

Financial Literacy and Banking: Findings and Implications for Economic Education¹

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Introduction

Individual financial decisions in the United States are involved with the banking industry even if an individual chooses to avoid banking institutions altogether. These banking relationships are significant for several reasons. Individuals with traditional transaction accounts are found to have higher levels of savings than their unbanked counterparts. Not only do bank accounts promote increased saving, they often offer check cashing and bill paying services at a lower cost than alternative financial products, such as non-bank money orders (or bill pay) and non-bank check cashing services. For most households, it would seem impossible not to have a transaction account to make day-to-day financial payments, obtain cash for purchases, or deposit a paycheck and other checks, but 7.5 percent of U.S. households do not have checking or savings accounts. In addition to households that avoid traditional banking services, there are households that have bank account, but do not use the services the bank account provides, and instead find more costly alternatives. Approximately 18 percent of households fall into the category of being *underbanked*. Underbanked households receive the benefits of a transaction account, although they resort to other sources for many of the supplementary services that they are already paying for, such as money orders or check cashing services. This behavior warrants further discussion due to the additional costs incurred by the supplemental services.

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Many households will frequently use non-bank money orders or check cashing services, which is particularly concerning. Most traditional transaction accounts include checks or a debit card as a form of payment method from the account. The use of non-bank money orders indicates these households are not fully aware of the services an account offers. As mentioned, the fees on check-cashing can be a significant portion of a household's income if used frequently on a reoccurring basis; most banking institutions offer free, check-cashing services to customers, and then encourage direct deposit. Other services used to determine a household's underbanked status include the use of non-bank short term loans, and related services, such as payday loans, pawnshops, tax anticipated refund loans, and rent-to-own services. Compared to both traditional bank loans and credit cards, these loans are less than ideal due to their high interest rates and service fees.

This study investigates why unbanked and underbanked households avoid banking institutions. The analysis uses three national data sets from recent years: the 2009 FINRA National Capabilities Survey, State-by-State (FINRA), the 2009 FDIC Survey of Unbanked and Underbanked Households (FDIC), and the 2010 Federal Reserve's Survey of Consumer Finances (SCF). The extensive information included in these data sets is especially relevant since it also provides data on the financial knowledge of households or their use of alternative services that often was not available in past studies. The analysis should help explain what these households are using to make day-to-day transactions and whether additional information and knowledge on the benefits of bank accounts can move these households toward a higher level of banking participation.

Literature Review

Current literature on banking participation has found a relatively consistent definition of an unbanked household. This group is defined as not having any type of commercial bank account, including checking and savings accounts (Grimes et al. 2010; Hogarth et al. 2005; Rhine and Greene 2006; Rhine et al. 2006; Paulson and Rhine 2008). The focus of many papers exploring banking participation has focused on demographic and socioeconomic variables. Unbanked individuals are significantly more likely to be single (Rhine and Greene 2006; Rhine et al. 2006; Hogarth, et al. 2005), Hispanic and African American (Hogarth et al. 2005; Rhine and Greene 2006; Rhine et al. 2006; Grimes, et al. 2010), increased family size/presence of dependent children (Hogarth et al. 2005; Rhine and Greene 2006) while results for gender and age results were mixed or not significant (Amuedo-Dorantes and Bansak 2006; Grimes, et al. 2010; Paulson and Rhine 2008; Rhine and Greene 2006).

Socioeconomic variables such as education, work force participation, income, and wealth have been found to be stronger than demographic variables in determining whether a household is unbanked. Education level has been tied to banking participation in nearly all current literature, those with a high school degree or less are significantly more likely to be unbanked (Hogarth et al. 2005; Grimes et al. 2010; Rhine and Greene 2006; Rhine et al. 2006). Amuedo-Dorantes and Bansak (2006) did not find education to be a significant determinant of banking participation. Unlike previous studies, they coded education as a continuous variable rather than a set of dummy variables.

Previous studies that used a dummy variable to indicate if the respondent was in the work force, and has a work commitment, have found mixed results. Hogarth et al. (2005) took a more in-depth look at work status, including working, retired, unemployed looking, and unemployed not looking. Relative to head of households who were unemployed not looking, respondents who

are working and retired are significantly more likely to be banked, while unemployed looking are more likely to be unbanked. Other studies have found the result to be not significant (Grimes et al. 2010; Rhine and Greene 2006).

Many studies have concluded that having low income is not only a significant factor effecting banking participation, but it is the primary determinant in predicting if a household is unbanked (Grimes et al. 2010; Hogarth et al. 2005; Paulson and Rhine 2008; Rhine and Greene 2006; Rhine et al. 2006). Amuedo-Dorantes and Bansak (2006) include variables for living standards rather than income, but these variables are not significant indicators of banking participation.

Researchers did not only investigate income, but a household's overall financial situation, including variables controlling for net wealth and access to credit. Results indicate that those with positive net worth (Rhine and Greene 2006; Hogarth et al. 2005), own their home (Hogarth et al. 2005; Grimes et al. 2010; Rhine et al. 2006), and own their vehicle (Hogarth et al. 2005) are significantly less likely to be unbanked. Households who have access to credit, in the form of a credit card (Grimes et al. 2010), are significantly less likely to be unbanked. Hogarth et al. measured credit in an alternative manner, looking at whether the respondent has been rejected or obtained a lesser amount of credit than requested. The results indicate that households who have been rejected or obtained a lesser amount are significantly more likely to be banked than those who have not been rejected. While this result is not expected, it may be explained by unbanked households not making an attempt to apply for credit.

Grimes et al. (2010) included a set of economic knowledge indicators in their regression analysis. First, economic literacy was measured by a set of seven questions. These questions ranged in topic from the current unemployment and inflation rates to how prices are determined in

a competitive market. The authors found that a higher scores on the set of economic knowledge questions lead to a lesser likelihood of the household being unbanked. The second method the authors used was to include indicators for courses taken in high school; including economic, business, or personal finance courses. These courses were combined into one indicator for exposure and used separately in various regression analyzes. However, only respondents who had taken at least one or more economic, business, or finance course (the combined indicator) or taken at least one business course are significantly less likely to be unbanked.

The majority of current literature is focused in the area of unbanked households. However, there is another category of individuals who do have a bank account, but like the unbanked, make costly financial decisions that warrant further investigation. The Federal Deposit Insurance Corporation (FDIC) (2009) defines an underbanked household as “those that have a checking or savings account, but rely on alternative financial services. Specifically, underbanked households have used non-bank money orders, non-bank check-cashing services, payday loans, rent-to-own agreements, or pawnshops at least once or twice a year, or refund anticipation loans at least once in the past five years.” The relative newness of the term underbanked has found an emergence of research, but still relative to the unbanked, there is a significant amount of understanding that has yet to be discovered concerning the underbanked.

Much of the research on the underbanked has focused on the specific individual alternative services. The underbanked as a whole, relative to the research completed on the unbanked, is limited. Much of the research has focused on how to reach these individuals, not necessarily the characteristics of these households (Beard 2010, Gross, et al. 2012). This paper will work to improve upon the research on the underbanked and help those targeting education programs to better understand their audience.

Data

The first data set used for this study is the Financial Capability in the United States survey created by the Financial Industry Regulatory Authority (FINRA). The State-by-State data set was chosen for this analysis due to its large number of observations, approximately 28,146 American adults. A sample of at least 500 respondents from each state and the District of Columbia was obtained by an online survey between June and October of 2009. The state data set were weighted to match Census distributions based on age by gender, race/ethnicity, and level of education (Applied Research and Consulting LLC 2009). This data set asked respondents a set of five financial literacy questions to estimate their financial understanding. The FINRA questions used to determine a household's level of financial literacy can be found in Appendix 1. Since banking participation requires a relatively low level of financial knowledge, it is expected that the respondents' score will have a small but significant effect on participation. While it is expected that financial literacy will have a small effect in general, the magnitude of the effect may get larger as we move to a comparison of the underbanked and fully banked. To be considered underbanked, a household must use alternative services from third parties that are often more costly than the same service provided from their bank. Having knowledge that these services tend to be more costly may incentivize the household to choose traditional services. In addition to the respondent's total score, individual questions, which vary in difficulty, will be explored. It is predicted that the relatively easy questions will have the greatest impact on banking participation due to a low level of financial involvement. Given the richness of the financial literacy variables, the FINRA survey will be the primary data set used in the analysis.

The second data set used to analyze differences in the characteristics across banking levels is the FDIC National Survey of Unbanked and Underbanked Households. This survey was a

supplement to the January 2009 Census Bureau's Current Population Survey (CPS). Since this data set is linked to the CPS, there is more information concerning the work status of the respondents than with the FINRA data set. The full CPS data set includes information on 54,000 households, with nearly 47,000 respondents completing the supplemental FDIC survey. While this was the number of respondents who began the survey, the number of questions in the survey varied based on the responses given. If the respondent was not aware whether the household had a checking or saving account, or refused to answer the question, the survey ended. The survey was also terminated if the respondent reported that they were "not at all" involved in making financial decisions, or that they did not know, or refused to answer, their level of participation in the decision making process. After these drops were made, the number of observations used was 45,875. All households that reported knowing whether they had a checking or saving account were included in the unbanked analysis. When analyzing data for underbanked household, surveys that were terminated due to an individual's involvement in making financial decisions were not included.

The sampling method of the CPS is complex. The first step, based on the 2000 census information, created just over 2,000 geographical areas called "primary sampling units" (PSU) for the entire United States. These PSUs are formed into strata, by themselves and within each state. A total of 842 PSUs are sampled. The second step was to choose households within these PSUs to survey. Around 72,000 households are chosen each month; however, due to unoccupied households, and those who do not respond because they are absent or refuse to answer, the data set usually falls to around 57,000 households. The CPS then collects data on the members of the household, applying household responses to all members. In a given month, information is obtained on approximately 112,000 individuals age 15 years or older, 31,000 children (0-14 years of age), and about 450 individuals in the Armed Forces.

As with most national data sets, the CPS does oversample some groups, requiring the use of weights to complete an analysis. The first weight included in the data set is the “inverse of the probability of the person being in the sample.” This weight is fairly consistent for individuals living within the same state but can differ greatly across states. The CPS also includes weight for non-interviewed households and ratio estimates. The ratio estimate is a weight that accounts for differences between the sample and the actual population. The characteristics that are considered are “age, race, sex, and state of residence.” The primary purpose of these weights is for analysis of work force participation. When looking at banking participation, the household weight will be applied to all descriptive statistics and regression analysis.

The final data set that will be used in this analysis is the 2010 Survey of Consumer Finances (SCF), which is sponsored by the Federal Reserve Board in cooperation with the Department of the Treasury. The data was collected between May and December and includes a sample size of 6,492. The purpose of the SCF is to track changes in the financial situations and participation over time. The SCF has been conducted triennially since 1983, with panel surveys being completed in 1983-1989, and 2007-2009. The purpose of the most recent panel data set was to explore the effect the current recession has had on consumer finances.

The SCF also oversamples select segments of the population to obtain a more accurate picture of the population. The sample design consists of obtaining “a standard, geographically based random sample and a special oversample of relatively wealthy families.” Keeping consistent with previous literature that has used the SCF, the descriptive statistics will be weighted, but the regression analysis will use a Repeated Imputation Inference (RII) technique that addresses the issue of missing observations. While this paper will use this method, an in-depth discussion will

not be included. For more information on the RII method, see Montalto and Sung (1996) and Kennickell (1998).

Since three data sets will be used to analyze banking participation, a comparison of variables across surveys is important to ensure that terms are well defined and discrepancies pointed out. For a complete comparison of the variables used in this paper see Appendix 1. The first important comparison to discuss is how the survey chose the respondent. For the FINRA survey the respondent was selected at random, there was no targeting of “heads of households or primary financial decision makers” (Applied Research and Consulting LLC 2009). As mentioned above, the FDIC survey is a supplement to the CPS. The “reference person” for the FDIC survey is the “person who owns or rents the home” (FDIC 2009). The SCF, like the FINRA survey, does not target the head of household, but the respondent is not chosen at random. The respondent of the SCF is the “most financially knowledgeable person in the household” (Lindamood, et al. 2007).

The variables that warrant the most discussion are the dependent variables, unbanked and underbanked. The definition of unbanked is fairly consistent across the three data sets. The FINRA data set requires two questions to determine whether the respondent is unbanked. First, they are asked if they or their household has a checking account. The second relevant question is whether they or their household has a “saving account, money market account, or CDs.” If a respondent answered yes to at least one of these questions, they are considered to be banked. If a household reported they did not know/or refused to answer one of the questions, and did not hold the other account or indicated that they did not know/or refused to answer both of the questions, they were dropped from the analysis⁴. The FDIC survey asks one question to determine the same unbanked variable. The question used is “Do you or does anyone in your household currently have a checking

⁴ Determining whether 373 households or 1.3% of households were unbanked was not possible due to don’t know/refused responses.

or saving account?” The SCF treats the banking questions similar to the FINRA data sets, asking whether the respondent had a checking account, then a saving account of some type. A difference that should be noted is the inconsistency between previous work using the SCF and this study. Previous work using the SCF has defined unbanked as not having a transaction account, including a checking account, savings or money market account, or a call account. Since the comparison to the other data sets used in this analysis is more important than comparing to previous literature, the call accounts will not be included in the definition of unbanked.⁵

The next dependent variable is whether the household is underbanked. As previously mentioned, the FDIC defines underbanked households as “those that have a checking or savings account but rely on alternative financial services. Specifically, underbanked households have used non-bank money orders, non-bank check-cashing services, payday loans, rent-to-own agreements, or pawnshops at least once or twice a year, or refund anticipation loans at least once in the past five years.” This is the definition that will be used to build the underbanked variable. Due to the newness of the definition, different questions were asked about alternative financial services used by the unbanked. This leads to slight inconsistencies in the definition.

Since the FDIC developed the definition, the FDIC survey includes all relevant questions to determine whether a household is underbanked. The difference will come in the FINRA definition of underbanked. The first discrepancy will be use of non-bank money orders and check cashing services. The FINRA survey did not ask banked households about their usage of these services, which may underestimate the number of underbanked households⁶. Another difference is the inclusion of an auto title loan. While the FDIC data set does not include this service in its

⁵ There are nine households that have call accounts, but no other transaction account. These households would be considered banked under the Hogarth, et al. (2005) definition.

⁶ If households who use solely money orders and/or check cashing services were excluded from the FDIC definition of underbanked, the percentage of banked households would fall from 20.3% to 7.0% (of banked households).

definition, it can be considered an alternative to traditional banking loans so will be included in FINRA definition of underbanked⁷. The FINRA data sets do not include information about frequency of use, leading to the final difference between definitions. Distinguishing between frequent and infrequent users is not possible, so underbanked households are those that have taken out or used these services⁸. As previously mentioned, the SCF does not include enough information to determine if a household is underbanked. The only question asked concerning alternative financial services is whether the respondent uses payday loan services. While this variable will not be used for any purpose, the descriptive statistics will be reported for comparison.

Most demographic and socioeconomic variables were found in all data sets. The data was combined in a manner that was consistent with the FINRA data sets. For example, age was included as a categorical variable in the FINRA data set, and was used for all data sets. While most of the controls were found in all surveys, there were a couple variables that were not common across data sets. Race/Ethnicity, employment status, number of credit cards, change in income, and region/geographical variables varied slightly across surveys. The maximum number of controls will be used when possible. While there are some differences across surveys, overall they are very similar, and comparisons can be made with a few notes for the variations. Using the three data sets will create stronger results due to the individual and their combined strengths.

Who are the Unbanked?

Table 1 presents the descriptive statistics from the FINRA, FDIC, and SCF, respectively. All descriptive statistics have been weighted so the results represent characteristics of the population of the United States. Previous literature indicated that the percentage of unbanked is

⁷ Excluding households who only use auto title loans from the underbanked, the percentage of underbanked households falls from 23.2% to 20.1% (of banked households).

⁸ When infrequent users of alternative services are considered underbanked, 34.2% of banked households would fall into that category, an increase of 14%. If those only using money orders and/or check cashing services are excluded, there is an increase from 7.0% to 10.7%.

around ten percent (Grimes, et al. 2010, Hogarth, et al. 1998). The FINRA data set indicates a lower percentage of unbanked, 5.3 percent, relative to previous literature and both the FDIC and the SCF, which find that 7.5 percent of households are unbanked. While the FINRA data set does report a smaller percentage of unbanked households, the percentage is still in line with the other results.

Data for the Unbanked

The FINRA and FDIC data show that a slightly higher percentage of unbanked households are female, with 51 percent and 56 percent respectively. The SCF indicates that 61 percent of unbanked households are male. This difference may be due to the differences in how the interviewee was determined. All data sets seem to follow the trend younger households compose a greater percentage of unbanked households. The strongest results come from the State survey; while the full sample has a nearly 33 percent breakdown of all age groups, exploring the age breakdown within the unbanked category, 52 percent fall into the youngest cohort and only 10 percent into the oldest.

Race/ethnicity has been found to be a significant determinant of banking participation in previous literature. One reason cited has been the language barrier (Rhine and Greene 2006). If English is not the first language, some individuals may feel uncomfortable engaging in banking services. The race/ethnicity variables vary slightly across surveys. It is expected that relative to Caucasian/white non-Hispanics respondents: African American/black, Hispanic, Native American/Alaskan, and Other (primarily those reporting more than one race) are more likely to be unbanked, while Asian respondents will be less likely. Since a larger percentage of the sample as a whole is Caucasian/white, a larger percentage of the unbanked also fall into this category. While it may be true that the majority of the data set is composed of this group, a relatively large

percentage of unbanked households also fall into the African American/black and Hispanic categories.

. A comparison of marital status indicates a greater percentage of unbanked households are single never-married, ranging from 54 percent in the FINRA survey to 40 percent in the FDIC survey. Both married and divorced/separated households represent a quarter of unbanked households each. Widows represent the smallest portion of unbanked households. One might expect the presence of children to effect banking participation. While the data sets have information on number of children as a continuous variable, researchers believe that it is the presence of at least one child that will have an impact on banking participation. For this reason, a dummy variable has been created to account for at least one dependent child being present in the household. Across all surveys, a higher percentage of unbanked households have at least one dependent child present. The FDIC survey finds the largest spread: 42 percent of unbanked households, compared to 29 percent of banked, have a dependent child present.

Whether or not individuals are banked will likely be affected by their education level as well. As education increases, it is hypothesized that an individual will become more aware of the additional expenses associated with not having an account, decreasing their use of alternative services and, in turn, increasing their banking participation. When looking at the mean difference comparison, the initial hypothesis is confirmed. Those with a high school degree or less are significantly more likely to be unbanked, while those with some college or more are significantly more likely to be banked. These results are consistent across all surveys.

Employment status of unbanked households is also of interest, exploring the results of the three data sets shows consistent results. Across all surveys, respondents who are employed full-

time, self-employed, or retired represent a higher percentage of banked households, while those who are employed part-time, homemakers, disabled, or unemployed are unbanked.

Income is expected to be one of the most significant determinants of being unbanked. It is expected that, relative to middle income, lower income households will be more likely to be unbanked. Across all data sets, the percentage of unbanked households that fall into the lowest income category range from 85 percent to 89 percent. Not only is the level of income expected to influence banking participation, but also changes in income. If a household has experienced a decrease in income, it is also to be an important indicator of whether a household is unbanked. It is expected that households which experienced a fall in income would be less likely to meet minimum balance requirements and therefore, less likely to hold a transaction account. Both the FINRA and SCF exhibit difference between the percentage of unbanked and banked households who report experiencing a drop in income. The FINRA survey shows that 56 percent of unbanked households experience a drop in income, while only 40 percent of banked households report the same.

Financial Literacy: Unbanked

The next set of variables that are of interest to this study are indicators for the household's access to credit and their level of assets. The first variable of this subset is a dummy variable for whether or not respondents own their residence. The breakdown between levels of banking indicates a higher percentage of banked households are homeowners. Using the FINRA data, only 17 percent of unbanked households own a home, compared to 62 percent of banked households; the FDIC and SCF report results of similar magnitude. Credit card ownership is also of interest when exploring banking participation, only a small percentage of the unbanked hold at least one credit card. Only Twenty percent of unbanked households, compared to 78 percent of banked

households, hold at least one credit card in the FINRA data set. Results are even stronger using the SCF data, only 10 percent of unbanked households report having at least one credit card, while 73 percent of banked households do.

Statistics on financial literacy, and the full sample and a breakdown between participation levels can be found in Table 2. The average number of questions answered correctly by a respondent was three, with the difference between the number of questions answered correctly by the unbanked and banked being significantly different. Unbanked respondents, on average, answered two questions correctly, while banked respondents answered three correct. The number of don't know/refused responses are also of note because it is an indicator of the respondent acknowledging they are not financially knowledgeable about the specific topic. This should be differentiated from respondents who answered incorrectly. On average, unbanked households responded don't know/refused slightly more often, but the difference is not large in magnitude.

Not only is it important to look at the financial literacy score as an aggregate, but individually as well. The third question, the bond question, is the most difficult, with only 29 percent of all respondents answering correctly. It was also the question where the most individuals reported they "did not know" the answer. The fourth question concerns length of a mortgage and the principal payments and total amount of the loan. This question has the highest percentage of all respondents answering it correctly, 78 percent. The mortgage question exhibits the greatest difference, with nearly a 28 percent difference in the percent of unbanked who answered it correctly relative to the banked. The inflation and stock diversification questions also had differences in excess of 20 percent. It is expected that these questions will be significant determinants of the banked in the regression analysis.

Probit Results: Unbanked

A dummy variable was created to indicate whether a household is unbanked, equal to 1 if the household does not have a checking or savings account, and 0 otherwise. Demographic variables have been found to vary across banking participation levels; other research has introduced economic knowledge and education into the determinants. Various models will be used in this section, but will have the general form:

$$unbanked = f(\text{demographics}, \text{socioeconomics}, \text{financial knowledge})$$

The first set of regressions includes controls for demographic and socioeconomic characteristics, as well as the respondents' access to credit and assets. The basic model contains a fairly consistent set of variables included in all three surveys. The results for these regressions can be seen in Table 3.

The results seem to indicate that females are less likely to be unbanked, relative to males. The results are only significant for the FDIC data set. This may be a result of a difference in the role of the respondent in the household. The FINRA survey asked to speak with the individual in the household whose birthday was closest, so any significance would be described as differences in reporting; women respond differently than males to the banking questions. Since the results are not significant, it appears that women are not more likely to report being unbanked than men. The FDIC questions the head of household, the fact that gender does play a significant role in these cases is more interesting than the FINRA results, due to the differences in the way the respondent was chosen. While these results are significant the results are small in magnitude, less than a one percentage point difference.

It was expected that as age increased, finances became more complex, and the need for an account increased. The result for this variable is consistent across surveys: the oldest households are significantly less likely to be unbanked, relative to those in the middle cohort. This result is

significant, but not as large in magnitude as expected, as those in the oldest cohort are approximately one percentage point less likely to be unbanked, relative to those in the middle cohort.

Race was also found to be a significant determinant of banking participation. Consistent across all data sets, relative to Caucasian/whites respondents, African American/black and Hispanic households were more likely to be unbanked, with the result being significant in most cases. While the results are similar in sign across the surveys, the magnitude varies slightly. The FDIC analysis indicates that African Americans/blacks are five percentage points more likely to be unbanked and Hispanics are three. The FINRA and SCF percentages are closer to one percentage point.

Banking participation is also expected to be influenced by family composition, including marital status and presence of dependent children. The mean comparison indicated that a higher percentage of married households were banked. These results only follow through to the probit analysis. Results for all data sets indicate that single, never-married and divorced/separated households are significantly more likely to unbanked. Including an indicator for dependent children present in the household resulted in a significantly positive coefficient. This effect may explained by the additional expenses children bring to a household. With these additional expenses, households may be unable to meet the minimum requirements, or lack the funds to hold a bank account. It is also possible that the presence of children makes traditional banking more inconvenient than the alternatives.

Education was expected to have a strong influence on the level of banking participation. It was expected that increases in education lead to higher incomes and more complex finances and additional knowledge that may lead to increased bank participation. This expectation was

confirmed by all three data sets, which find the levels of education to be significantly associated with banking participation. Those with less than a high school degree, relative to respondents with a high school degree, were two percentage points more likely to be unbanked. A respondent with some college education, or greater, is one to two percentage points less likely to be unbanked, relative to a high school graduate.

A comparison of means indicated that full-time workers would more likely be banked. This regression omitted the full time dummy variable, so results are reported relative to full-time workers. Because the variables are coded in this manner, the expected sign is positive, indicating a greater likelihood of being unbanked for other work statuses. The FINRA and SCF results are the expected sign, with most positive or near zero. The coefficients on unemployed respondents are large in magnitude and significance. Unemployed households are nearly three percentage points more likely to be unbanked, relative to those with a full-time position. The coefficients on the retirement indicator are significant for the FDIC, these respondents are significantly less likely to be unbanked. Due to their complex finances and the federal government pushing for direct deposits for transfer payments, it is expected most retired households would be banked.

A set of income variables are the next controls included in the regression analysis, both income level and changes in income (when available) were included. As with previous literature, income coefficients are relatively large and significant. It was expected that income would be a primary motivator of whether a household held a transaction account. This result was confirmed by all studies: low income households are significantly more likely to be unbanked. Both the FDIC and SCF also find that those that fall into the highest income bracket are significantly less likely to be unbanked; the result was near 0 and insignificant in the FINRA analysis. Change in income

does not have as strong of an effect; this may be due to the correlation with the unemployed variable.

The final set of variables included in this regression set is controls for a household's access to credit and assets. Homeowners are significantly less likely to be unbanked in both the FINRA and FDIC analysis. This was expected since homeownership generally requires some interaction with financial institutions and is an indicator of wealth. A homeowner is two percentage points less likely to be unbanked; this result is similar in magnitude and significant across all surveys. It was also expected credit cards would lead to a less likelihood of being unbanked, since acquiring that form of credit typically requires an account and creates a greater need for the account. The FINRA and SCF both find that respondents holding at least one credit card are four percentage points less likely to be unbanked.

Table 4 analysis includes the set of financial literacy controls. The regression results for a respondent's total score are presented in Column I. The more questions the respondent answered correctly, the less likely the household was unbanked. While this result is significant, it is not large in magnitude. The second method for incorporating financial literacy is to analyze each question individually, but in a single regression. These variables are coded similar to the first regression, but the results are not aggregated, and are instead used as separate indicators. It was expected; because banking represents a low level of financial involvement, it is expected that relatively easy questions will have the strongest effect on banking participation. All questions, with the exception of the question on the relationship between bond prices and interest rates, are the expected signs and significant. The coefficients are not large in magnitude, but this may be a result of the correlation between questions.⁹

⁹ Correlations between questions range from 0.13 to 0.36.

The final set of financial literacy regressions includes each question separately, with results found in Columns III to VIII. Indicators for whether respondents answered the question correctly or gave a “don’t know” answer are included. Results are presented relative to those who answered the question incorrectly. The expected sign of answering a given question correctly is negative, meaning those households are less likely to be unbanked. This result is found across all questions, except the bond price question which has a coefficient of zero. The results are also significant: answering the question correctly leads to a nearly one percentage point decrease in the likelihood the household is unbanked. While these results do not appear to be large in magnitude, they are in line with other strong indicators of banking participation.

Who are the Underbanked?

The sample size for the underbanked analysis will not match the unbanked analysis because the level of participation within the banked households is unknown for some respondents. Those individuals who do not know or refused to disclose their level of participation, or for which the survey was terminated before their status was determined, were dropped.¹⁰ For the FINRA data set, this change decreases the sample size from 26,544 to 26,146 households, of which 22 percent are underbanked. The FDIC data finds that 20 percent of banked households are underbanked. The sample size using the FDIC sample has decreased to 41,813 households, from 43,514. The SCF will be omitted from this analysis because it has no information to define the underbanked.

Data for the Underbanked

Table 5 presents the descriptive statistics for the FINRA and FDIC for the sample of banked households and a breakdown of the underbanked and fully banked. Age is a demographic variable

¹⁰ Households who answered ‘yes’ to at least one alternative service are considered underbanked, even if they did not know/refused other services. If the respondent answered they did not use any of the alternatives but didn’t respond or refused one question they were dropped from the analysis.

that affected banking participation at the unbanked/banked level; it is hypothesized that this trend will follow to the underbanked analysis. Both the FINRA and FDIC data sets show a trend of greater banking participation as age increases. There are a higher percentage of young and middle age adults who are underbanked, while the reverse is true for the older cohort.

The mean comparison of the race/ethnicity variables when looking at unbanked to the banked was highly significant. The differences are not as clear for the comparison of the underbanked to the fully banked. Both the FINRA and FDIC survey indicate that Caucasian/white and Asian respondents represent a significantly higher percentage of fully banked households. Respondents who are African American/black, Hispanic, Native American/Alaskan, and respondents who report multiple races/ethnicity, compose a higher percentage of underbanked households. The most drastic result is for African American respondents who make up just fewer than 10 percent of all banked respondents. When looking at race and banking participation, Blacks are representative of nearly 20 percent of underbanked households and less than ten percent of fully banked households.

Similar to the unbanked results, both single never-married and divorced/separated households, and those where dependent children are present represent a significantly greater percentage of underbanked households. Married households and widowed households make up a greater percentage of fully banked households. The FINRA and FDIC indicate that 53 percent and 36 percent of underbanked households report having at least one dependent child present, respectively.

As with the unbanked, it is expected that underbanked households will be less educated than fully banked households. The results are as expected for respondents with a college degree or higher: they are significantly more likely to be fully banked. The FDIC data indicates that both

those with less than a high school degree, and those that hold a high school degree or equivalent, are more likely to be underbanked.

It is expected, based on the majority of services that define the underbanked, the primary reason underbanked households use alternative services is to meet short-term debt obligations. Respondents who are unemployed or disabled may be more likely to need the additional money to meet these needs. Both sets of data confirm this hypothesis. Unemployed households make up five percent of all banked households in the FDIC survey. When breaking down the banked category to underbanked and fully banked households, unemployed respondents represent eight percent of the underbanked. The reverse is true for respondents: the FINRA results show retired respondents make up only eight percent of the underbanked, but over 20 percent of the fully banked.

A household's level of income was expected to be the primary determinant of whether the household had a transaction account. Unlike the unbanked, it is expected that experiencing a drop in income will have a larger effect on whether a respondent is underbanked. Both the FINRA and FDIC results show significant differences in the mean percentage of households who are underbanked versus those fully banked for the lowest and highest income levels in the expected directions. An indicator for "drop in income" is included in the FINRA analysis. Results show that 54 percent of underbanked households have experienced an unexpected drop in income, while only 35 percent of their fully banked counterparts have experienced a similar change in income.

Access to credit and level of assets are also expected to have an effect on whether or not a household chooses to use alternative financial services in addition to traditional bank accounts. The FDIC data indicates that 53 percent of underbanked households are homeowners, compared to 77 percent of fully banked households. These results are slightly different in magnitude, but confirmed with the FINRA data. The FINRA results also explore the use of credit

cards by the two groups: 61 percent of underbanked households have at least one credit card, while 84 percent of fully banked households have at least one credit card.

Financial Literacy: Underbanked

Using alternative financial services can be very costly, and it is a more complex decision than the initial one to open an account. For this reason, it is projected that financial knowledge will have a greater effect on the decision to be underbanked. It is the lack of funds to meet current debt obligations that is predicted to be the primary reason a household is underbanked. If mismanagement of money is the reason these households are unable to meet their debt obligations, financial education could improve these outcomes.

Table 6 shows the descriptive statistics for the financial literacy variables among the underbanked and fully banked subsets. Observing the first indicator of financial literacy (the number of correct answers given on the set of five questions) indicates a significant gap between the underbanked and the fully banked households. Underbanked households answer an average of 2.7 questions correctly while fully banked households answer 3.2 correct. Underbanked respondents were also slightly more likely to respond “don’t know/refuse” as a response.

A greater proportion of the fully banked households answered all individual questions correctly, relative to underbanked households. The inflation and stock diversification questions have the largest difference between the percentages of underbanked who answered correctly compared to fully banked, with a spread of 13 percent. This is particularly alarming since these are relatively easy questions. The bond price question was the most difficult question, and there is six percent difference in the number of underbanked and fully banked households that answered the question correctly. It is hypothesized that relatively difficult questions will be better at

differentiating between the underbanked and fully banked respondents, compared to easier questions.

Probit Results

Table 7 reports the probit results for the FINRA and FDIC data sets. The dependent variable, *underbanked*, is a dummy variable equal to one if the household uses at least one alternative banking service. If the household has not utilized one of these services the variable is made equal to zero. The general model that will be explored is

$$\textit{underbanked} = f(\textit{demographics}, \textit{socioeconomics}, \textit{financial knowledge})$$

The FINRA results show that females are significantly less likely to be underbanked, but the coefficient is not large in magnitude. This result is consistent with the FDIC survey, but the result is no longer significant.

The expectations of age on banking participation were confirmed. Looking at the FINRA data, young respondents are four percentage points more likely to be underbanked, relative to those in the middle aged cohort. As was expected, respondents in the oldest cohort were nearly seven percentage points less likely to be underbanked. The FDIC results tell a similar story, but the coefficients are not as large in magnitude and only the oldest cohort effect is significant.

The effect of race/ethnicity is much larger than expected: the FINRA and FDIC results report African Americans/blacks respondents, relative to Caucasian/whites, are ten and 21 percentage points more likely to be underbanked, respectively. These results are significant at the one percent level. The Native American/Alaskan effect is also large in magnitude: the FDIC results indicate this group is 19 percentage points more likely to be underbanked. Hispanics are also significantly more likely to be underbanked, but the result is not as large in magnitude as the previous race variables. While these races/ethnicities are significantly more likely to be

underbanked, the reverse is true for Asians. Asians are significantly less likely to be underbanked, ten percentage points less likely using the FDIC data.

The effect of marital status is not very strong and inconsistent across surveys. The dependent children variable is significant and relatively large in magnitude. Household where dependent children are present are nine and four percentage points more likely to be underbanked.

Education was also predicted to be a significant determinant of whether or not a household was underbanked. As education increases an individual is expected to use fewer alternative financial services. The results found in both the FINRA and FDIC analysis confirm this hypothesis. Those who have less than a high school degree are more likely to be underbanked, relative to those with a high school degree or equivalent; however, the result is only significant in the FIDC regression. For all levels of education above a high school degree, respondents are less likely to be underbanked. Having some college education decreases the likelihood of being underbanked, and respondents with a college degree or higher are ten percentage points less likely to be underbanked.

It was anticipated that since the majority of services that define the underbanked are related to short term loans, those who are unemployed and temporarily disabled may be more likely to fall into this category. This prediction is confirmed by the FDIC analysis. Relative to respondents employed full time, those who are unemployed are six percentage points more likely to be underbanked while those who are disabled are five percentage points more likely. The conflicting result comes from the FINRA survey. Results confirm that disabled respondents are more likely to be underbanked, but unemployed households are two percentage points less likely to be underbanked. While this result was not expected, it may be explained by the inclusion of the drop in income variable. Households who have experienced an unexpected drop in income are eight

percentage points more likely to be underbanked. Due to the correlation between these variables, the change in income variable may take away some of the explanatory power of unemployment.¹¹

While income was expected to have a large effect on whether a household had a transaction account, it is not expected to be as strong of a determinant in whether the household is underbanked. Although the prediction was income would not have as large of an effect, the results are still significant and in the expected direction. Households in the lowest income bracket are two percentage points more likely to be underbanked, while those in the highest bracket are eight and five percentage points less likely to be underbanked, in the FINRA and FDIC analysis, respectively.

The final controls in the first set regression are indicators for assets and credit. Homeownership and holding at least one credit card are both negatively associated with being underbanked. A homeowner is nearly ten percentage points less likely to be underbanked in both the FINRA and FDIC data. This is the expected result due to the fact that homeowners have access to more affordable short term loan options, such as a home equity loan. Households that have at least one credit card are seven percentage points less likely to be underbanked. This was the hypothesized result because credit cards are substitutes for many of the alternative loans that define the underbanked.

Table 8 shows the effect financial literacy has on the banking status of households with transaction accounts. The first regression includes financial literacy as the number of questions answered correctly out of a set of five. This result is significant and in the expected direction: the higher number of questions answered correctly, the less likely the household is underbanked. The inclusion of the financial knowledge variable leads to some changes in the demographic and

¹¹ The coefficient on unemployed becomes positive if the control for a household experiencing a drop in income is not included in the regression.

socioeconomic controls: slightly decreasing the impact of race/ethnicity variables. While this result was unexpected, it suggests that race alone is not the main determinant of whether or not a household uses the alternative services. The change in income variable is still a significant indicator and remains relatively large in magnitude.

The second regression separates the questions into individual controls to determine the impact of each question on its own. All coefficients are in the expected direction and most are significant. The largest effect comes from the inflation and stock diversification questions, which had the largest spread in the mean comparison of the underbanked and fully banked. The results show that if respondents answered the inflation and stock diversification questions correctly, they are three percentage points, and two percentage points less likely to be underbanked, respectively.

The final set of regressions includes each question separately. An indicator for whether the respondent answered the question correctly and “don’t know/refused to answer” are included, with the omitted group responding incorrectly. Results show that all signs on the coefficients for answering the questions correctly are significant and in the expected direction. The question with the largest impact is the stock diversification question. Answering that question correctly leads to a seven percentage points decrease in likelihood the respondent is underbanked. Another interesting result from these regressions is the sign and significance of the coefficients on the “don’t know/refused” responses. Those who responded they did not know, or who refused to answer the financial literacy questions, are significantly less likely to be underbanked, in all cases. This result may indicate those households who recognize they have a low level of financial knowledge are choosing to be fully banked, while those who inaccurately believe they have financial knowledge are making less than ideal financial decisions.

Conclusion

Most of the current financial education is targeted to individuals based on life events. The results from this research suggests new possibilities for targeting education based on the reason a household has a low level of banking participation. For example, African American/Black respondents were significantly more likely to state they did not have a transaction account because they did not have enough money. In 2009 the number of free checking accounts was at its peak, meaning little to no money was needed to open and maintain an account (Bruce 2009). Focusing education on the cost of transaction accounts to these individuals may be the most beneficial way to ensure they are making a decision that will bring them toward their highest level of financial wellbeing.

For the underbanked, it is a matter of exploring why they are using alternative financial services. Unlike the abundance of private, public, and government education focused on traditional banking services, these same entities do not provide extensive education on the alternative services. The need to use these banking alternatives primarily stems from the need to meet basic living expenses. Education and information on creating a budget, and encouraging discussion of the difference between wants and needs are important for households to consider when they plan their monthly expenses. This information is particularly important for the unemployed and households experiencing a large drop in income. Offering information targeted to these individuals may improve their financial wellbeing.

Banks must also overcome the lack of awareness some low banking participation households retain about their services. For example, some of these households believe banks do not offer money orders. And while this may be true, the fact that checks can be used as alternatives to money orders, in most cases, can offer an alternative way to pay their bills. Others do not believe that banks had small dollar loans that could be borrowed for a short period of time. If a bank or

credit union offers an alternative to a payday, pawn shop, or other small dollar loan, providing information on these services could increase banking participation.

The issue of unbanked and underbanked participation will likely persist over time, with fluctuations in the business cycle and technological advances in banking services. Ongoing research on the decisions of these households and the effectiveness of regulation and education programs targeted at improving banking participation can offer greater insight into the problem. The research discussed above is important to conduct, because improving banking participation within these households will promote increased financial well-being among the unbanked and underbanked.

| Table 1: Unbanked and Banked Characteristics | | | | | | |
|---|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|
| | FINRA | | FDIC | | SCF | |
| Proportion of Unbanked in Sample | 0.0527 | | 0.0747 | | 0.0750 | |
| | Proportion Unbanked | Proportion Banked | Proportion Unbanked | Proportion Banked | Proportion Unbanked | Proportion Banked |
| Female | 0.5137 | 0.5121 | 0.5620 | 0.4831 | 0.3819 | 0.2621 |
| Age 18 to 34 | 0.5214 | 0.2935 | 0.3723 | 0.2091 | 0.3080 | 0.7379 |
| Age 35 to 54 | 0.3771 | 0.3792 | 0.4232 | 0.3950 | 0.4382 | 0.2017 |
| Age 55 and Older | 0.1015 | 0.3273 | 0.2045 | 0.3959 | 0.2538 | 0.3892 |
| White, non-Hispanic | 0.5194 | 0.6967 | 0.3205 | 0.7494 | 0.3663 | 0.4091 |
| African American/Black | 0.2269 | 0.1073 | 0.3327 | 0.0984 | 0.3523 | 0.7357 |
| Hispanic | 0.2118 | 0.1291 | 0.2952 | 0.0970 | 0.2404 | 0.1209 |
| Asian | 0.0194 | 0.0474 | 0.0196 | 0.0392 | - | - |
| Native American/Alaskan | 0.0237 | 0.0160 | 0.0182 | 0.0049 | - | - |
| Other Races | 0.0078 | 0.0085 | 0.0138 | 0.0110 | 0.0410 | 0.0968 |
| Married | 0.2353 | 0.5513 | 0.2777 | 0.5404 | 0.2425 | 0.0466 |
| Single Never-Married | 0.5428 | 0.2673 | 0.3895 | 0.1905 | 0.4085 | 0.5265 |
| Divorced/Separated | 0.2002 | 0.1361 | 0.2590 | 0.1680 | 0.2748 | 0.1943 |
| Widow | 0.0216 | 0.0453 | 0.0738 | 0.1011 | 0.0742 | 0.1859 |
| Dependent Child Present | 0.4247 | 0.3818 | 0.4156 | 0.2904 | 0.4800 | 0.0933 |
| Less than a High School Education | 0.1752 | 0.0265 | 0.4029 | 0.1024 | 0.3597 | 0.4316 |
| High School Degree or Equiv. | 0.4617 | 0.2822 | 0.3695 | 0.2872 | 0.4271 | 0.1002 |
| Some College but no degree | 0.3054 | 0.4268 | 0.1805 | 0.2885 | 0.1375 | 0.3134 |
| College Degree | 0.0484 | 0.1655 | 0.0382 | 0.2072 | 0.0665 | 0.1976 |
| Post College Education | 0.0093 | 0.0989 | 0.0089 | 0.1147 | 0.0092 | 0.2525 |
| Self-Employed | 0.0686 | 0.0811 | 0.0379 | 0.0839 | 0.0794 | 0.1363 |
| Employed Full-Time | 0.1717 | 0.3728 | 0.2749 | 0.4352 | 0.3286 | 0.1166 |
| Employed Part-Time | 0.1049 | 0.0971 | 0.1340 | 0.1148 | 0.0959 | 0.5036 |
| Not in the Workforce-Homemaker | 0.1161 | 0.0874 | 0.1736 | 0.0628 | 0.0291 | 0.0432 |
| Not in the Workforce-Student | 0.0765 | 0.0573 | 0.0055 | 0.0063 | 0.0129 | 0.0134 |
| Not in the Workforce-Disabled | 0.0736 | 0.0404 | 0.1643 | 0.0453 | 0.2018 | 0.0152 |
| Unemployed | 0.3394 | 0.0844 | 0.1333 | 0.0454 | 0.1688 | 0.0572 |
| Not in the Workforce-Retired | 0.0493 | 0.1795 | 0.0764 | 0.2060 | 0.0834 | 0.0561 |
| Income less than 34,999 | 0.8426 | 0.3800 | 0.8863 | 0.3509 | 0.8662 | 0.1946 |
| Income 35,000 to 74,999 | 0.1225 | 0.3627 | 0.1028 | 0.3523 | 0.1238 | 0.3604 |
| Income greater than 75,000 | 0.0349 | 0.2573 | 0.0108 | 0.2968 | 0.0100 | 0.3418 |
| Drop in Income | 0.5629 | 0.3970 | - | - | 0.3721 | 0.2978 |
| Homeowner | 0.1656 | 0.6155 | 0.2383 | 0.7170 | 0.1838 | 0.2435 |
| At Least 1 Credit Card | 0.2040 | 0.7814 | - | - | 0.0950 | 0.6612 |
| | | | | | | 0.727 |
| Observations | 28,146 | | 46,547 | | 6,482 | |

| Table 2: Unbanked and Banked Financial Literacy | | |
|--|--------------------------------|------------------------------|
| | Unbanked | Banked |
| Financial Literacy Score (Out of 5) | 2.0261 | 3.0618 |
| | (1.4454) | (1.4121) |
| Total Don't Know Responses | 1.9822 | 1.2209 |
| | (1.669) | (1.3762) |
| | Proportion Unbanked | Proportion Banked |
| Savings Question-Correct | 0.6189 | 0.7909 |
| Inflation Question-Correct | 0.4079 | 0.6624 |
| Bond Question-Correct | 0.1948 | 0.283 |
| Mortgage Question-Correct | 0.4982 | 0.7752 |
| Stock Divers. Question-Correct | 0.3062 | 0.5503 |

Table 3: Probit Regression Results for Unbanked

| | FINRA | FDIC | SCF | FINRA | FDIC | SCF |
|-----------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Female | -0.0007 (0.0020) | -0.0043*** (0.0010) | -0.003 (0.0790) | 0.0089* (0.0050) | 0.0325*** (0.0050) | 0.0156*** (0.1040) |
| Age 18 to 34 | 0.0007 (0.0020) | 0.0009 (0.0010) | -0.0025 (0.0820) | 0.0298*** (0.0050) | 0.0251*** (0.0040) | 0.0142*** (0.1010) |
| Age 55 and Older | -0.0072*** (0.0020) | -0.0112*** (0.0020) | -0.0029 (0.0970) | 0.0005 (0.0040) | -0.0043** (0.0020) | -0.0009 (0.1480) |
| African American/Black | 0.0083*** (0.0030) | 0.0503*** (0.0050) | 0.0189*** (0.0770) | 0.0151*** (0.0020) | 0.0333*** (0.0030) | 0.0119*** (0.0910) |
| Hispanic | 0.0035 (0.0030) | 0.0310*** (0.0040) | 0.0124*** (0.0890) | -0.0003 (0.0030) | -0.0146*** (0.0020) | -0.0105** (0.2180) |
| Asian | -0.0054 (0.0040) | 0.0037 (0.0040) | -- | 0.0026* (0.0020) | -- | 0.0028 (0.0690) |
| Native American/Alaskan | -0.0027 (0.0030) | 0.0770*** (0.0210) | -- | -0.0156*** (0.0020) | -0.0250*** (0.0020) | -0.0144*** (0.0810) |
| Other Races | -0.001 (0.0040) | 0.0075 (0.0060) | -- | 0.0463*** (0.0040) | -- | -0.0391*** (0.0810) |
| Single Never-Married | 0.0098*** (0.0030) | 0.0127*** (0.0020) | 0.0144*** (0.1500) | 0.3049 (0.0040) | 0.3548 (0.0020) | 0.1853 (0.0810) |
| Divorced/Separated | 0.0110*** (0.0030) | 0.0128*** (0.0020) | 0.0438* (0.0950) | 26,585 (0.0040) | 39,731 (0.0020) | 6,482 (0.0810) |
| Widow | -0.0021 (0.0040) | 0.0058* (0.0030) | 0 | | | |
| Dependent Child Present | 0.0033* (0.0020) | 0.0084*** (0.0020) | 0.0012 (0.0720) | | | |
| Less than a High School Education | 0.0247*** (0.0060) | 0.0203*** (0.0030) | 0.0084*** (0.0820) | | | |
| Some College but no degree | -0.0088*** (0.0020) | -0.0123*** (0.0010) | -0.0062*** (0.0910) | | | |
| College Degree | -0.0104*** (0.0020) | -0.0175*** (0.0010) | -0.0078*** (0.1070) | | | |
| Post College Education | -0.0111*** (0.0020) | -0.0164*** (0.0010) | -0.0095*** (0.2150) | | | |
| Self-Employed | 0.0113** (0.0050) | -0.0005 (0.0030) | 0.0051 (0.1150) | | | |
| Employed Part-Time | 0.0039 (0.0030) | 0.0046*** (0.0020) | 0.0068* (0.1220) | | | |
| Not in the Workforce-Homemaker | 0.0147*** (0.0050) | 0.0296*** (0.0040) | 0.0114 (0.2140) | | | |
| Not in the Workforce-Student | 0.0008 (0.0030) | -0.0122*** (0.0020) | -0.0026 (0.2490) | | | |

| Table 4: Probit Regression Results for Unbanked Financial Literacy Controls | | | | | | | |
|---|------------------------|------------------------|-----------------------|----------------------|---------------------|------------------------|-----------------------|
| | I | II | III | IV | V | VI | VII |
| Financial Literacy Score (Out of 5) | -0.0026*** (0.0010) | | | | | | |
| Savings Question- Correct | | -0.0039** (0.0020) | -0.0050** (0.0030) | | | | |
| Inflation Question-Correct | | -0.0027* (0.0020) | | -0.0042* (0.0020) | | | |
| Bond Question-Correct | | 0.0016 (0.0020) | | | -0.0003 (0.0020) | | |
| Mortgage Question-Correct | | -0.0061*** (0.0020) | | | | -0.0088*** (0.0030) | |
| Stock Div. Question-Correct | | -0.0012 (0.0020) | | | | | -0.0066** (0.0030) |
| Savings Question- Don't Know | | | 0.0026 (0.0030) | | | | |
| Inflation Question-Don't Know | | | | 0.0018 (0.0020) | | | |
| Bond Question-Don't Know | | | | | -0.0009 0.0020 | | |
| Mortgage Question-Don't Know | | | | | | -0.0008 0.0020 | |
| Stock Div. Question-Don't Know | | | | | | | -0.0036 (0.0020) |
| Pseudo R ² | 0.3088 | 0.3104 | 0.3072 | 0.3068 | 3.05 | 0.3086 | 0.306 |
| Observations | 26,585 | 26,585 | 26,585 | 26,585 | 26,585 | 26,585 | 26,585 |
| Notes: | | | | | | | |
| * $p < .1$, ** $p < .05$, *** $p < .01$ | | | | | | | |
| Controlled for all demographic and socioeconomic characteristics | | | | | | | |

| Table 5: Underbanked and Fully Banked Characteristics | | | | |
|--|-------------------------------|--------------------------------|-------------------------------|--------------------------------|
| | FINRA | | FDIC | |
| Proportion of Underbanked in Sample | 0.2198 | | 0.2030 | |
| | Proportion Underbanked | Proportion Fully Banked | Proportion Underbanked | Proportion Fully Banked |
| Female | 0.5199 | 0.5100 | 0.5065 | 0.4780 |
| Age 18 to 34 | 0.4133 | 0.2702 | 0.2872 | 0.1877 |
| Age 35 to 54 | 0.4209 | 0.3697 | 0.4431 | 0.3832 |
| Age 55 and Older | 0.1657 | 0.3600 | 0.2697 | 0.4291 |
| White, non-Hispanic | 0.5928 | 0.7162 | 0.6006 | 0.7917 |
| African American/Black | 0.1809 | 0.0944 | 0.2057 | 0.0704 |
| Hispanic | 0.1634 | 0.1240 | 0.1499 | 0.0810 |
| Asian | 0.0335 | 0.0482 | 0.0159 | 0.0438 |
| Native American/Alaskan | 0.0272 | 0.0135 | 0.0102 | 0.0038 |
| Other Races | 0.0099 | 0.0080 | 0.0178 | 0.0093 |
| Married | 0.4746 | 0.5525 | 0.4523 | 0.5626 |
| Single Never-Married | 0.3268 | 0.2662 | 0.2569 | 0.1723 |
| Divorced/Separated | 0.1630 | 0.1344 | 0.2209 | 0.1564 |
| Widow | 0.0355 | 0.0469 | 0.0698 | 0.1087 |
| Dependent Child Present | 0.5252 | 0.3451 | 0.3615 | 0.2726 |
| Less than a High School Education | 0.0450 | 0.0311 | 0.1549 | 0.0867 |
| High School Degree or Equiv. | 0.3477 | 0.2752 | 0.3403 | 0.2728 |
| Some College but no degree | 0.4502 | 0.4121 | 0.3324 | 0.2774 |
| College Degree | 0.1138 | 0.1724 | 0.1206 | 0.2306 |
| Post College Education | 0.0433 | 0.1092 | 0.0518 | 0.1324 |
| Self-Employed | 0.0784 | 0.0814 | 0.0603 | 0.0897 |
| Employed Full-Time | 0.3838 | 0.3574 | 0.4516 | 0.4300 |
| Employed Part-Time | 0.0964 | 0.0967 | 0.1407 | 0.1092 |
| Not in the Workforce-Homemaker | 0.1081 | 0.0832 | 0.0763 | 0.0592 |
| Not in the Workforce-Student | 0.0630 | 0.0554 | 0.0062 | 0.0059 |
| Not in the Workforce-Disabled | 0.0618 | 0.0370 | 0.0765 | 0.0374 |
| Unemployed | 0.1257 | 0.0896 | 0.0793 | 0.0370 |
| Not in the Workforce-Retired | 0.0829 | 0.1992 | 0.1088 | 0.2312 |
| Income less than 34,999 | 0.5048 | 0.3741 | 0.4832 | 0.3146 |
| Income 35,000 to 74,999 | 0.3653 | 0.3460 | 0.3530 | 0.3512 |
| Income greater than 75,000 | 0.1299 | 0.2799 | 0.1638 | 0.3343 |
| Large Drop in Income | 0.5411 | 0.3673 | - | - |
| Homeowner | 0.4136 | 0.6433 | 0.5302 | 0.7653 |
| At Least 1 Credit Card | 0.6083 | 0.7918 | - | - |
| Observations | 26,146 | | 41,813 | |

| Table 6: Underbanked and Fully Banked Financial Literacy | | |
|---|-----------------------------------|------------------------------------|
| | Underbanked | Fully Banked |
| Financial Literacy Score (Out of 5) | 2.6725 | 3.2003 |
| | (1.3564) | (1.3935) |
| Total Don't Know Responses | 1.3873 | 1.1470 |
| | (1.4012) | (1.3419) |
| | Proportion Underbanked | Proportion Fully Banked |
| Savings Question-Correct | 0.7335 | 0.7999 |
| Inflation Question-Correct | 0.5497 | 0.6820 |
| Bond Question-Correct | 0.2315 | 0.2938 |
| Mortgage Question-Correct | 0.7189 | 0.7772 |
| Stock Divers. Question-Correct | 0.4388 | 0.5698 |

Table 7: Probit Regression Results for Underbanked

| | FINRA | FDIC | | FINRA | FDIC |
|-----------------------------------|------------------------|------------------------|-----------------------------------|------------------------|------------------------|
| Female | -0.0137** (0.0060) | -0.005 (0.0050) | Not in the Workforce-Disabled | 0.0389** (0.0170) | 0.0526*** (0.0130) |
| Age 18 to 34 | 0.0428*** (0.0080) | 0.0062 (0.0070) | Unemployed | -0.0508*** (0.0100) | 0.0670*** (0.0130) |
| Age 55 and Older | -0.0716*** (0.0090) | -0.0494*** (0.0070) | Not in the Workforce-Retired | -0.0528*** (0.0110) | -0.0750*** (0.0080) |
| African American/Black | 0.0980*** (0.0110) | 0.2085*** (0.0110) | Income less than 34,999 | -0.0048 (0.0080) | 0.0241*** (0.0060) |
| Hispanic | 0.0038 (0.0110) | 0.0616*** (0.0100) | Income greater than 75,000 | -0.0802*** (0.0080) | -0.0544*** (0.0060) |
| Asian | -0.0278 (0.0180) | -0.0967*** (0.0100) | Large Drop in Income | 0.0835*** (0.0070) | -- |
| Native American/Alaskan | 0.0695*** (0.0230) | 0.1911*** (0.0390) | Homeowner | -0.0865*** (0.0080) | -0.1035*** (0.0070) |
| Other Races | 0.018 (0.0230) | 0.1159*** (0.0260) | At Least 1 Credit Card | -0.0734*** (0.0080) | -- |
| Single Never-Married | -0.0230** (0.0090) | 0.0073 (0.0080) | | | |
| Divorced/Separated | 0.0148 (0.0100) | 0.0363*** (0.0080) | Pseudo R ² | 0.1134 | 0.1234 |
| Widow | 0.0439** (0.0190) | -0.0084 (0.0100) | Observations | 26,296 | 36,024 |
| Dependent Child Present | 0.0865*** (0.0080) | 0.0354*** (0.0070) | Notes: | | |
| Less than a High School Education | -0.0282* (0.0170) | 0.0444*** (0.0100) | * p < .1, ** p < .05, *** p < .01 | | |
| Some College but no degree | -0.0094 (0.0080) | -0.0147** (0.0060) | | | |
| College Degree | -0.0585*** (0.0080) | -0.1008*** (0.0060) | | | |
| Post College Education | -0.0799*** (0.0090) | -0.0985*** (0.0070) | | | |
| Self-Employed | -0.0240** (0.0110) | -0.0298*** (0.0090) | | | |
| Employed Part-Time | -0.0422*** (0.0100) | 0.0117** (0.0080) | | | |
| Not in the Workforce-Homemaker | -0.0214* (0.0110) | -0.0041 (0.0100) | | | |
| Not in the Workforce-Student | -0.0604*** (0.0120) | -0.0723*** (0.0230) | | | |

| Table 8: Probit Regression Results for Underbanked Financial Literacy Controls | | | | | | | |
|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | I | II | III | IV | V | VI | VII |
| Financial Literacy Score (Out of 5) | -0.0121*** (0.0020) | | | | | | |
| Savings Question- Correct | | -0.0140** (0.0080) | -0.0486** (0.0110) | | | | |
| Inflation Question-Correct | | -0.0256*** (0.0070) | | -0.0545*** (0.0090) | | | |
| Bond Question-Correct | | -0.0113 (0.0070) | | | -0.0323*** (0.0080) | | |
| Mortgage Question-Correct | | -0.0188** (0.0080) | | | | -0.0149 (0.0110) | |
| Stock Div. Question-Correct | | -0.0238** (0.0070) | | | | | -0.0702*** (0.0130) |
| Savings Question- Don't Know | | | -0.0238*** (0.0070) | | | | |
| Inflation Question-Don't Know | | | | -0.0485*** (0.0110) | | | |
| Bond Question-Don't Know | | | | | -0.0387*** (0.0090) | | |
| Mortgage Question-Don't Know | | | | | | -0.0320*** (0.0070) | |
| Stock Div. Question-Don't Know | | | | | | | -0.0315*** (0.0120) |
| Pseudo R ² | 0.1147 | 0.1158 | 0.1147 | 0.1154 | 0.1148 | 0.1138 | 0.1152 |
| Observations | 26,296 | 26,296 | 26,296 | 26,296 | 26,296 | 26,296 | 26,296 |
| <i>p < :1, p < :05, p < :01</i> | | | | | | | |
| <i>Controlled for all demographic and socioeconomic characteristics</i> | | | | | | | |

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Appendices

Appendix 1 FINRA State-by-State Financial Literacy Questions

Each question included a Don't Know/Not Sure and a Refused option.

1. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?
 - a. More than \$102
 - b. Exactly \$102
 - c. Less than \$102

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?
 - a. More than today
 - b. Exactly the same
 - c. Less than today

3. If interest rates rise, what will typically happen to bond prices?
 - a. They will rise
 - b. They will fall
 - c. They will stay the same
 - d. There is no relationship between bond prices and the interest rate

4. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.
 - a. True
 - b. False

5. Buying a single company's stock usually provides a safer return than a stock mutual fund.
 - a. True
 - b. False

Appendix 2 Comparison of Variables across Surveys

| Categories | Variables | FINRA State-by-State | FDIC | SCF |
|--|-----------------------|--|--|---|
| Dependent Variable: | | | | |
| Unbanked | Unbanked | (Do you/Does your household) have a checking account and (Do you/Does your household) have a saving account, money market account, or CDs? | (Do you/Does anyone in your household) currently have a checking or savings account? | Do you (or anyone in your family living here) have any checking accounts at any type of institution? and Do you (or anyone in your family living here) have any savings or money market accounts? |
| Underbanked Variables/ Alternative Loans | Check Cashing | Do you or your spouse sometimes go to a check cashing store to cash checks? AND Do you or your spouse sometimes cash checks at a grocery store or supermarket? | Have you or anyone in your household ever gone to a place other than a bank, a savings and loan or a credit union to cash a check that was received from someone else? | NA |
| | Money Order | Do you or your spouse sometimes pay your bills with money orders? | Have you or anyone in your household ever purchased a money order at a place other than a bank, a savings and loan or a credit union? | NA |
| | Payday Loans | In the past 5 years: Have you taken out a short term “payday” loan? | Have you or anyone in your household ever used payday loan or payday advance services? | During the past year, have you (or anyone living here) taken out a “payday loan,” that is borrowed money that was supposed to be repaid in full out of your next paycheck? |
| | Pawn Shop | In the past 5 years: Have you used a pawn shop? | Have you or anyone in your household ever sold items at a pawn shop? | NA |
| | Tax Anticipation Loan | In the past 5 years: Have you gotten an advance on your tax refund? This is sometimes called a “refund anticipation loan” or “Rapid Refund” | In the past 5 years, have you or anyone in your household taken out a tax refund anticipation loan? | NA |
| | Rent to Own | In the past 5 years: Have you used a rent-to-own? | NA | NA |
| | Auto Title Loan | In the past 5 years: Have you taken out an auto title loan? | Have you or anyone in your household ever rented or leased anything from a rent-to-own store because you | NA |

| | | | | |
|--------------------|--------------------|--|--|--|
| | | | couldn't get financing any other way? | |
| Control Variables: | | | | |
| | Gender | Male, Female | Male, Female | Male, Female |
| | Age | 18-34, 35-54, 55+ | 18-34, 35-54, 55+ | 18-34, 35-54, 55+ |
| | Race/Ethnicity | Caucasian/white, African American/ black, Hispanic, Asian, Native American/Alaskan, Other | Caucasian/ white, African American/ black, Hispanic, Asian, Native American/Alaskan, Other | Caucasian/ white, African American/black, Hispanic, Other |
| | Marital Status | Married, Single (never married), Divorced/Separated, Widow | Married, Single (never married), Divorced/Separated, Widow | Married, Single (never married), Divorced/Separated, Widow |
| | Dependents | Presence of Children under 18 | Presence of Children under 18 | Presence of Children under 18 |
| | Education | Less than High School Degree, High School Degree or equivalent, Some College Education, College Degree, Post College Education | Less than High School Degree, High School Degree or equivalent, College Degree, Post College Education | Less than High School Degree, High School Degree or equivalent, College Degree, Post College Education |
| | Work Status | Self Employed, Full Time, Part Time, Homemaker, Student Disabled, Unemployed/Laid-off, Retired | *Full Time, Part Time, Homemaker, Student Disabled, Unemployed/Laid-off, Retired | Self Employed, Full Time, Part Time, Homemaker, Student Disabled, Unemployed/Laid-off, Retired |
| | Income Level | Less than \$35,000, Between \$35,000 and \$75,000, Over \$75,000 | Less than \$35,000, Between \$35,000 and \$75,000, Over \$75,000 | Less than \$35,000, Between \$35,000 and \$75,000, Over \$75,000 |
| | Change in Income | In the past 12 months (have you/has your household) experienced a large drop in income which you did not expect? | NA | Is this income unusually high or low compared to what you would expect in a "normal" year? |
| | Homeowner | Do you (or your spouse/partner) currently own your home? | Are your living quarters (a) owned or being bought by a household member? | Do you (and your family living here) own this (house and lot/apartment/ranch/farm)? |
| | Credit Card | How many credit cards do you have? Please include store and gas station credit cards but NOT debit cards. | NA | Do you (or anyone in your family living here) have any credit cards or charge cards? |
| | Financial Literacy | See Appendix a | NA | NA |