *Minority* is the share of students in a school who are African American, Hispanic, American Indian, Asian, Pacific Islander, or Two or More Races. *Free/Reduced Lunch* is the share of students in a school who are eligible for the free or reduced price lunch program. *Meet State Math Standards* is the share of students in a school who met, in Wisconsin, 2011-2012 or 2012-2013 Wisconsin Knowledge and Concepts Examination (WKCE) Advanced or Proficient Level in Grade 4 Math, and, in Texas, 2011 Texas Assessment of Knowledge and Skills (TAKS) Math Standard (Grade 4 Math). *Meet State Reading Standards* is the share of students in a school who met, in Wisconsin, 2011-2012 or 2012-2013 Wisconsin Knowledge and Concepts Examination (WKCE) Advanced or Proficient Level in Grade 4 Math, and, in Texas, 2011 Texas Assessment of Knowledge and Skills (TAKS) Reading Standard (Grade 4 English).

Table 3: Student and School Characteristics by Bank in School by Study Location

	No Bank	School Bank	Diff.	Obs
Wisconsin				
Student Survey				
Are you banked?	0.609	0.781	-0.173***	646
Does your school let kids save?	0.056	0.859	-0.804***	567
Do you save at school?	0.296	0.447	-0.151	358
Do you receive an allowance?	0.635	0.578	0.057	619
Kids Save	4.353	4.383	-0.030	648
Kids Bank	4.056	4.342	-0.285***	650
Financial Literacy Score (Summed)	6.655	6.953	-0.298	650
Financial Literacy Score (IRT)	52.257	53.032	-0.775	650
School Data				
Minority	20.161	16.994	3.167***	650
Free/Reduced Lunch	51.679	38.704	12.976***	650
Meet State Math Standards	80.767	80.850	-.083	650
Meet State Reading Standards	81.482	83.071	-1.600**	650
Texas				
Student Survey				
Are you banked?	0.263	0.517	-0.253***	635
Does your school let kids save?	0.096	0.934	-0.838***	514
Do you save at school?	0.349	0.357	-0.008	259
Do you receive an allowance?	0.559	0.622	-0.062	609
Kids Save	4.165	4.131	0.034	635
Kids Bank	3.770	3.971	-0.201*	635
Financial Literacy Score (Summed)	5.625	6.079	-0.454**	635
Financial Literacy Score (IRT)	44.489	45.946	-1.457**	635
School Data				
Minority	55.856	62.397	-6.542***	635
Free/Reduced Lunch	64.626	72.793	-8.167***	635
Meet State Math Standards	90.851	92.021	-1.170*	609
Meet State Reading Standards	89.785	88.750	1.035	635

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

{T3}

Student Data is from the 2012 and 2013 Eau Claire Student Survey for Wisconsin and 2013 Student Survey for Texas collected at baseline. School Data is from Department of Public Instruction District and School Performance Reports from 2011-2012 and 2012-2013 academic years for Wisconsin and 2011 Amarillo Independent School District Administrative Data for Texas. The unit of observation is a student. For detailed variable definitions see Table 1 and Table 2. The Happy State Bank Kids' Bank Program in Amarillo, Texas was randomized at the school-level. The Royal Credit Union School $ense program predates this study.

Table 4: Student and School Characteristics by Seed Deposit Assignment (Only Texas Locations with Banks in School)

	No Seed	Receive Seed	Diff.	N
Student Survey				
Are you banked?	0.433	0.573	-0.140**	240
Does your school let kids save?	0.930	0.937	-0.007	213
Do you save at school?	0.278	0.410	-0.132*	196
Do you receive an allowance?	0.602	0.635	-0.033	230
Kids Save	4.088	4.161	-0.073	240
Kids Bank	3.908	4.014	-0.106	240
Financial Literacy Score (Summed)	6.093	6.070	0.023	240
Financial Literacy Score (IRT)	46.381	45.650	0.731	240
School Data				
Minority	62.672	62.211	0.461	240
Free/Reduced Lunch	72.995	72.655	0.340	240
Meet State Math Standards	91.546	92.343	-0.796	240
Meet State Reading Standards	88.649	88.818	-0.169	240

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

{T4}

The data is from 2013 Student Survey for Texas collected at baseline and 2011 Amarillo Independent School District Administrative Data. The unit of observation is a student. Sample restricted to students in the Texas sample who have a Happy State Bank Kids' Bank program in their school. Seed deposit of $25 randomly assigned at the student-level conditional on their school starting the Kids' Bank Program. For detailed variable definitions Table 1 and Table 2.

Table 5: Student Reports Having Bank Account: OLS and Probit Estimates

	(1) Banked) (OLS)	(2) Banked (Marginal)	(3) Banked (OLS)	(4) Banked (OLS)
Bank in School	0.349***	0.344***	0.205***	0.337***
	(0.039)	(0.037)	(0.048)	(0.054)
Assigned Seed Deposit				0.148***
				(0.047)
School Controls	Yes	Yes	Yes	Yes
Sample Restriction	None	None	WI Only	TX Only
Mean	0.647		0.805	0.479
Standard Deviation	0.478		0.397	0.500
F-Stat	39.186		8.130	23.016
Observations	1259	1259	650	609

Standard errors in parentheses. Standard errors clustered at school-level.

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

{T5}

The table shows OLS and probit estimates of the instruments, bank in school program and seed deposit assignment, on banking status, using Equation . Columns 1 and 2 include both Wisconsin and Texas sample, Column 3 includes only the Wisconsin sample, and Column 4 includes only the Texas sample. Column 2 reports marginal effects from the probit model. The dependent variable *Banked* is an indicator for whether the student reports that they are banked (at their school or an outside financial institution) in the follow-up survey. Student report supplemented with parent survey (Wisconsin only) and bank account administrative data where available to correct for measurement error. *Bank in School* is an indicator variable for whether the school has a banking program. *Assigned Seed Deposit* is an indicator variable for whether the student was assigned a $25 seed deposit to open an account at their school bank program. All regressions include school-level control variables: share of minority students, share of free/reduced lunch program eligible students, share of students who met state standardized reading standard, and share of student who met state standardized math standard.

Table 6: OLS Estimates for Financial Education and Bank in School on Changes in Student Banked, Attitudes, Allowance Receipt and Financial Literacy Score: Pooled Across both Study Locations

	(1) Banked	(2) Kids Save	(3) Kids Bank	(4) Report Allowance	(5) Summed Score	(6) IRT Score
Financial Education × Bank in School	-0.010	0.007	-0.033	-0.001	0.296	1.465
	(0.042)	(0.118)	(0.143)	(0.047)	(0.346)	(1.415)
Financial Education	0.006	0.020	0.089	0.006	1.593***	8.642***
	(0.033)	(0.091)	(0.086)	(0.036)	(0.258)	(1.038)
Bank in School	0.223***	0.039	0.216*	0.007	-0.118	-0.292
	(0.037)	(0.091)	(0.117)	(0.040)	(0.221)	(1.043)
School Controls	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Control	Yes	Yes	Yes	Yes	Yes	Yes
Mean	0.647	4.428	4.219	0.613	7.667	55.757
Standard Deviation	0.478	0.939	1.102	0.487	2.761	11.751
Observations	1250	1207	1205	1212	1231	1231

Standard errors in parentheses. Standard errors clustered at school-level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

{T9}

This table shows OLS estimates of student banking status, financial education, and an interaction between banking status and financial education on changes in student attitudes, allowance receipt, and financial knowledge over the study period. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; (4) summed financial literacy score; and (5) item-response theory financial literacy score (see Table 14 for details). *Financial Education × Bank in School* is an interaction between an indicator for whether the student receives financial education and an indicator for whether the student has a bank in school program in their school. *Financial Education* is an indicator variable for whether a student receives financial education, random assignment by classroom. *Bank in School* is an indicator variable for whether a student has a bank in school program at their school, random assignment by school in Texas only. All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students from both Wisconsin and Texas.

Table 7: OLS Estimates for Student Banked on Changes in Student Attitudes Toward Banks and Allowance Receipt in Wisconsin

	(1) Kids Save	(2) Kids Bank	(3) Report Allowance	(4) Summed Score	(5) IRT Score
Banked	0.070	0.339**	0.095**	0.465	2.396
	(0.112)	(0.147)	(0.039)	(0.297)	(1.453)
School Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes
Mean	4.524	4.374	0.606	8.071	58.950
Standard Deviation	0.828	0.947	0.489	2.674	11.431
Observations	620	620	620	635	635

Standard errors in parentheses. Standard errors clustered at school-level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

{T6}

This table shows OLS estimates of student banking status on changes in student attitudes, allowance receipt, and financial knowledge over the study period. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; (4) summed financial literacy score; and (5) item-response theory financial literacy score (see Table 14 for details). All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students in Wisconsin only.

Table 8: OLS Estimates for Student Banked on Changes in Student Attitudes Toward Banks and Allowance Receipt in Texas

	(1) Kids Save	(2) Kids Bank	(3) Report Allowance	(4) Summed Score	(5) IRT Score
Banked	0.212***	0.423***	0.078**	0.414*	1.926
	(0.074)	(0.092)	(0.030)	(0.243)	(1.192)
School Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes
Mean	4.323	4.047	0.616	7.230	52.336
Standard Deviation	1.040	1.230	0.487	2.786	11.135
Observations	592	590	597	601	601

Standard errors in parentheses. Standard errors clustered at school-level.

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

{T7}

This table shows OLS estimates of student banking status on changes in student attitudes, allowance receipt, and financial knowledge over the study period. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; (4) summed financial literacy score; and (5) item-response theory financial literacy score (see Table 14 for details). All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table **??** for details). Includes students in Texas only.

Table 9: OLS Estimates for Student Banked on Changes in Student Attitudes Toward Banks and Allowance Receipt: Pooled Across both Study Locations

	Kids Save	Kids Bank	Report Allowance	Summed Score	IRT Score
Banked	0.165**	0.388***	0.087***	0.432**	2.204**
	(0.065)	(0.078)	(0.022)	(0.213)	(1.019)
School Controls	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes
Pooled Sample	Yes	Yes	Yes	Yes	Yes
Mean	4.426	4.215	0.611	7.662	55.734
Standard Deviation	0.943	1.106	0.488	2.760	11.758
Observations	1212	1210	1217	1236	1236

Standard errors in parentheses. Standard errors clustered at school-level.

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

{T8}

This table shows OLS estimates of student banking status on changes in student attitudes, allowance receipt, and financial knowledge over the study period. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; (4) summed financial literacy score; and (5) item-response theory financial literacy score (see Table 14 for details). All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students from both Wisconsin and Texas.

Table 10: IV Estimates for Student Banked on Changes in Attitudes, Allowance Receipt and Financial Literacy Score: Pooled Across both Study Locations, Bank in School as Instrument

	(1) Kids Save	(2) Kids Bank	(3) Report Allowance	(4) IRT Score
Banked (IV)	0.134	0.617***	0.020	1.446
	(0.162)	(0.210)	(0.066)	(3.544)
School Controls	Yes	Yes	Yes	Yes
Baseline Control	Yes	Yes	Yes	Yes
Mean	4.426	4.215	0.611	55.734
Standard Deviation	0.943	1.106	0.488	11.758
Observations	1212	1210	1217	1236

Standard errors in parentheses. Standard errors clustered at school-level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

{T10}

This table shows second stage estimates from the instrumental variables approach of student banking status on attitudes towards saving and banks, allowance receipt, and financial knowledge. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; and (4) item-response theory financial literacy score (see Table 14 for details). The instrumental variable used to predict banking status is bank in school program. All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students from both Wisconsin and Texas.

Table 11: IV Estimates for Student Banked on Changes in Attitudes, Allowance Receipt and Financial Literacy Score: Wisconsin Only, Bank in School as Instrument

	(1) Kids Save	(2) Kids Bank	(3) Report Allowance	(4) IRT Score
Banked (IV)	-0.377	-0.650	-0.220	1.380
	(0.442)	(0.820)	(0.199)	(9.135)
School Controls	Yes	Yes	Yes	Yes
Baseline Control	Yes	Yes	Yes	Yes
Mean	4.524	4.374	0.606	58.950
Standard Deviation	0.828	0.947	0.489	11.431
Observations	620	620	620	635

Standard errors in parentheses. Standard errors clustered at school-level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

{T11}

This table shows second stage estimates from the instrumental variables approach of student banking status on attitudes towards saving and banks, allowance receipt, and financial knowledge. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; and (4) item-response theory financial literacy score (see Table 14 for details). The instrumental variable used to predict banking status is bank in school program. All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students in Wisconsin only.

Table 12: IV Estimates for Student Banked on Changes in Attitudes, Allowance Receipt and Financial Literacy Score: Texas Only, Seed Deposit and Bank in School as Instrument

	(1) Kids Save	(2) Kids Bank	(3) Report Allowance	(4) IRT Score
Banked (IV)	0.209	1.051***	0.215***	1.567
	(0.222)	(0.192)	(0.069)	(4.289)
School Controls	Yes	Yes	Yes	Yes
Baseline Control	Yes	Yes	Yes	Yes
Mean	4.323	4.047	0.616	52.336
Standard Deviation	1.040	1.230	0.487	11.135
Observations	592	590	597	601

Standard errors in parentheses. Standard errors clustered at school-level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

{T12}

This table shows second stage estimates from the instrumental variables approach of student banking status on attitudes towards saving and banks, allowance receipt, and financial knowledge. The dependent variable, column by column, is (1) attitude towards children saving; (2) attitude towards children banking; (3) receipt of an allowance; and (4) item-response theory financial literacy score (see Table 14 for details). The instrumental variables used to predict banking status are bank in school program and seed deposit assignment, both are randomly assigned at the school-level and student-level respectively. See Table 5, Column 4 for first stage estimates. All regressions include a control for the baseline report for each dependent variable and school-level control variables (see Table 5 for details). Includes students in Texas only.

Appendix

{appendix}

Table 13: Verifying Student Reports of Banking and Saving at School with Bank Account Administrative Data

{T13}

	School-based Bank Account		
Student Reported	No	Yes	Total
Having Bank Account			
No	462	45(4%)	507
Yes	426	316(96%)	742
Total	888	361	1249
Saved at School			
No	265(82%)	93	358
Yes	58(18%)	192	250
Total	323	285	608

Data is from the Royal Credit Union Account Administrative Data, Happy State Bank Account Administrative Data, the 2012 and 2013 Student Surveys for Wisconsin and Texas collected at endline. The unit of observation is a student. The top panel shows the number of students who report that they have a bank account at endline survey (*Student Report Bank Account*) versus whether students have an account at the bank in school (*School Bank Account*) in the administrative account data. The bottom panel shows the number of students who report that they save at school (*Student Report Save at School*) versus whether students have an account at the bank in school (*School Bank Account*) in the administrative account data. *Student Report Save at School* is conditional on the student reporting that they have a bank at school.

Table 14: IRT 2-Parameter Logistic Model Estimates at Baseline

{T14}

	Discrimination	Difficulty
Interest	1.212	1.082
	(0.121)	(0.092)
Opportunity cost	0.811	1.990
	(0.103)	(0.219)
Making a tradeoff	-.005	35.78
	(0.067)	(462.975)
Saving I	0.750	-0.346
	(0.083)	(0.084)
Numeracy	1.090	-0.163
	(0.104)	(0.060)
Savings plan I	0.488	-0.981
	(0.076)	(0.179)
Savings plan II	1.434	-0.004
	(0.136)	(0.050)
Long-term saving goal	1.595	-0.366
	(0.156)	(0.051)
Saving II	0.803	-0.144
	(0.089)	(0.075)
Cost-benefit	0.726	0.631
	(0.084)	(0.100)
Saving III	0.697	-0.039
	(0.080)	(0.082)
Observations		1501

Data is from the 2012 and 2013 Eau Claire Money F-I-T Student Survey for Wisconsin and 2013 Smarter Texans Save Student Survey for Texas collected at baseline. The unit of observation is a student. *Discrimination* is the discrimination parameter where a larger value indicates that the item can distinguish better between low and high levels of financial knowledge. *Difficulty* is the difficulty parameter that indicates the item location on the financial knowledge scale. A larger difficulty parameter value indicates that the item is more difficult. *Interest* is a binary variable that equals 1 if the student responds correctly to *Juan put his money in a savings account. The payment that the bank makes to Juan for the use of his money while it is deposited in the bank is called...*, 0 otherwise. *Opportunity cost* is a binary variable that equals 1 if the student responds correctly to *Shawna got $20 for her birthday. She wants to either save her money for a radio, or spend it on a shirt. If she buys the shirt, saving for the radio is her...*, 0 otherwise. *Making a tradeoff* is a binary variable that equals 1 if the student responds correctly to *Ming wanted to buy a fancy notebook for school and save her money to buy a computer. Ming decided to buy a plain notebook that is less expensive so she can save more money for the computer. Ming's decision is an example of...*, 0 otherwise. *Saving I* is a binary variable that equals 1 if the student responds correctly to *Duane earned $25 raking leaves. He spent $20 of the $25 on a video game. The $5 that he did not spend is called his...*, 0 otherwise. *Numeracy* is a binary variable that equals 1 if the student responds correctly to *Marisa had $50 in her checking account. She made a withdrawal of $10 and a deposit of $20. What is Marisa?s balance in her checking account?*, 0 otherwise. *Savings plan I* is a binary variable that equals 1 if the student responds correctly to *Janis wants to save $75 for a CD player. She plans to save $5 a month. What else does Janis need in her savings plan?*, 0 otherwise. *Savings plan II* is a binary variable that equals 1 if the student responds correctly to *Scott plans to save the same amount of money each week for 10 weeks to buy his mom a $30 necklace. How much money should Scott save each week?*, 0 otherwise. *Long-term saving goal* is a binary variable that equals 1 if the student responds correctly to *The best example of a long-term goal would be saving for a...*, 0 otherwise. *Saving II* is a binary variable that equals 1 if the student responds correctly to *Sara Wilson earns an income of $3,000 per month as an elementary school teacher. She has expenses of $2,000 each month. The amount she has left over each month is called...*, 0 otherwise. *Cost-benefit* is a binary variable that equals 1 if the student responds correctly to *The Walker family went on a summer vacation in the mountains. They must have decided that the benefits of the vacation were...*, 0 otherwise. *Saving III* is a binary variable that equals 1 if the student responds correctly to *Which one of the following families is saving money each month?*, 0 otherwise. Two items are omitted from the IRT model: (1) *A plan for managing income, spending and saving is called...*, and (2) *Imagine you open a bank account and deposit $100. The account earns 10 percent interest per year. How much would you have in the account at the end of two years?*. More details on the financial knowledge quiz items included in the appendix. Standard errors in parentheses.

Juan put his money in a savings account. The payment that the bank makes to Juan for the use of his money while it is deposited in the bank is called…

- ○ …interest
- ○ …wages
- ○ …credit
- ○ …profit
- ○ …don't know or not sure

Ming wanted to buy a fancy notebook for school and save her money to buy a computer. Ming decided to buy a plain notebook that is less expensive so she can save more money for the computer. Ming's decision is an example of…

- ○ …paying interest
- ○ …depositing money
- ○ …making a tradeoff
- ○ …choosing a service
- ○ …don't know or not sure

Duane earned $25 raking leaves. He spent $20 of the $25 on a video game. The $5 that he did not spend is called his…

- ○ …interest
- ○ …saving
- ○ …profit
- ○ …wage
- ○ …don't know or not sure

Marisa had $50 in her checking account. She made a withdrawal of $10 and a deposit of $20. What is Marisa's balance in her checking account?

- ○ $10
- ○ $20
- ○ $50
- ○ $60
- ○ Don't know or not sure

Shawna got $20 for her birthday. She wants to either save her money for a radio, or spend it on a shirt. If she buys the shirt, saving for the radio is her…

- ○ …expense
- ○ …revenue
- ○ …human capital
- ○ …opportunity cost
- ○ …don't know or not sure

Janis wants to save $75 for a CD player. She plans to save $5 a month. What else does Janis need in her savings plan?

- ○ A checking account
- ○ A certificate of deposit
- ○ The number of stores selling CD players
- ○ The number of months that she must save
- ○ Don't know or not sure

The best example of a long-term goal would be saving for a…

- ○ …video game
- ○ …birthday present
- ○ …college education
- ○ …pair of basketball shoes
- ○ …don't know or not sure

Sara Wilson earns an income of $3,000 per month as an elementary school teacher. She has expenses of $2,000 each month. The amount she has left over each month is called…

- ○ …profit
- ○ …credit
- ○ …saving
- ○ …budget
- ○ …don't know or not sure

The Walker family went on a summer vacation in the mountains. They must have decided that the benefits of the vacation were…

- ○ …greater than the cost
- ○ …less than the cost
- ○ …equal to the cost
- ○ …zero
- ○ …don't know or not sure

Scott plans to save the same amount of money each week for 10 weeks to buy his mom a $30 necklace. How much money should Scott save each week?

- ○ $1
- ○ $2
- ○ $3
- ○ $4
- ○ Don't know or not sure

A plan for managing income, spending and saving is called…

- ○ …a budget
- ○ …an investment
- ○ …a credit account
- ○ …an account balance
- ○ …don't know or not sure

Imagine you open a bank account and deposit $100. The account earns 10 percent interest per year. How much would you have in the account at the end of two years?

- ○ Exactly $102
- ○ Exactly $120
- ○ Less than $120
- ○ More than $120
- ○ Don't know or not sure

Which one of the following families is saving money each month?

- ○ The Smiths have $750 in income, and $800 in expenses
- ○ The Suiters have $1,500 in income, and $1,500 in expenses
- ○ The Wilburns have $1,000 in income, and $900 in expenses
- ○ The Jacksons have $1,200 in income and $1,300 in expenses
- ○ Don't know or not sure