

1. INTRODUCTION

The level of financial literacy in both developed and developing economies is generally low. In the United States, the National Financial Education Council (NFEC) refers to a “financial illiteracy epidemic” in its recent 2019 report (NFEC, 2019). In 2018 the NFEC administered the National Financial Literacy Test to over 5,500 individuals between 15 to 18 years of age. On average, the fraction of correct answers was 66 percent, only a few points higher than the average score in 2017 (62 percent) and 2016 (60 percent). The “financial illiteracy epidemic” is a global phenomenon, as revealed by cross-country comparisons. Lusardi (2019, p.3) points out that “financial literacy is low across the world and higher national income levels do not equate to a more financially literate population.”

The problem of widespread financial illiteracy is alarming given the close link between financial knowledge and actual financial outcomes. Higher levels of financial literacy are often associated with a lower probability of being unbanked (Barcellos and Zamarro, 2019) and using alternative financial services, such as payday loans (Kim and Lee, 2018). Financially literate individuals are also less likely to engage in high-cost borrowing (Lusardi, 2013) and more likely to invest in stocks. They also exhibit a higher propensity to plan for retirement (Lusardi and Mitchell, 2011a, Van Rooij et al., 2012).

The lack of financial literacy tends to be heterogeneous within the population. Such heterogeneity may be partly responsible for the observed growing inequalities between groups characterized by different access to opportunity and available financial resources. For instance, a racial/ethnic gap in financial literacy has been well documented for the United States, where Blacks and Hispanics tend to score substantially worse than Whites (Al-Bahrani et al. 2018; Lusardi and Mitchell 2011a, 2011b). In turn, these minority groups are also more likely to be

observed in the lower half of the income distribution, be unbanked/underbanked (Barcellos and Zamarro, 2019; Blanco et al., 2018; Goodstein and Rhine, 2017), and exhibit lower levels of financial health (Financial Health Network, 2018). While the existing literature has documented racial and ethnic disparities in financial literacy, we still know relatively little about what the determinants of such disparities are and what their relative importance is. Identifying the factors and mechanisms behind the racial/ethnic gap in financial knowledge is a critical step towards promoting financial inclusion and more widespread economic wellbeing in the population.

We take on this task and investigate the drivers of the racial/ethnic gap in financial literacy. For this purpose, we use the restricted version of the Survey of Household Economic Decision-making (SHED) of 2017, conducted by the Federal Reserve Board. Exploiting this rich data set, we comprehensively model financial literacy as a function of individual, family background, neighborhood, and institutional characteristics. Throughout our analysis, we underscore the role of family circumstances during childhood and neighborhood characteristics in shaping racial/ethnic disparities in financial literacy. Moreover, we investigate to what extent the determinants of the observed gaps in financial literacy between Blacks and Whites and between Hispanics and Whites differ along the income distribution. For this purpose, we perform our analysis for the entire population and separately for different income classes. We draw particular attention to the middle-income segment, where the presence of minorities has increased in recent years and where, since liquidity constraints are often less binding, removing barriers to financial literacy can greatly improve the management of available financial resources.

The remainder of this paper is as follows. In Section 2, we review the literature on the determinants of financial literacy as well as on the drivers of the racial/ethnic gap in financial

literacy and highlight the original contribution of our paper on the topic. In Section 3 we discuss the data and in Section 4 our empirical approach. Section 5 presents the results of our analysis, and Section 6 concludes.

2. LITERATURE REVIEW AND ORIGINAL CONTRIBUTION

The determinants of financial literacy span individual and family characteristics, as well as neighborhood and environmental factors. Not surprisingly, individuals' education and availability of financial resources correlate positively and strongly with the level of financial literacy (Stolper and Walter, 2017). Early-life socioeconomic circumstances are bound to affect one's financial knowledge in adulthood, yet empirical evidence on this matter is limited since comprehensive measures of family background are often unavailable (Lusardi et al., 2010). In our analysis, we investigate the role of parental education as well as of family financial strain and food insecurity as determinants of financial literacy. Hence, we evaluate how much the association between poor family background and low financial literacy stems from parental inputs and resource scarcity, while controlling for a rich set of other individual-level variables. Moreover, we assess the extent to which these early-life variables explain the observed large gap in financial literacy across racial and ethnic groups (Lusardi and Mitchell, 2011a, b; Anong, 2016; Porto, 2016)

Socioeconomic characteristics of the neighborhood in which individuals reside have been indicated as additional factors shaping financial literacy. La Chance (2014) finds that the level of education in an individual's ZIP code has a significant effect on financial literacy, above and beyond the effect of individual-level sociodemographic characteristics. Arguing that the ZIP

code's education level may proxy for the level of financial knowledge in an individual's social network, she interprets this finding as evidence of "peer effects" on financial literacy.

Another channel through which neighborhood characteristics may affect financial literacy is differential access to economic opportunities, financial institutions, services, and information (Ellen and Turner, 1997). This may also explain why minorities, who typically have limited access to such things in their neighborhood, are also at a disadvantage in terms of financial knowledge. Hamilton and Darity (2017) stress that, while the discussion on the racial/ethnic gap in financial literacy and behavior is centered around the lack of education among minorities, availability of financial resources as well as formal and informal institutional factors should really be the focus. This is because, as they state, "financial behavior and financial literacy are practically limited for households and race groups with little to no finances to manage" (Hamilton and Darity, 2017, p. 61). They go a step further and interpret existing intergroup differences as serving "a functional role in maintaining social hierarchy and promoting privileged group's relative class status" (Hamilton and Darity, 2017, p. 70). Following this argument, we investigate the effect that various neighborhood characteristics may have on one's financial literacy and the role they may play in explaining the existing racial/ethnic gap in financial literacy. Specifically, we expand on La Chance (2014)'s work by moving beyond just ZIP code-level education and including in our regression analysis a composite socioeconomic index of the Census tract where individuals live (Diez Roux et al., 2001), as well as the number of formal financial institutions and alternative financial service providers in the neighborhood. This comprehensive set of contextual variables, which has not been used by other studies on this topic, allows to better identify the sources of heterogeneity in financial literacy both in the cross section and across racial/ethnic groups.

In summary, our original contribution to this strand of the literature is twofold. First, we adopt a very comprehensive model to identify the determinants of the existing racial/ethnic disparities in financial literacy. In particular, we broaden the scope of previous work by examining to what extent financial literacy correlates with childhood family circumstances and neighborhood socio-economic indicators, after conditioning on a rich set of individual characteristics. Second, we investigate differences in financial literacy across income classes and document whether and how the racial/ethnic gap in financial literacy within each class is shaped by different underlying factors.

3. DATA

We use the Federal Reserve Board’s 2017 Survey of Household and Economic Decision-making (SHED). SHED collects extensive demographic, socioeconomic, financial wellbeing and behavioral individual-level variables. Since 2013, the SHED questionnaire has been administered annually, through the Internet Panel *KnowledgePanel*, run by GfK Custom Research of North America, a market research company. *KnowledgePanel* is a probability-based sample, representative of the US population.

In our analysis we focus on racial/ethnic differences between Whites (non-Hispanic), Blacks (non-Hispanic), and Hispanics. We focus on these three groups because they are the largest groups in the United States and have the largest representation in SHED. We exclude from our analysis other racial/ethnic groups.¹

We construct a financial literacy index using the “Big Three” questions proposed by Lusardi and Mitchell (2011a, 2011b):

¹ Other (not White or Black), non-Hispanic and belong to more than 2 races and are non-Hispanic represent 5.6% of individuals in the public version of SHED and are excluded from our analysis. From here on out we refer to White (non-Hispanics) as Whites and Black (non-Hispanics) as Blacks for simplicity.

1. Risk: Do you think the following statement is true or false? “Buying a single company’s stock usually provides a safer return than a stock mutual fund.” Answers: 1. True, 2. False, 3. Don’t know. Correct answer: false.
2. Interest: 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? Answers: 1. More than \$102, 2. Exactly \$102, 3. Less than \$102, 4. Don’t know. Correct answer: more than \$102.
3. Inflation: 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? Answers: 1. More than today, 2. Exactly the same, 3. Less than today, 4. Don’t know. Correct answer: Less than today.

We assign 1 point to each correct answer and 0 to incorrect and “don’t know” answers.

Hence, our dependent variable is a financial literacy score ranging between 0 and 3.

In our empirical analysis, we employ a rich set of explanatory variables, including individual characteristics and family background measures, which are all defined in Table 1. We use data at the ZIP code and census tract level to account for socioeconomic characteristics of individuals’ place of residence, identified via restricted geo codes.² Specifically, we construct a neighborhood socioeconomic status indicator (NSES) similar to Diez-Roux et al (2001), and used by Blanco et al. (2018). We consider additional neighborhood level variables such as number of banks and credit unions, and alternative financial service (AFS) providers weighted by population (these are entered in our model as natural logarithms).³ Table 1 provides a more detailed description of

² Given that access to the geo codes from SHED is restricted, Federal Reserve Board (FRB) staff merged the SHED with our constructed neighborhood level datasets, ran our codes, and returned to us the output results. Our project received approval by the Institutional Review Board (Protocol #18-10-874, approved in March 2019 by Pepperdine University).

neighborhood level variables. Table 2 provides summary statistics for all the variables used in our analysis.

4. METHODOLOGY

We first look at the racial/ethnic differences in financial literacy following a similar approach as in La Chance (2014). Specifically, we employ the following linear regression model to measure mediators of racial differences in financial literacy:

$$(1)$$

Our dependent variable, FL_i , is the financial literacy score for individual i . Mutually exclusive indicators for Blacks and Hispanics are denoted with $Race$, and capture differences of minority groups compared to Whites. Individual characteristics and family background variables are in the vector X_i . Neighborhood characteristics, either at the Census tract- or ZIP code-level, are denoted by N_{Z_i} ; ϵ_i is the error term.

Given the large set of explanatory variables in our model – 22 individual-level variables and 14 neighborhood-level indicators – we apply the Least Absolute Shrinkage and Selection Operator (LASSO) technique to select which variables are ultimately included in the estimated specification (see Varian, 2014).

We adopt six different specifications by progressively augmenting the number of explanatory variables in the regression equation. We first estimate a baseline regression that only features the race/ethnicity indicators, then one that includes individual characteristics selected through LASSO. In our third specification, we add all the family background variables available

³ When taking the natural logarithm of a zero value we use the truncation method, where we replace zeros with half the minimum value in our sample (in this case minimum value equal to 1) in the denominator of the population weighted indicators of the number of banks, and credit unions. For census tracts and/or zip codes with zero population we do not estimate these indicators.

in the data. In the fourth specification we only include family background variables selected through LASSO and add the NSES index as a further control. In the fifth specification, we add all neighborhood-level indicators for the presence/concentration of financial services. Finally, in our sixth and preferred specification, we include family background variables as well as neighborhood NSES/financial service indicators selected through the LASSO technique, and add the proportion of non-White minorities in the neighborhood as a further explanatory variable (this variable was also selected through the LASSO technique).

We focus on how the race/ethnicity coefficients change as more explanatory variables are added to the model. Furthermore, we conduct a Blinder-Oaxaca (BO) decomposition analysis to evaluate the relative contribution of different variables in explaining the racial/ethnic gap in financial literacy and assess how much of this gap remains unexplained. We estimate our models for the entire sample and, separately, for three income groups: low income (0-39th percentile), middle income (40th-70th percentile) and high income (71st to 100th percentiles). Hence, we explore heterogeneity in both racial/ethnic differences in financial literacy and the determinants of such differences across different income classes.

5. RESULTS

Overall, there exist stark racial/ethnic disparities in financial literacy, as documented in Figure 1 (first bar chart on the left). We observe that Whites score higher than Blacks and Hispanics by 39 and 30 percent, respectively. The mean of the financial literacy score is significantly different across racial/ethnic groups. When we estimate the means by income class, here again, Whites have higher financial literacy scores across the board. The gap is the widest within the low income group, where, on average, the fraction of correct answers in the financial

literacy quiz is 58 percent for Whites, 33 percent for Blacks, and 38 percent for Hispanics. The gap narrows somehow as the income level increases. Within the highest income group, the fraction of correct answers for Whites, Blacks, and Hispanics is 83, 63, and 71 percent, respectively. In general, Hispanics tend to perform better than Blacks at all income levels, with differences that are statistically significant in the lowest and highest income groups. Moreover, Hispanics exhibit narrower gaps than Blacks with respect to Whites as income increases.

Before moving to the regression results, we show in Table 3 which variables are selected by the LASSO technique. Not surprisingly, basic demographics and measures of financial wellbeing/sophistication – income, home ownership, whether the household receives dividends, interest or rental income, and whether it is on government assistance welfare programs – are selected. As for family background, the variable that accounts for whether the individual had food scarcity growing up is preferred over mother’s education and financial strain during childhood. The LASSO also selects the NSES index and the percent of minorities in the Census tract of residence.

Table 4 presents the results of the analysis concerning the determinants of the racial/ethnic gap in financial literacy. In Column 1, the unconditional gap in the number of correct answers to the financial literacy quiz is 0.8 for Blacks and 0.6 for Hispanics. Accounting for individual characteristics in Column 2, decreases the gap by 50 percent for Blacks and 58 percent for Hispanics. As we add characteristics related to family background, the racial/ethnic gap reduces further by 5 and 6 percent for Blacks and Hispanics, respectively (Column 3). Among the available family background variables, food scarcity growing up is the one that correlates most strongly with financial literacy and, as a result, is the one selected by LASSO (Column 4). Not surprisingly, a higher level of food insecurity during childhood is negatively

associated with performance in the financial literacy quiz, while parental education is positively associated with financial literacy score. Surprisingly, we observe that individuals with more financial issues growing up show higher financial literacy scores (column 3). One would expect that financial strain growing up is associated with lower wealth and therefore, lower financial knowledge.

The estimates in Column 4 in Table 4 refer to the model including individual characteristics and family background variables selected by LASSO as well as the neighborhood NSES composite index. As can be seen, while the NSES index is positively and significantly correlated with financial literacy, it does not contribute to explain the observed gap between Whites and minorities. In Column 5, we include measures of availability/concentration of financial services in the neighborhood. The number of banks is the only variable statistically associated with financial literacy, while the number of credit unions and alternative financial services exhibit no sizeable or significant correlation with the level of financial literacy. Overall, availability and concentration of financial services in the neighborhood plays virtually no role in explaining the financial literacy gap between minorities and Whites.

Finally, in Column 6 we present the results of our preferred specification, where all explanatory variables are selected by the LASSO procedure, including an additional control for the proportion of minorities in the Census tract where individuals reside (also selected through LASSO). As can be seen, the size of the racial/ethnic gap decreases slightly in this last specification, even if the proportion of minorities in the neighborhood is not, *per se*, associated with financial literacy. Our richest model in Column 6 explains 55 percent of the unconditional financial literacy gap between Whites and Blacks and 63 percent of the one between Whites and Hispanics (percent estimated comparing coefficients in columns 1 and 6).

Table 5 shows the results of the BO decomposition based on our preferred specification (the one in Column 6 of Table 4), which uses the variables selected by LASSO. In Column 1 of Table 5 the comparison is between Whites and Blacks; in Column 2 is between Whites and Hispanics; in Column 3 is between Blacks and Hispanics. About 52 percent of the unconditional Whites-Blacks gap is explained by the model, with individual-level variables such as education, income, and whether the household receives dividends, interest or rental income exhibiting the highest contribution (10, 7, and 12 percent of the gap, respectively). Differences in homeownership account for 4 percent of the gap, while family background and NSES characteristics together explain another 4 percent. Our model explains about 62 percent of the unconditional difference in financial literacy between Whites and Hispanics. Again, the main contributors are education and whether the household receives dividends, interest or rental income. Homeownership explains 3.5 percent of the observed White-Hispanic disparities in financial literacy, and so do family background and neighborhood characteristics combined. In Column 3, we compare Blacks and Hispanics. As can be seen, Hispanics appear to have an advantage in terms of financial literacy compared to Blacks. The unconditional difference is modest, with Hispanics scoring on average only about one fifth of a point more than Blacks in the financial literacy quiz. This gap almost entirely explained by differences in explanatory variables.

Next, we investigate to what extent racial/ethnic differences in financial literacy vary by income classes. For this purpose, we divide the sample into three income classes: low income (0-39th percentile), middle income (40th-70th percentile) and high income (71st to 100th percentiles). We then take our preferred specification to the data, separately for each income class. The results of this exercise are shown in Table 6. In general, racial/ethnic disparities between Whites and

minority groups are observed within each income class. Yet, there exist important differences in terms of what different key variables contribute to explaining the gap.

Within the lowest income class, the residual gap with respect to Whites is 0.34 for Blacks and 0.19 for Hispanics (Table 6, column 1). Among our explanatory variables of interest, food scarcity during childhood appears the one that correlates most strongly with financial literacy. The results of the BO decomposition in Table 7 show that our model explains about 50 percent of the unconditional gap for Blacks and nearly 70 percent for Hispanics. Comparing the two minority groups reveals that Hispanics perform better than Blacks, with differences entirely explained by differences in observables.

Within the middle income class, the residual gap with respect to Whites is 0.33 for Blacks and 0.27 for Hispanics (Table 6, column 2). Among our main explanatory variables of interest, the one that is most strongly and significantly associated with financial literacy is the NSES composite index, indicating that environmental and peer factors are more relevant within the middle income class than within the low income class, where resource scarcity represents a bigger deterrent for acquiring basic financial knowledge. Compared to the low income class, the unconditional gap with respect to Whites decreases for both Blacks and Hispanics for this group – as shown in Figure 1 and Table 7. Yet, the ability of our model to explain such gap is very different for these two minority groups. Within the middle income class, our model explains 45 percent of the unconditional gap for Blacks and 49 percent for Hispanics, as opposed to 50 and 70 percent within the low income class, respectively. Hence, compared to the low income class, within the middle income class the White-Hispanic gap in financial literacy appears to be driven to a greater extent by unobserved factors – for example, cultural and psychological barriers (Blanco et al, 2018) – which are not accounted for in our specification. It is worth pointing out a

further difference between the low and middle income class. While among low income households Hispanics tend to perform better than Blacks in terms of financial literacy, this advantage is not observed at all among middle income households.

Intrigued by these patterns, in Table 8 we provide the full BO decomposition for the middle income class. Receiving dividends, interest or rental income is the largest contributor to explaining the White-minority gap, accounting for 15 percent of the White-Black gap and 13 percent of the White-Hispanic gap. The contribution of homeownership is also quite similar for the two minority groups – 4 percent of the White-Black gap and 3 percent of the White-Hispanic gap – and so are the contribution of government assistance and neighborhood characteristics. We observe significant gender differences, whereby sex explains 9 percent of the gap for Blacks, but has virtually no explanatory power for Hispanics. In contrast, the contribution of age, education and income is much larger for Hispanics (5, 10, and 7 percent of the gap, respectively) than for Blacks (1, 2, and 3 percent of the gap, respectively).

Within the highest income class, the residual gap with respect to Whites is 0.44 for Blacks and 0.20 for Hispanics and none of our explanatory variables of interest is associated with financial literacy (Table 6, column 3). The BO decomposition in Table 7 reveals that our model explains only 28 percent of the unconditional gap for Blacks and about 43 percent for Hispanics. Thus, for both groups a large fraction of the gap remains unexplained, despite our rich set of controls. Analogously to what we observe within the low income class, Hispanics perform better than Blacks, scoring about one quarter of a point more in the financial literacy score. Again, this difference is mostly accounted for by differences in observables.

6. CONCLUSION

The level of financial literacy is heterogeneous across races and income classes. Given the fundamental role of financial literacy in informing financial decisions, differences in financial literacy are likely to be reflected in differences in financial outcomes, thereby contributing to growing inequalities across segments of the population. Interventions aimed at improving financial knowledge, and, therefore, financial wellbeing among minorities and more disadvantaged individuals require a better understanding of what determines financial literacy disparities across groups. The goal of this paper is to provide further insights on the determinants of financial literacy differences by race/ethnicity and income.

For this purpose, we use the restricted version of the Survey of Household Economic Decision-making (SHED) of 2017, conducted by the Federal Reserve Board, to explore how financial literacy correlates with individual, family background, neighborhood, and institutional characteristics. We underscore the role of family circumstances during childhood and neighborhood characteristics in shaping racial/ethnic disparities in financial literacy. Moreover, we investigate the extent to which the determinants of the observed gaps in financial literacy between Whites and minority groups differ within different income classes.

As documented by the existing literature, we find that Blacks and Hispanics are at a clear disadvantage compared to Whites as far as basic financial knowledge is concerned. This phenomenon is apparent across all income classes, although is slightly more pronounced among low income households. Individual-level characteristics explain half of the gap for Blacks and about two thirds for Hispanics. Family circumstances during childhood, especially food scarcity, account for 5 percent of the gap. Neighborhood socio-economic characteristics and availability of financial services are significantly associated with the level of financial literacy, but do not contribute to explain the observed gap of minorities with respect to Whites. Our model explains

52 percent of the unconditional gap between Blacks and Whites and 62 of the gap between Hispanics and Whites.

The analysis by income reveals interesting patterns. The largest racial disparities in the level of financial literacy are observed within the lowest income class. Moving along the income distribution narrows the racial/ethnic gap, but to a larger extent for Hispanics than for Blacks. Food scarcity during childhood is an important driver of financial knowledge in the lowest income class, while neighborhood socio-economic characteristics significantly affect financial literacy among middle income individuals. Our model explains a larger proportion of the racial/ethnic gap among low income individuals than among more affluent individuals. Hispanics exhibit higher levels of financial literacy than Blacks within the low and high income classes, but not within the middle income class. When we zero in on the middle income class, we observe that differences in age, education, and income contribute significantly to explain the gap between Hispanics and Whites, while playing only a marginal role in determining disparities between Blacks and Whites.

In summary, our study shows that a substantial share of the existing racial/ethnic gap in financial literacy can be explained by differences in various individual characteristics and environmental factors. Yet, a relatively large part of this gap remains unexplained and its size varies significantly across income classes. This points to the existence of different, relevant barriers towards availability, acquisition, and retention of financial knowledge faced by minorities at different levels of income. Future research should identify what such barriers are and quantify their role in determining racial/ethnic disparities in financial literacy across income classes.

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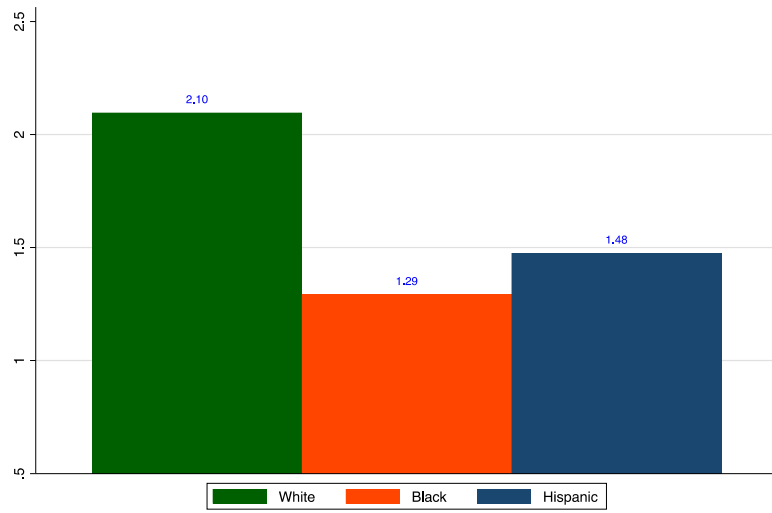
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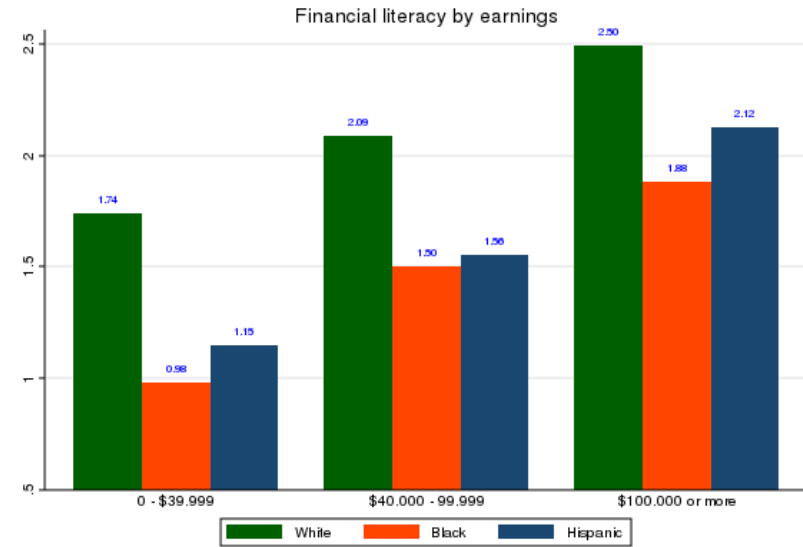
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Figure 1. Financial Literacy by Race/Ethnicity and Income*
Panel A



Source: SHED 2017



Source: SHED 2017

* Unweighted means. Income groups are: 1) low income, 0-\$39,999 (0-39th percentile), 2) middle income, \$40,000-\$99,999 (40th and 70th percentile), and 3) high income, \$100,000 or more.

Table 1. Description of Variable Construction and Source

Variable name	Description
<i>Source: SHED (Survey of Household Economic Decision-making), from the Federal Reserve Board. Retrieved online: https://www.federalreserve.gov/consumerscommunities/shed_data.htm</i>	
Financial literacy score	The financial literacy score has a value in the range of 0-3, where it is the addition of the correct answers to the Big Three questions. The three questions related to risk, interest, and inflation we use in our analysis are the following: 1) Risk: Do you think the following statement is true or false? “Buying a single company’s stock usually provides a safer return than a stock mutual fund.” Answers: 1. True, 2. False, 3. Don’t know. Correct answer: false. 2) Interest: 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? Answers: 1. More than \$102, 2. Exactly \$102, 3. Less than \$102, 4. Don’t know. Correct answer: more than \$102. 3) Inflation: 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? Answers: 1. More than today, 2. Exactly the same, 3. Less than today, 4. Don’t know. Correct answer: Less than today.
Race/ethnicity	Categorical variable equal to 0 if household respondent is white, non-Hispanic; equal to 1 if black, non-Hispanic, and equal to 2 if Hispanic
Household head	Dummy variable equal to 1 if respondent is the household head, equal to 0 otherwise.
Male	Dummy variable equal to 1 if respondent is the male, equal to 0 otherwise.
Household size	Continuous variable denoting the number of people in the household, values 1-12
Couple household	Dummy variable equal to 1 if a couple household (married or living with a partners), equal to 0 otherwise
Children in household	Dummy variable equal to 1 if there are children (ages 0-17) in the household, equal to 0 otherwise
Employment status	Dummy variable equal to 1 if working, equal to 0 otherwise. To determine working we use the following question in survey: Think about the main job that you had in the past month (the job from which you earned the most income in the past month). In this job, did you: Work full-time for someone else, Work part-time for someone else, Work for yourself (self-employed) or as a sole-proprietor, Work as a partner in a partnership (e.g. partner in law firm, medical practice), Work as a consultant/contractor
Age	Continuous variable equal to respondent age (value in the range of 18-94). We consider age and squared age in our analysis.
Household income	Categorical variable equal to 0 if household is in the range 0-\$39,999, equal to 1 if income is in the range \$40,000-\$99,999, and equal to 2 if income is greater than \$99,999. We use the following questions from SHED. Which of the following categories best describes the total income that you [and/ or your spouse/ partner] received from all sources, before taxes and deductions, in the past 12 months? Where we collapsed several categories together.
Educational attainment	Categorical variable denoting educational attainment, in the range of 0-3. Variable equal to 0 if high school degree or less, equal to 1 if some college or associate degree, equal to 2 if bachelor’s degree, and equal to 3 if master's degree or higher
Government assistance	Dummy variable equal to 1 if household received government assistance, equal to 0 otherwise.

Government assistance programs considered for constructing this variable: Earned Income Tax Credit, Supplemental Nutrition Assistance Program (SNAP or food stamps), Women, Infants, and Children (WIC) nutrition program benefits, Assistance with housing payments from a state, county, or federal program, and Free or reduced price school lunches, Cash assistance from a state or county welfare program, such as TANF.

Dividends, interest or rental income	Dummy variable equal to 1 if household received dividends, interest or rental income, equal to 0 otherwise. Question from SHED: In the past 12 months, did you [and/or your spouse / and/or partner] receive any income from the following sources: [Interest, dividends, or rental income]
Social Security	Dummy variable equal to 1 if household received dividends, interest or rental income, equal to 0 otherwise. Question from SHED: In the past 12 months, did you [and/or your spouse / and/or partner] receive any income from the following sources: [Social Security]
Supplemental Security	Dummy variable equal to 1 if household received dividends, interest or rental income, equal to 0 otherwise. Question from SHED: In the past 12 months, did you [and/or your spouse / and/or partner] receive any income from the following sources: [Supplemental Security (SSI)]
Pension	Dummy variable equal to 1 if household received dividends, interest or rental income, equal to 0 otherwise. Question from SHED: In the past 12 months, did you [and/or your spouse / and/or partner] receive any income from the following sources: [Pension income]
Metropolitan area	Dummy variable equal to 1 if household resides in a metropolitan area, equal to 0 otherwise.
State	Dummy variables for state of residence of the household.
Home ownership	Categorical variable equal to 0 if household doesn't own a home, equal to 1 if it owns home but has no mortgage, equal to 2 if it owns home with mortgage.
Debt ownership	Dummy variable if household has student loans, credit card and medical debts, equal to 0 otherwise.
Physical health	Categorical variable of self-reported health equal to 0 if poor, equal to 1 if fair, equal to 2 if good, equal to 3 if very good, and equal to 4 if excellent. Question from SHED: In general, would you say your physical health is...?
Mother's educational attainment	What is the highest level of education that your mother completed?
Family financial issues	When you were growing up (under age 17), how frequently did you worry about each of the following? Your family's finances
Family food scarcity	When you were growing up (under age 17), how frequently did you worry about each of the following? Having enough food to eat

Source: ACS (American Community Survey), from the US Census Bureau. Data purchased from GeoLytics.

Neighborhood SES indicator	Neighborhood Socio-Economic (NSES) Index constructed similarly to Diez-Roux et al (2001) and Blanco et al. (2018), as the principal component of the following variables at the census tract level: The NSES index is constructed following Diez Roux et al. (2001) by estimating the principal component of the following variables: 1) median household income (natural log), 2) median value of housing units (natural log), 3) percent households with interest, dividend, or rental income, 4) percent of residents 25 years and older that completed high school, 5) percent of residents 25 years and older with a college degree, and 6) percent of residents in executive, managerial, or professional specialty occupations. To construct this index, we use data from the
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2017 American Community Survey (ACS). The reference geographic unit is a Census tract and the created NSES-DR index is associated to each SHED respondent using restricted SHED geographic identifiers.

Median household income	Median household income in census tract (natural log).
Median housing value	Median value of housing units in census tract (natural log). For values equal to zero use truncation, where we calculate the natural logarithm of the half the minimum value.
Interest income, percent	Percent households in census tract with interest, dividend, or rental income.
High school completed, percent	Percent of residents in census tract 25 years and older that completed high school.
College degree, percent	Percent of residents in census tract 25 years and older with a college degree.
Managerial occupation, percent	Percent of residents in census tract in executive, managerial, or professional specialty occupations.
Minority residents, percent	Percent of residents in the census tract that are minority (blacks, Hispanics, and Native American).
Speak English, percent	Percent of residents in the census tract that are speak English.
Speak Spanish, percent	Percent of residents in the census tract that are speak Spanish
Non-citizen residents, percent	Percent of residents in the census tract that are non-citizens

Source: Summary of Deposits (SOD) Database, Federal Deposit Insurance Corporation. Retrieved online: <https://www5.fdic.gov/sod/sodInstBranch.asp?barItem=1>

Number of banks (weighted by population)	We use data from the Federal Deposit Insurance Corporation (FDIC, 2016) that identifies the location of each financial institution branch and construct the number of financial institutions at the census tract level. We construct a weighted indicator by dividing the number of financial institutions by the population in the census tract. In the empirical analysis, we consider the number (in natural log) of financial institutions in the census tract where the individual resides in the previous year of the survey. For those census tracts in which we did not observe that a financial institution was located, we set the number of financial institutions equal to zero. When taking the log, these observations were set equal to a number slightly below the minimum taken by the log-transformed variable (natural log of 0.5). We used ArcGIS to create census tract using financial institution location.
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Source: Credit Union Branch Information, National Credit Union Administration. Retrieved online: <https://www.ncua.gov/analysis/credit-union-corporate-call-report-data/quarterly-data>

Number of credit unions (weighted by population)	We use data from the National Credit Union Administration (FDIC, 2016) that identifies the location of each credit union branch and construct the number of credit unions at the census tract level. In the empirical analysis, we consider the number (in natural log) of credit unions the census tract where the individual resides in the previous year of the survey. For those census tracts in which we did not observe that a credit union was located, we set the number of credit unions equal to zero. When taking the natural log, these observations were set equal to a number slightly below the minimum taken by the log-transformed variable (natural log of 0.5). We used ArcGIS to create census tract using credit union location.
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Source: ZIP Codes Business Patterns, US Census Bureau. Retrieved online: <https://www.census.gov/data/developers/data->

Number of alternative financial services	We created the number of alternative financial services in the zip code using US Census data in 2016, similarly to Bhutta (2014) and Goodstein and Rhine (2017). We created an indicator that aggregated the number of business in the zip code from NAICS 522390 (Non-depository consumer lending institutions).
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Table 2. Summary Statistics

	%	Mean	Std. Dev.	Min	Max
Individual/Household Level Variables					
Financial literacy score		1.96	1.06	0	3
Race and ethnicity					
White, non-Hispanic (no=0, yes=1)	79.6				
Black, non-Hispanic (no=0, yes=2)	9.3				
Hispanic (no=0, yes=1)	11.1				
Household head (no=0, yes=1)		0.86	0.34	0	1
Gender (female=0, male=1)		0.50	0.50	0	1
Household size		2.38	1.34	1	12
Couple household (no=0, yes=1)		0.62	0.49	0	1
Household with children (no=0, yes=1)		0.22	0.42	0	1
Works (no=0, yes=1)		0.55	0.50	0	1
Age		54.23	16.97	18	94
Income categories					
Group 1, <\$39,000	39.4				
Group 2, \$40,000-\$99,999	35.1				
Group 3, >\$99,999	25.5				
Education					
High school or less (no=0, yes=1)	23.8				
Some college or more (no=0, yes=1)	34.9				
Bachelor's degree (no=0, yes=1)	24.3				
Master's degree or higher	17.0				
Receives welfare (no=0, yes=1)		0.18	0.39	0	1
Receives dividends, interest or rental income (no=0, yes=1)		0.36	0.48	0	1
Receives social security (no=0, yes=1)		0.39	0.49	0	1
Receives supplemental security income (no=0, yes=1)		0.05	0.21	0	1
Receives pension (no=0, yes=1)		0.27	0.44	0	1
MSA status (non-metro=0, metro=1)		0.88	0.33	0	1
Home ownership					
Owns home, no mortgage (no=0, yes=1)	26.9				
Owns home with mortgage (no=0, yes=1)	43.7				
Has debt (no=0, yes=1)		0.48	0.50	0	1
Health, physical (index, 0-4; 0=poor, 4=excellent)		2.42	0.93	0	4
Education, mother					
High school or less (no=0, yes=1)	59.2				
Some college or more (no=0, yes=1)	23.2				
Bachelor's degree (no=0, yes=1)	11.8				

<u>Neighborhood Level Variables</u>				
NSES Index ¹	0.2	1.0	-2.4	3.5
Median household income	10.9	0.4	9.1	12.4
Median housing value	12.1	0.6	9.4	13.8
Interest income, percent	22.8	11.8	0	73
High school completed, percent	26.8	10.6	0.57	62.2
College degree, percent	19.7	10.0	0	60.8
Managerial occupation, percent	15.0	7.3	0	52.4
Minority residents, percent	25.4	25.7	0	100
Speak English, percent	80.7	18.4	0.62	100
Speak Spanish, percent	10.9	15.8	0	99.4
Non-citizen residents, percent	14.2	19.0	0	100
Number of financial institutions (weighted by population)	-2.3	1.7	-4.1	3.1
Number of credit unions (weighted by population)	-3.5	1.2	-4.1	1.4
Number of alternative financial services	-9.6	1.0	-12.0	-4.1

Notes: No. of obs. =9,696. Individual/household level data obtained from public version of the Survey of Household and Economic Decision-making, 2017. NSES index is the neighborhood socioeconomic status index constructed as the principal component of median household income, median household value, percentage of households with interest income, percentage of residents with high school, percentage of residents with college, and percentage of residents in managerial positions (we follow the methodology of Diez Roux et al. 2001). All variables correspond to the census tract and zip codes where households reside at the time of the survey was collected. Data on neighborhood characteristics obtained from the Census American Community Survey (ACS 2016 5-year average, denoted with a superscript 1), Census Zip code Business Patterns (CZBP 2016, denoted with a superscript 2), Federal Deposit Insurance Corporation Directory (FDIC 2016, denoted with a superscript 3), and National Credit Union Association (NCUA 2016, denoted with a superscript 4). Number of banks, credit unions, and AFS are weighted by population at the census tract (for banks and credit unions) and zip code (for AFS), where we present here the natural logarithm.

Table 3. Variable Selection with LASSO Technique

Variable	LASSO	Post-Est. OLS
Black	-0.2709	-0.3703
Hispanic	-0.1505	-0.2285
Household head	0.0479	0.0709
Male	0.3910	0.4076
Employment status	0.0129	0.0844
Age	0.0047	0.0074
Income groups		
Income, group 2	0.0857	0.1630
Income group 3	0.2802	0.3126
Educational attainment		
Some college or associate degree	0.0849	0.3190
Bachelor's degree	0.3302	0.5632
Master's degree or higher	0.3461	0.5755
Government assistance	-0.1610	-0.1405
Dividends, interest or rental income	0.3534	0.3365
Supplemental Security	-0.0484	-0.1389
Home ownership	0.0286	0.0498
Family food scarcity	-0.0094	-0.0245
NSES indicator	0.0403	0.0306
Minority residents, percent	-0.0005	-0.0007

Table 4. OLS Regressions with Individual, Family and Neighborhood Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Black	-0.8248*** (0.0360)	-0.4159*** (0.0328)	-0.3940*** (0.0339)	-0.3954*** (0.0329)	-0.3906*** (0.0330)	-0.3737*** (0.0356)
Hispanic	-0.6154*** (0.0341)	-0.2600*** (0.0309)	-0.2436*** (0.0317)	-0.2458*** (0.0310)	-0.2418*** (0.0310)	-0.2279*** (0.0329)
Educ. Attain. Mother (high school or less)			-0.0133 (0.0221)			
Educ. Attain. Mother (college or associate degree)			0.0741** (0.0292)			
Educ. Attain. Mother (masters or higher)			0.0331 (0.0398)			
Family financial issues			0.1189*** (0.0202)			
family food scarcity			-0.1528*** (0.0289)	-0.0965*** (0.0252)	-0.0960*** (0.0252)	-0.0965*** (0.0252)
NSES indicator				0.0361*** (0.0102)	0.0340*** (0.0106)	0.0300*** (0.0108)
Number of banks, weighted					0.0115** (0.0053)	
Number of credit unions, weighted					-0.0075 (0.0077)	
Number of AFS					-0.0030 (0.0092)	
Minority residents, percent						-0.0007 (0.0004)
Observations	10,323	10,323	9,869	10,323	10,323	10,323
R-squared	0.0744	0.3323	0.3356	0.3343	0.3339	0.3344

Dependent variable is the financial literacy index (0-3 range). Coefficients for race/ethnicity, individual, family, and neighborhood level variables with robust standard errors in parentheses. Statistical significance denoted as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Estimates individual level variables, which are denoted in Table 3, and constant are omitted in the interest of space.

Table 5. Blinder-Oaxaca Decomposition

	(1) White (G1) vs. Black (G2)	(2) White (G1) vs. Hispanic (G2)	(3) Black (G1) vs. Hispanic (G2)
Group 1	2.1032***	2.1032***	1.2784***
Group 2	1.2784***	1.4878***	1.4878***
Gap	0.8248***	0.6154***	-0.2094***
Gap explained by diff. in variables	0.4360***	0.3828***	-0.0497*
Contribution to explaining the gap by....			
Household head	0.0061** (0.0028)	0.0068 (0.0044)	0.0036 (0.0033)
Male	0.0552*** (0.0072)	0.0157** (0.0065)	-0.0363*** (0.0090)
Age	0.0281*** (0.0048)	0.0530*** (0.0074)	0.0368*** (0.0091)
Education	0.0802*** (0.0090)	0.0882*** (0.0084)	0.0098 (0.0101)
Income	0.0624*** (0.0069)	0.0477*** (0.0057)	-0.0190** (0.0076)
Government assistance	0.0234*** (0.0066)	0.0242*** (0.0056)	-0.0002 (0.0019)
Dividends, interest or rental income	0.0982*** (0.0072)	0.0791*** (0.0064)	-0.0147*** (0.0057)
Supplemental Security	0.0112*** (0.0035)	0.0063*** (0.0023)	-0.0015 (0.0018)
Family food scarcity	0.0125*** (0.0034)	0.0125*** (0.0044)	0.0044 (0.0029)
Home ownership	0.0310*** (0.0083)	0.0216*** (0.0058)	-0.0095* (0.0057)
Neighborhood SES indicator	0.0190*** (0.0073)	0.0115*** (0.0040)	-0.0031 (0.0098)
Minority residents, percent	0.0088 (0.0180)	0.0161 (0.0133)	-0.0201** (0.0083)
Observations	9,177	9,364	2,105

Statistical significance denoted as *** p<0.01, ** p<0.05, * p<0.1.

Table 6. OLS Regressions by Income

	(1) Low Income	(2) Middle Income	(3) High Income
Black	-0.3401*** (0.0524)	-0.3338*** (0.0663)	-0.4362*** (0.0794)
Hispanic	-0.1884*** (0.0531)	-0.2705*** (0.0580)	-0.2032*** (0.0597)
family food scarcity	-0.1332*** (0.0369)	-0.0199 (0.0465)	-0.0751 (0.0498)
NSES indicator	0.0139 (0.0209)	0.0462** (0.0198)	0.0205 (0.0161)
Minority residents, percent	-0.0011* (0.0007)	-0.0003 (0.0008)	-0.0002 (0.0008)
Observations	3,782	3,523	3,018
R-squared	0.2855	0.2495	0.2210

Dependent variable is the financial literacy index (0-3 range). Coefficients for race/ethnicity, individual, family, and neighborhood level variables with robust standard errors in parentheses. Statistical significance denoted as *** p<0.01, ** p<0.05, * p<0.1. Estimates individual level variables, which are denoted in Table 3, and constant are omitted in the interest of space.

Table 7. Blinder-Oaxaca Decomposition by Income

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Low Income			Middle Income			Higher Income		
	White vs. Black	White vs. Hispanic	Black vs. Hispanic	White vs. Black	White vs. Hispanic	Black vs. Hispanic	White vs. Black	White vs. Hispanic	Black vs. Hispanic
Group 1	1.7399***	1.7399***	0.9808***	2.0900***	2.0900***	1.5017***	2.4958***	2.4958***	1.8808***
Group 2	0.9808***	1.1496***	1.1496***	1.5017***	1.5569***	1.5569***	1.8808***	2.1244***	2.1244***
Gap	0.7591***	0.5903***	-0.1688***	0.5882***	0.5331***	-0.0552	0.6150***	0.3714***	-0.2436**
Gap explained	0.3830***	0.4084***	-0.0193	0.2643***	0.2617***	0.0568	0.1704***	0.1593***	-0.0531
Observations	3,274	3,261	1,029	3,110	3,236	700	2,793	2,867	376

Statistical significance denoted as *** p<0.01, ** p<0.05, * p<0.1. Using same variables as those denoted in Table 5.

Table 8. Blinder-Oaxaca Decomposition for Middle Income Class

	(1) White (G1) vs. Black (G2)	(2) White (G1) vs. Hispanic (G2)	(3) Black (G1) vs. Hispanic (G2)
Group 1	2.0900***	2.0900***	1.5017***
Group 2	1.5017***	1.5569***	1.5569***
Gap	0.5882***	0.5331***	-0.0552
Gap explained by diff. in variables	0.2643***	0.2617***	0.0568
Percentage of the quantity effect explained by....			
Household head	0.0015 (0.0034)	0.0032 (0.0065)	0.0074 (0.0072)
Male	0.0513*** (0.0154)	0.0058 (0.0124)	-0.0487** (0.0213)
Age	0.0062 (0.0041)	0.0273*** (0.0106)	0.0701*** (0.0237)
Education	0.0148 (0.0138)	0.0548*** (0.0123)	0.0437** (0.0200)
Income	0.0182*** (0.0070)	0.0348*** (0.0095)	0.0092 (0.0090)
Government assistance	0.0171** (0.0079)	0.0162** (0.0079)	-0.0001 (0.0011)
Dividends, interest or rental income	0.0885*** (0.0120)	0.0670*** (0.0100)	-0.0157 (0.0104)
Supplemental Security	0.0037 (0.0032)	0.0014 (0.0017)	0.0001 (0.0014)
Family food scarcity	0.0011 (0.0044)	0.0050 (0.0078)	0.0001 (0.0064)
Home ownership	0.0220** (0.0101)	0.0306*** (0.0101)	-0.0018 (0.0053)
Neighborhood SES indicator	0.0165* (0.0090)	0.0088** (0.0041)	-0.0116 (0.0144)
Minority residents, percent	0.0235 (0.0321)	0.0066 (0.0238)	0.0041 (0.0133)
Observations	3,110	3,236	700

Statistical significance denoted as *** p<0.01, ** p<0.05, * p<0.1.