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# The Smart Money is in Cash? Financial Literacy and Liquid Savings Among U.S. Families\*

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## Abstract

Most financial advisors recommend storing three to six months of expenses in liquid assets in case of an emergency. Yet we estimate that more than half of U.S. families do not have at least three months of their non-discretionary expenses in liquid savings. We find that financial literacy is strongly predictive of having three months of liquid savings, controlling for income, income variability, and even parental resources. We also find that financial literacy predicts liquid savings across the income distribution. These results indicate that accumulation of an emergency fund is not simply a function of income. Finally, financial literacy is predictive of liquid savings even among high illiquid wealth households. This suggests that the phenomenon of “wealthy hand-to-mouth” families may reflect financial mistakes rather than portfolio optimization. Our paper highlights the importance of financial knowledge in explaining families’ preparedness to deal with unexpected expenses or disruption in their income.

*JEL classification:* G5, G51, G53, D14, D91

*Keywords:* Financial Literacy, Savings, Liquidity, Household Wealth, Household Finance

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\*The analysis and conclusions set forth are those of the authors and do not indicate concurrence with the Board of Governors or the Research Staff. We thank participants at the JAPP Annual conference for helpful comments and suggestions.

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# 1 Introduction

Professional financial planners typically recommend families maintain an easily accessible “emergency fund” of three to six months of expenses to help deal with unexpected expenses or disruptions in income. Many financial planners indicate that establishing these funds should be the very first step in a families’ financial plan, and recommend prioritizing an emergency fund over paying down debt or saving for retirement so that families can avoid high-cost borrowing when an emergency arises.<sup>1</sup> However, there is mounting evidence that many families report having little to no easily accessible liquid savings (Lusardi et al., 2011; Larrimore et al., 2017). Recent analyses have offered competing explanations for the absence of liquid savings amongst US households. Some research finds this behavior reflects a lack of financial knowledge or financial mistakes (Hilgert et al., 2003; Lusardi et al., 2011; Anderson et al., 2017). In contrast, some argue that a lack of emergency savings simply reflects low income, with little role for financial acumen. For example, Elizabeth Warren (2019) recently argued, “Americans don’t need cliché financial advice. They just need to be paid more.” And yet other work suggests that saavier households may prefer to save in illiquid assets such as housing, rather than liquid assets, in order to earn higher returns (Kaplan et al., 2014).

In this paper, we provide novel estimates of liquid savings across the wealth and income distributions. In addition, we shed new light on why so many families have so little liquid savings by assessing the drivers of liquid savings, including financial literacy, income, and family resources. To conduct our analysis, we use rich financial, demographic, and spending data from the nationally representative Survey of Consumer Finances (SCF).

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<sup>1</sup>See, for example: <https://investor.vanguard.com/emergency-fund/> or <https://www.businessinsider.com/personal-finance/how-much-money-to-save-in-emergency-fund-rules>. Not only is borrowing typically more costly than spending out of savings due to interest, penalties and fees, but borrowing may not be readily available in an emergency. For example, if one loses their job it might be difficult to qualify for a bank loan or a higher credit card limit. More informal borrowing channels, such as borrowing from family and friends can also prove to unavailable, particularly if there is an economy-wide shock causing the financial emergency.

To begin, we construct a measure of liquid savings for emergencies which operationalizes the concept often recommended by financial planners: a buffer of at least three months of a family’s own expenses. The SCF interview carefully walks respondents through every type of account they could potentially hold, including highly liquid transaction and investment accounts, providing comprehensive and reliable data on the amount of liquid savings families have.<sup>2</sup> We compare liquid savings to families’ normal, recurring expenses, including their housing costs, vehicle payments, debt payments, medical costs, and food costs.<sup>3</sup> We find that only 49 percent of families have three months of their own normal, recurring expenses saved in liquid assets, and only 39 percent have six months. A sizable fraction of families have very little or no buffer.

We then examine the characteristics of families who do and do not follow the financial planner rules of thumb for emergency saving.<sup>4</sup> Not surprisingly, we find that low levels of savings are most common among families whose incomes are low, who are younger, who are single parents, and who come from more modest family backgrounds (as captured by their parent’s level of education and whether or not they have ever received an inheritance). However, a lack of liquid savings is by no means restricted to these groups. Sixty percent of married couples with children do not have three months of expenses saved; and even among the top quartile of income earners, almost a quarter of families do not have three months of expenses in liquid savings.

After establishing that many families across the income distribution lack sufficient liquid emergency savings to cover their own expenses, we try to uncover explanations for this lack of savings, including the potential role of financial literacy. We estimate a series of regression

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<sup>2</sup>As noted in Section 2.1, our measure of liquid savings is fairly expansive and includes money held in several categories such as checking and savings accounts, money market accounts, directly held stocks, and mutual funds.

<sup>3</sup>These expenses are reported directly in the SCF. We also supplement this data with imputations of a variety of additional expenses based on families’ economic and demographic characteristics. This procedure is described in detail section 2.

<sup>4</sup>To be sure, we acknowledge that these rules of thumb are not necessarily “optimal” for all families. Nonetheless, given the widespread use of these rules by financial planning experts, we view these outcomes as reasonable proxies for an ideal level of savings for most families.

models relating a respondent’s level of financial literacy and other economic characteristics to the probability that the family has at least three months of their own expenses in liquid savings. Our key objective measure of financial literacy is the well-known battery of three questions about respondents’ understanding of interest rates, inflation, and diversification created by Lusardi and Mitchell (2011a). These questions were recently added to the SCF in 2016.

Our analysis indicates that liquid savings is strongly related to financial literacy. Answering all three financial literacy questions correctly is associated with an eight percentage point, or 17 percent, increase in the probability that a family has 3 months of expenses saved in liquid assets. Importantly, we control for a unique set of potentially confounding economic determinants. For example, we control for parental educational attainment and receipt of an inheritance to account for family resources. We also control for a family’s “usual income” which is a variable unique to the SCF, designed to approximate permanent income. Additionally, we control for whether or not the family has experienced a recent income or expenditure shock which might have (temporarily) depleted their savings, as well as whether a family is usually able to predict their income over the next year. Although income is an important predictor of liquid savings, controlling for this battery of income variables does not come close to eliminating the relationship between emergency savings and financial literacy. In fact, our estimates imply that answering all three financial literacy questions correctly has the same impact on savings as a 60 percent increase in usual income. Furthermore, we find that financial literacy has a stronger relationship with liquid savings amongst the bottom tercile of income earners, suggesting an even more important role for financial literacy amongst those with the fewest available resources to enable saving.

Other possible markers of financial knowledge are also correlated with the propensity to have at least three months of expenses in liquid savings, above and beyond the financial literacy “test” measure. We find that respondents’ self-assessment of their household’s

financial knowledge is positively related to having three months of liquid assets, as is educational attainment. While there is some debate around how to interpret self-assessed financial knowledge (see e.g. Allgood and Walstad (2016)) as well as the connection between financial behavior and formal education, to the extent these variables capture other important dimensions of financial literacy, the relationship between financial literacy — broadly construed — and liquid savings may be stronger than the results we describe above for the particular financial literacy test alone.

We also explore more expansive measures of savings, as it is plausible that some households may prefer to save in higher return “quasi-liquid” and illiquid assets such as retirement accounts or housing over highly liquid assets. Though quasi-liquid and illiquid assets are more difficult to access in an emergency than liquid assets, there is scope for liquefying these assets. For example, retirement accounts can often be borrowed against or liquidated with a fee or penalty, and housing can be tapped using home equity loans or lines of credit (pending loan approval). Still, we find that substitution into quasi-liquid and illiquid assets does not have the potential to fully explain families’ lack of savings; 34 percent of families do not have three months of expenses saved even when we include their quasi-liquid accounts, and 21 percent do not have a three month buffer when we add up their liquid, quasi-liquid and real estate (net) assets.

We find that there is a sizeable share of the population that does not have three months of their own expenses in liquid savings, but holds substantial illiquid savings. Kaplan et al. (2014) document a similar phenomenon, referring to such families as the “wealthy hand-to-mouth” and hypothesized that these families could be allocating their savings rationally, since quasi-liquid or illiquid accounts can earn higher returns because of, for instance, tax sheltering and employer matching contributions. However, our analysis reveals that higher financial literacy is associated with less wealthy hand-to-mouth behavior. Among the wealthiest tercile by illiquid wealth, those who answer all three financial literacy questions correctly

are 9 percentage points (or 11 percent) more likely to have three months of non-discretionary expenses in liquid savings compared with those who miss at least one question. This suggests that financial mistakes, rather than financial sophistication, seems to contribute to the phenomenon of wealthy-hand-to-mouth households, at least on average.

Our preferred interpretation of these findings is that financial literacy leads to higher liquid savings either because financially literate households are more aware of the importance of such buffers and/or are more capable of accumulating liquid savings due to better understanding of financial concepts. However, an alternative interpretation might be that higher levels of saving leads to higher financial literacy through knowledge gains resulting from exposure to financial markets and institutions, or because those with more wealth have a greater incentive to invest in their own financial literacy. While this alternative is difficult to completely rule out, we note that even among the top tercile of illiquid wealth holders, we still find a positive relationship between financial literacy and liquid savings.<sup>5</sup>

Our work builds on a growing body of literature concerning families' preparedness for financial emergencies. Lusardi et al. (2011) find that nearly half of families in the U.S. say they probably could not manage a \$2,000 expense. Larrimore et al. (2017) finds that about 40 percent of Americans would not choose to cover an unexpected \$400 expense using cash or its equivalent (Larrimore et al., 2017). Kaplan et al. (2014) compares liquid savings to income and estimates that about one-third of U.S. families are hand-to-mouth. We expand on this research by providing novel estimates of the distribution of liquid savings relative to recurring expenses across all U.S. households. Gauging families' financial cushion relative to their normal, recurring expenses is a valuable way to assess financial fragility. Unlike an absolute dollar benchmark, it is family specific. It also removes the potential for misclassification due to year-to-year income volatility.<sup>6</sup> Further, unlike income, our measure

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<sup>5</sup>In addition, we find that high financial literacy is associated with an increase in the probability of having three months of liquid savings even when we exclude directly held stocks from our definition of liquid savings, indicating that the relationship between financial literacy and liquid savings is not solely driven by stock market experience.

<sup>6</sup>We find that 15 percent of households in the bottom quartile of net worth experienced a large negative

accounts for geographic variation in living costs. Finally, because the SCF walks respondents through each type of account and records assets account-by-account (and asks respondents to consult account statements), it may better avoid issues of recall bias or mental accounting that might cause survey respondents to mis-judge their actual preparedness for an emergency (and furthermore, could be correlated with their financial literacy).

Our work also builds on the literature relating financial literacy to financial decision-making.<sup>7</sup> Several papers relate financial literacy to financial decision-making around retirement savings<sup>8</sup>, homeownership,<sup>9</sup>, stock market participation<sup>10</sup>, and loan repayment<sup>11</sup>. Some researchers have also examined the relationship between financial knowledge and emergency savings. Hilgert et al. (2003) find that financially knowledgeable people are more likely to have an emergency savings account, though the amount of emergency savings was not probed. Lusardi et al. (2011) find that those who received financial education in school are ten percentage points more likely to say they could cover a \$2,000 emergency expense. Anderson et al. (2017) relate financial literacy to a self-assessed indicator of having sufficient precautionary savings using a survey of LinkedIn members. Our paper contributes to this literature by examining the relationship between financial literacy and actual savings held in liquid accounts relative to documented expenses, using a representative sample of all US households.

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income shock in 2015, 9 percent in the second quartile, 7 percent in the third quartile and 7 percent in the top quartile. We define a large income shock here as being more than one-third of normal income.

<sup>7</sup>See for details: Campbell (2006) Lusardi and Mitchell (2014)

<sup>8</sup>See for details: Lusardi and Mitchell (2017), Lusardi and Mitchell (2011b), Lusardi and Mitchell (2011a)

<sup>9</sup>See for details: Gathergood and Weber (2017)

<sup>10</sup>See for details: Cupák et al. (2020), Calvet et al. (2007), Almenberg and Widmark (2011)

<sup>11</sup>See for details: Allgood and Walstad (2016)



## 2 Data and Methods

We employ data from the 2016 and 2019 waves of the Survey of Consumer Finances (SCF) to estimate families’ savings behavior.<sup>12</sup> The SCF is a triennial survey on household wealth in the US conducted by the Board of Governors of the Federal Reserve System. The SCF is designed to be nationally representative, employing a dual-frame sampling design which ensures coverage of the entire wealth distribution.<sup>13</sup> The SCF is administered in person, and provides data on each individual asset and debt held by a household as well as demographic characteristics. Respondents are asked to consult financial accounts and tax documents to provide the most accurate information.<sup>14</sup> The SCF is widely regarded as one of the best sources for household wealth data in the US. Aggregate debts and assets estimated from the SCF have been shown to line up well with other well-known aggregate data sources (Dettling et al., 2015).

The bottom half of Table 1 displays information on the demographic and economic characteristics of households in the SCF sample. To measure income, we use a unique measure available in the SCF referred to as “normal income.” Many families experience temporary fluctuations (both positive and negative) in their total pre-tax income, and this measure attempts to reflect a family’s income in an average year, similar to the economic concept of permanent income. Table 1 indicates that mean normal income is \$105,000, with a high degree of variation.<sup>15</sup>

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<sup>12</sup>The SCF has been conducted in a comparable form since 1989. However, since the financial literacy test questions were not added until 2016, we will only use the two most recent survey waves in our analysis.

<sup>13</sup>See Bricker et al. (2016) for details on the sampling process. The SCF employs two samples: a nationally representative set of families who are sampled using an address-based area probability sample and an over-sample of wealthy families selected from administrative records derived from tax returns. The over-sample ensures the data capture the small minority of families who hold the large majority of wealth. All estimates in this paper employ the SCF replicate weights to combine the two samples and produce nationally representative estimates of families’ wealth, income, and expenses. All standard errors in this paper are adjusted to account for both sampling variability and multiple imputation.

<sup>14</sup>Sometimes respondents are unable to provide, or uncomfortable disclosing, the exact value of a given asset. In this case, the respondent is asked to provide a range. The SCF uses multiple imputation to correct for inexact and omitted responses. See Kennickell (1998) for details on the imputation process.

<sup>15</sup>Median “normal income” in our sample is \$59,000. While mean and median annual income are \$108,000 and \$57,000 respectively

Table 1 also displays a number of additional measures of income that we use in our analyses. We create an indicator variable for whether or not a family typically has “volatile income” based on families response to a question asking if they usually have a good idea of what their next year’s income will be. We define three dummy variables indicating whether or not the household experienced a positive or negative income shock in the previous year. We define a positive income shock as any household making more in income in the previous year than a normal year.<sup>16</sup> We define negative income shocks conversely, except that we further qualify the magnitude of the shock as either large or small.<sup>17</sup> Table 1 shows that in our sample, 26 percent of families typically experience year-to-year income volatility. About 9 percent of families had a positive income shock, while 7 percent had a small negative income shock and another 7 percent had a large negative income shock. Table 1 also indicates that about 24 percent of families are considered to have experienced a recent expense shock, which we define based on whether or not a family reports that their expenses were “unusually high” in the past 12 months, aside from any major durable or housing purchases.

## 2.1 Estimation of Savings

In this paper, we are interested in examining families’ emergency savings. To do so, we focus our primary analysis on savings that are liquid and can be accessed in an emergency without any penalties, fees, or the need to take out a loan. Thus, we define liquid savings as including: checking, saving, and money market accounts; cash and prepaid cards; directly held stocks, bonds, and mutual funds; and currently received retirement plans (such as IRAs).<sup>18</sup>

Notably, our main measure of emergency savings omits some widely held quasi-liquid and illiquid assets, such as housing and defined contribution (DC) retirement accounts from which

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<sup>16</sup>The median positive income shock in our sample is 33% of normal income

<sup>17</sup>The differentiation between a large and small negative income shock is defined as being above or below the conditional median negative income shock, which in this case is 33.02%.

<sup>18</sup>Currently received retirement plans are defined contribution plans households are currently taking withdrawals from, typically because the family is retired or has reached retirement age. They are typically associated with a past job and include 401(k)-type plans than have been rolled over into an IRA.

families have not begun to make withdrawals (e.g., 401(k)s and IRAs). We omit these assets from our main savings measure because families may not be able to easily access those funds in an emergency without taking out a loan or paying a withdrawal penalty and taxes. In some of our analyses we will consider broader measures of savings which include quasi-liquid assets, which we define quasi-liquid assets as the sum of account-type retirement plans (401k or IRA), certificates of deposit or savings bonds, and cash-value life insurance accounts. In some analyses we will further include housing assets, since financial innovation has allowed families to extract home equity using home equity loans and lines of credit. In that case, we define housing wealth as the net value of home equity held in the primary residence and other residential and non-residential real estate, where the net value is the current reported value of the real estate net of any outstanding mortgages and loans. Henceforth we will refer to this combined measure of quasi-liquid and net real-estate wealth as simply “illiquid wealth”. Notably this measure of illiquid assets omits certain assets like vehicles and family businesses.<sup>19</sup>

## 2.2 Estimation of Expenses

We are interested in operationalizing the financial planner “rule of thumb” that families should have several months of their own expenses saved for an emergency. For our analysis, we will focus on expenses a family would need to cover to “get by” for several months if they were to face an income disruption. Thus, we focus on critical recurring expenses such as food, housing, and vehicle costs. We omit durables and discretionary spending from our measure of expenses, assuming that families could delay such spending in the event of an income disruption. According to the Consumer Expenditure Survey (CEX), expenditures on recurring expenses (that is, total spending excluding discretionary and durables spending)

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<sup>19</sup>Appendix table A2 has details on wealth by category.

represents about 60 percent of total annual consumption expenditures.<sup>20</sup>

Though the SCF has comprehensive information on all assets and debts a household owns, there is somewhat less comprehensive information on expenses because the survey was not explicitly designed as a consumption survey. Still, the SCF reports a household's mortgage payments, rental payments, property taxes, home insurance, condo fees, vehicle lease and loan payments, student loan payments, credit card payments, other miscellaneous debt payments, and spending on food. According to the CEX, these expenses represent two-thirds of the average families' total monthly recurring expenses (total expenses net of durables and discretionary expenses).<sup>21</sup>

We then impute the remaining one-third of CEX recurring expenses using a family's demographic and economic characteristics, following the methodology used in Bhutta and Dettling (2018) and Bhutta et al. (2020a). We calculate utility expenses (electric, water, gas, etc.) as 0.5 percent of the home value for homeowners annually, or 10 percent of rent for renters, unless the rent includes some (all) utilities, in which case it is five percent (nothing) of rent. Home insurance, if not included in the mortgage payment, equals 0.5 percent of the home's value annually. We assume internet and cable television equal \$100 per month and cell phone expenses equal \$50 a month per family member over age 16. We estimate that housing maintenance for home owners equals one percent of the home's value annually and vehicle maintenance equals \$500 a year per vehicle. We also estimate that gas equals \$1,000 per year per adult family member and car insurance equals \$800 per year for one car and an additional \$600 per year for each additional car.<sup>22</sup>

To impute health care costs, we assume the average out-of-pocket health insurance costs,

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<sup>20</sup>We calculate normal, recurring expenses in the CEX to include food, shelter, utilities, household operations, transportation, and healthcare. See <https://www.bls.gov/cex/tables/calendar-year/mean/cu-all-multi-year-2013-2020.pdf>.

<sup>21</sup>In 2016, the average CEX family had \$3,296 in total monthly expenses excluding durables and entertainment/leisure costs, \$2,076 of which were expenses directly recorded in the SCF. See <https://www.bls.gov/cex/2016/combined/income.pdf>.

<sup>22</sup>We do not attempt to estimate child care costs because the survey does not indicate if a family has child care expenditures.

drug costs and medical supply costs by family size and age based on the CEX. Only SCF families that report paying health insurance costs are given the CEX average health insurance amount for that year, which we inflate by group to account for zeros from families who do not pay for health insurance (typically because they are enrolled in government-provided insurance, which is recorded in the SCF).

Our measure of expenses is very similar to that obtained from the CEX, validating the SCF expense data as well as our imputation approach. For example, in 2016, our estimate of mean monthly expenses is within \$15 of mean CEX monthly expenses (excluding durables). The estimates for the SCF and CEX also line up well throughout the income distribution and across family types.<sup>23</sup>

## 2.3 Measuring Financial Literacy

Our goal in this paper is to shed light on why some families accumulate liquid savings for emergencies while many other families do not and our primary explanatory variable of interest is financial literacy. We measure financial literacy using the well-known battery of three questions about respondents’ understanding of interest rates, inflation, and diversification created by Lusardi and Mitchell (2011a).<sup>24</sup> In most specifications we consider a binary indication of whether or not the respondent answered all three questions correctly, where we consider a non-response (e.g., “Don’t Know”) as an incorrect answer. The SCF first asked respondents these financial literacy questions in the 2016 survey wave, and they were asked again in 2019.

Table 1 rows 2-6 display summary statistics of the financial literacy variables used in

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<sup>23</sup>Appendix Table A1 displays our data on expenses by income quartile and type of expense. For the CEX data, see <https://www.bls.gov/cex/2019/combined/income.pdf>. Across income quintiles, 2016 CEX (2016 SCF) monthly expenses are as follows: first quintile \$1,677 (\$1,713), second quintile \$2,398 (\$2,417); third quintile \$3,077 (\$3,326); fourth quintile \$3,954 (\$4,735); and fifth quintile \$6,264 (\$8,027), where CEX expenses refer to total expenses excluding durables and entertainment. For comparability, we group SCF families according to the quintile cutoffs used by the CEX. See <https://www.bls.gov/cex/2016/combined/income.pdf>.

<sup>24</sup>The battery of questions is listed in Appendix 1.1

our analysis. The majority of respondents are able to answer the question on interest and inflation in the financial literacy battery correctly (79 percent and 76.6 percent, respectively), while fewer households are able to correctly answer the question about diversification (61.7 percent). 43 percent of respondents answer all three questions correctly. Notably, these results fall in the middle range of previously studied populations who answered the same battery of questions, including as the National Financial Capability Study (NFCS) and the American Life Panel (ALP). The SCF sample performs better on all three questions than the respondents of the NFCS, but worse on all three questions than ALP respondents.<sup>25</sup>

This measure of financial literacy is also correlated with other potential measures of financial knowledge included in the SCF. For example, the SCF asks respondents to self-assess their family's level of financial knowledge on a scale from one to ten. As detailed in Table 1, the average respondent rates their household's financial knowledge at around a seven out of ten.<sup>26</sup> The top panel of Figure 1 indicates that financial literacy generally increases with self-rated financial knowledge. Similarly, the bottom panel of Figure 1 indicates that educational attainment is positively correlated with financial literacy. That said, highly-educated respondents do not always perform perfectly on the financial literacy test: amongst respondents with a Bachelor's or advanced degree, less than 70% answer all three financial literacy questions correctly.

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<sup>25</sup>In the NFCS, 65% of respondents answer the interest question correctly, 64 percent answer the inflation question correctly, and 52 percent answer the diversification question correctly (Foundation, 2009). In the ALP, 92.9 percent, 91.4 percent and 77 percent provided the correct answer to the interest, inflation, and diversification questions respectively (Lusardi and Mitchell, 2007).

<sup>26</sup>Notably, while the financial literacy battery is only given to the respondent, this self-assessment refers to the financial knowledge of the entire household. Because the SCF asks for the most financially knowledgeable household member to be the respondent, this may lead financial knowledge according to the self-assessment to be mechanically somewhat lower than what is obtained from the financial literacy battery.

### 3 How Many Families Have Three or Six Months of Expenses Saved?

With the expense and savings data in hand, we can proceed with estimating how many families follow financial planner rules of thumb for liquid savings. Figure 2 displays the full distribution of savings relative to expenses. For any given value on the horizontal axis, the line indicates the share of families that have liquid savings of at least that many months of expenses. We highlight the values at two typical rules of thumb for saving: three months and six months. The graph indicates that only 49 percent of families have liquid savings equal to three or more months of expenses, and just 39 percent have equal to or more than six months.

Next, we examine the demographic and economic characteristic of families who do and do not have sufficient liquid savings to cover their expenses for three or six months. Table 2 shows the results and indicates that the percent of respondents with liquid savings sufficient to cover three or six months of their own expenses varies greatly between income groups: only 26 percent of households in the first quartile of income (incomes below about \$30,000) have three months of expenses in liquid savings, compared to 49 percent of all families. And the proportion with three or six months of expenses saved grows as we move up the income ladder. This positive correlation is consistent with the notion that family income is an important factor in families' ability to save.

Although the proportion of families with sufficient liquid savings to cover their expenses increases with income, it is not the case that all high-income families have sufficient savings to cover their expenses for three months. Indeed, Table 2 indicates that even among the top quartile by income (those with incomes over about \$100,000) almost a quarter of families do not have three months of expenses saved, and 37 percent do not have six months saved in liquid assets.

Across demographic groups, we find that savings generally increase with age, consistent with life-cycle wealth accumulation patterns. Still, even amongst those reaching retirement age (55-65), almost half of families do not have three months in liquid savings. Across family status, we find that single parents are the least likely to have three or six months expenses in liquid savings: just 17 percent of single parents have sufficient liquid savings to cover three months of their own expenses. Amongst married families with children, just 40 percent have three months of their own expenses in liquid savings.

### **3.1 Accounting for Quasi-Liquid Savings**

As noted earlier, one explanation for low levels of liquid savings is that families may opt to instead save in quasi-liquid or illiquid assets, such as retirement accounts or housing, which can yield higher returns. These types of savings generally can be accessed if needed, but there may be limitations, penalties and taxes that have to be paid, or a loan may need to be taken out (and in some cases, qualifying may be challenging in the event of job loss). But these types of savings may be optimal for some families; for example, families with stable incomes and expenses may decide that the higher returns that can be offered by such quasi-liquid accounts outweigh any potential fees or penalties.

Figure 3 mirrors Figure 2 but instead displays the number of households who could cover the number of months of expenses indicated on the horizontal axis using a combination of liquid and quasi-liquid savings (dashed line) or a combination of liquid, quasi-liquid and net real estate assets (solid line). Figure 3 indicates that 66 percent of households have at least three months of expenses in liquid and quasi-liquid savings, and 79 percent have three months of expenses in liquid, quasi-liquid and housing assets. Thus, including quasi-liquid and housing assets into a broader measure of savings indicates that more – but certainly not all – families have savings equivalent to three to six months of expenses.



## 4 Why Do Families Hold (or not Hold) Liquid Savings?

Thus far, we have documented that a significant share of families do not follow the financial planner rules of thumb of having liquid savings to cover three months or more of their own expenses. In this section, we move on to understanding the economic and demographic determinants of families' holdings of liquid savings.

### 4.1 Empirical Specification

In order to understand the determinants of whether families have sufficient liquid savings, we estimate a series of ordinary least squares regressions of the following form:

$$\begin{aligned} Liquidity_i = & \beta_0 + \beta_1 FinLit_i + \beta_2 SubjFinLit_i + \beta_3 Educ_i + \mathbf{Income}_i \boldsymbol{\delta} + \\ & \mathbf{FamBackground}_i \boldsymbol{\gamma} + \mathbf{X}_i \boldsymbol{\omega} + \epsilon_i \end{aligned} \tag{1}$$

Where  $Liquidity_i$  is the outcome of interest. In our main specification, this will be an indicator for whether or not the family has at least three months of their own expenses in liquid savings. In later robustness checks, we alternatively use log of months of expenses or an indicator for having six months of expenses in liquid savings.

Our main independent variable of interest is financial literacy ( $FinLit_i$ ), defined as a binary indicator for whether the respondent was able to answer all three financial literacy questions correctly. In later robustness checks, we alternatively use separate indicators for correctly responding to each of the three financial literacy questions. If more financial knowledge is positively correlated with following the financial planner rules of thumb for emergency savings,  $\beta_1$  will be positive. If more financially sophisticated families limit their liquid wealth (opting instead for higher return illiquid assets),  $\beta_1$  will be negative.

We also include in equation 1 the subjective measure of financial literacy ( $SubjFinLit_i$ ) described earlier which is the families' self-assessment of their own financial knowledge (de-

scribed in more detail in Section 2). Research indicates that such variables can have independent effects on financial behavior above and beyond performance on the financial literacy battery (e.g., Allgood and Walstad, 2016). One interpretation of this measure (on top of the objective measure) is confidence in one’s own financial skills (e.g., Cupák et al., 2020). If the objective measure is not a complete measure of financial literacy, the subjective measure could add additional information about actual financial knowledge.

Equation 1 also includes the respondent’s level of education, captured by the highest degree obtained ( $Educ_i$ ). Figure 1 indicates that education covaries with financial knowledge. Education is also positively correlated with own income and parental resources and support (e.g., Bhutta et al., 2020b), both of which can contribute to the level of savings a family is able to accumulate. Formal education may also affect one’s financial knowledge.

Our goal is to uncover the relationship between financial literacy and savings behavior, net of other economic characteristics that might covary with savings behavior and financial knowledge. Key among the variables we include in our model is family income. If many families lack savings because their incomes do not support saving, we would expect a positive relationship between income and savings, and possibly a more limited (or no) role for financial literacy. Because income can vary from year to year, and thus may not reflect the resources available for saving in the recent past, the vector **Income<sub>i</sub>** includes “normal” income as well as indicators for having a positive, small negative, or large negative income shock, and whether a family typically experiences income volatility, as described above in section 2.

Another important determinant of families’ current level of savings will be recent expenditure shocks. Some families may dutifully follow the rules of thumb and save for emergencies, but have depleted those funds if a financial emergency recently occurred. Thus, we also include in **Income<sub>i</sub>** an indicator for having recently experienced an unexpected large expense, as this may indicate a family which recently dipped into their liquid savings but would otherwise have more savings.

We also consider family background and the possibility of extended family support as another possible source of liquidity to enable establishing an emergency fund. Thus, the vector **FamBackground<sub>i</sub>** includes an indicator for whether the respondent ever received an inheritance as well as the highest level of education obtained by the respondents' parents.

Finally, the vector **X<sub>i</sub>** also includes a number of standard demographic variables which could be related to family and life-cycle saving behavior, such as age, gender of the respondent, race, marital status, and the presence of children. The vector **X<sub>i</sub>** also includes survey year fixed effects.

## 4.2 The Relationship Between Financial Literacy and Liquid Savings

Table 3 displays the results of estimating equation 1. Column 1 displays the result of estimating a sparse version of equation 1 which omits most of the control variables and shows the correlation between financial literacy and liquid savings.<sup>27</sup> The point estimate on *FinLit<sub>i</sub>* in column 1 is positive and statistically significant at the 1 percent level, and indicates that answering all three questions correctly is associated with an 18.5 percentage point (or 38 percent at the mean) increase in the propensity to have three months in liquid savings.

Column 2 of Table 3 adds self-rated financial knowledge to the regression, and indicates an independent relationship with liquid savings, consistent with previous research which has uncovered evidence that self-rated financial knowledge has effects on financial behavior above and beyond objective financial literacy (e.g., Allgood and Walstad, 2016).

Column 3 adds the measure of usual income to the regression specification. Supporting the notion that there is a positive correlation between income and savings, the coefficient on usual income indicates that a 10 percent increase in usual income is associated with an

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<sup>27</sup>All of the results in 3 include the standard demographic variables in **X<sub>i</sub>** (gender, marital status, children, age, race) and survey year fixed effects.

increased propensity to have three months of expenses saved of about 1.7 percentage points. Comparing columns 2 and 3 indicates that coefficients on the two financial literacy variables shrink noticeably, but remain sizeable and statistically significant at the one percent level.

Column 4 of Table 3 adds the measures of income and expense volatility to the regression specification. The results indicate that income and expense shocks have independent effects on savings, above and beyond the measure of usual income. For example, we find that a recent large negative income shock is associated with a 9 percentage point reduction in the likelihood of having at least three months of expenses saved. Still, the coefficient on  $FinLit_i$  is little changed from column 3.

Column 5 adds formal education to the regression specification. The coefficients on  $Educ_i$  in Table 3 indicate a positive association between education and liquid savings. Compared to those with a high school degree or some college, families with respondents who have a Bachelors or advanced degree are 10 percentage points more likely to have three months of expenses saved. This magnitude is similar to in size to answering all three questions correctly in the financial literacy battery.

Finally, column 6 adds the measures of family background and extended family support (**FamBackground<sub>i</sub>**). Both inheritance receipt and greater levels of parental education are positively correlated with having three months saved. This is consistent with the notion that inter-generational transfers can enable additional saving (See, for example, Bhutta et al., 2020b). Still, in this model which includes all of the control variables in equation 1 – the most conservative and our preferred specification– the coefficient on  $FinLit_i$  remains sizeable and statistically significant at the one percent level.

Taking the coefficients on objective financial literacy, subjective financial literacy, and education together suggests that an expansive measure of financial literacy potentially has a much larger explanatory role for liquid savings than the three-question financial literacy test alone. It is conceivable, for example, that there is additional variation in financial

literacy among people who get the same score which might be captured by the subjective literacy question or educational attainment. In addition, while the financial literacy test is administered only to the SCF respondent, the subjective financial literacy question might better capture the financial literacy of the household.

That said, the interpretation of self-rated financial knowledge — conditional on objective financial literacy — is not clear cut. Effects of self-rated knowledge on behavior have been interpreted as the effect of financial confidence (e.g., Cupák et al. (2020)), or perceptions of literacy. Taking this interpretation seriously, our results differ somewhat from Anderson et al. (2017) who find that perceptions of knowledge are more important than actual knowledge in predicting precautionary savings. The estimates in column 5 indicate that self-rated financial knowledge is not quite as important as objective financial literacy: moving from a middling self-rated assessment of financial knowledge (5) to a self-assessment of 10 is associated with about a 3.1 percentage point increase in the propensity to have a three month emergency fund.

### **4.3 Can't save or don't save? Financial Literacy, Income and Liquid Savings**

A common explanation for why some families lack liquid savings is that their incomes are simply too low to permit saving (e.g., Warren, 2019), and therefore we might expect a limited role for financial acumen in explaining savings behavior once we control for income, particularly amongst those whose incomes are the lowest.

Our preferred specification in Table 3 column 6 indicates there is an independent role for financial literacy in explaining savings behavior, above and beyond all of the income and family background variables. Comparing the coefficient on  $FinLit_i$  to the coefficient on  $Income_i$  highlights just how important financial literacy might be in savings decisions: our estimates imply that the effect of being able to answer the financial literacy questions

correctly is similar to the effect of a 60 percent increase in usual income.

We can also examine whether there exists any differences across the income distribution in the importance of financial literacy for having three months in liquid savings. *Ex ante* it's unclear whether financial literacy should play a differential role in savings by income. On the one hand, if it is true that low income families would not benefit from financial advice but instead simply need more income in order to build savings, then we might expect financial literacy to play a relatively small role in explaining whether or not low income families have emergency savings. On the other hand, if higher income families passively (rather than actively) save, we might find that financial literacy is less important for those with higher incomes.

In Table 4, we probe these possibilities by estimating equation 1 separately income tercile. Column 1 indicates that correctly answering the financial literacy questions increases the probability of having a three month expense buffer by 7 percentage points (or 26 percent) for the bottom tercile of income earners. By comparison, the coefficient in column 3 implies financial literacy increases the propensity to have a 3 month buffer by 9.1 percentage points (or 13 percent) among the top income tercile. In other words, Table 4 suggests that financial literacy is about twice as important for savings decisions amongst those with the lowest incomes, compared to those with the highest incomes.

#### **4.4 Financial Literacy and the Allocation to Illiquid Savings**

Thus far we have shown that financial literacy is strongly correlated with the propensity to hold at least three months of expenses in the form of liquid savings among US households. But what about the subset of the population documented by Kaplan et al. (2014) who hold little to no liquid assets but significant illiquid assets (e.g., the “wealthy hand-to-mouth”)? As hypothesized by Kaplan et al. (2014), these families might be making a financially savvy choice to hold little to no liquid savings in an effort to optimize their portfolio allocation

towards quasi-liquid or illiquid assets, which can have higher returns because of, for instance, tax sheltering.

Table 5 splits families into terciles according to the level of illiquid wealth they hold. The final row of Table 5 shows the share of families in each tercile with three months of expenses in liquid savings.<sup>28</sup> Although the propensity to hold three months in liquid savings increases as we move up the illiquid wealth distribution, even amongst the top tercile of illiquid wealth holders –who hold over \$200,000 in illiquid wealth– a sizeable share (nearly 21 percent) do not do not have sufficient liquid savings to cover three months expenses. This is consistent with the findings of Kaplan et al. (2014) that a sizeable fraction of otherwise wealthy families have limited liquid savings.

If financial acumen leads families to optimally allocate their portfolio in illiquid savings at the expense of liquid savings, then we would expect a *negative* correlation between financial literacy and liquid savings amongst those with considerable illiquid assets. To formally test this hypothesis, Table 5 displays the results of re-estimating equation 1 by illiquid wealth tercile. The coefficient on  $FinLit_i$  is positive and statistically significant throughout the illiquid wealth distribution. Strikingly, amongst the top tercile of illiquid wealth holders, answering the three financial literacy questions correctly is associated with a 8.4 percentage point (10.6 percent at the dependent variable mean) increase in the propensity to hold three months in liquid assets. This suggests that financial mistakes –rather than financial saavy– appears to be driving “wealthy hand-to-mouth” behavior, at least on average.

## 4.5 Extensions and Robustness

We conducted a number of extensions and robustness checks on our results. Table 6 examines the robustness of our results to alternative ways of measuring financial literacy. Column 1 replicates our main results from Table 3, column 6 for comparison. Column 2 re-estimates

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<sup>28</sup>Note that the number of observations is not consistent across terciles, and is notably larger in the third tercile because of the SCF dual-sampling frame, which over-samples wealthier households.

equation 1 but excludes self-rated financial knowledge from the regression. As shown, the coefficient on financial literacy increases only slightly from 8.1 percentage points to 8.3 percentage points. Column 3 replaces our measure of financial literacy with separate indicators for performance on each of the literacy questions. All three questions have a statistically significant positive association with having a three month emergency fund, with the diversification question having the largest magnitude correlation. Column 4 re-estimate equation 1 using the fraction of questions answered correctly as the measure of  $FinLit_i$ . Because we would expect respondents to answer at least one question correctly by simply guessing, the most useful way to frame these results is to examine moving from one question correctly to all three. Using this framing, the magnitude of the effect of moving from one to three correct answers on the financial literacy test is comparable to our headline indicator of getting all three questions correct. In column 5 we remove the objective financial literacy battery and only include the self-assessment of financial knowledge. The coefficient on  $SubjFinLit_i$  variable is only slightly larger than in previous columns.

Table 7 examines the robustness of our results to using alternative outcome variables, where each row shows the results of separate regressions in which we replace  $Liquidity_i$  with the variable listed in column 1. The estimate on  $\beta_1$  and its standard error are shown in column 2 and the R-Squared is shown in column 3, and column 4 displays the dependent variable mean. In the first row of Table 7 we look at the natural log of the number of months of expenses covered by liquid savings. Row 1 indicates a strong relationship on the intensive margin of liquid savings. In the second row, we examine the propensity for families to hold 6 months expenses in liquid savings, another common financial planner rule of thumb. The coefficient on financial literacy is similar — relative to the mean — to our main estimate shown in Table 3.

In the next six rows of Table 7, we consider the effect of financial literacy on the probability of having at least three and six months of expenses in various combinations



of liquid, quasi-liquid and/or illiquid assets. In each case, financial literacy is positively related to the outcomes, although the magnitudes are in general somewhat smaller compared to our main estimate, especially relative to the mean of the dependent variables. This suggests financial literacy is particularly important in the decision to have savings in an easily accessible emergency fund, as compared to the decision to save overall.

In the next two rows of Table 7 we exclude direct and indirectly held stocks from our measure of liquid savings to probe the possibility that stock market participation drives the relationship we observe between financial literacy and the propensity to have an emergency fund. The results are similar to the main results, suggesting stock market participation does not explain the relationships we have uncovered between financial literacy and having an emergency fund to cover three months expenses.

In last row of Table 7, we look at our main outcome variable (having at least 3 months of expenses in liquid assets) but restricting the sample to respondents under 55 years old. This excludes those likely to be retired, who may be subject to less income variability due to earning steady pension and social security income. Among this younger sample, we find a somewhat stronger relationship between financial literacy and having a 3 month emergency fund.

## 5 Conclusion

Financial advisors often recommend families store three to six months of their own expenses in liquid accounts for emergencies. This paper documents that half of families do not follow these rules of thumb and have less than three months expenses in liquid savings. Exploiting the rich information contained in the SCF on families' income, wealth, spending, family background, and attitudes, we probe why families lack liquid precautionary savings. We find that higher levels of financial literacy are positively correlated with liquid savings, even when controlling for income, education, family background and recent shocks to income

and expenditures. The role financial literacy plays in explaining families propensity to have an emergency fund is economically sizeable; for example, we find that answering all three financial literacy questions correctly is similar to the effect of a 60 percent increase in usual income. This relationship is strong even among the top tercile of illiquid wealth holders, suggesting that the phenomenon of “wealthy hand-to-mouth” families may reflect financial mistakes rather than portfolio optimization.

At the time of writing this paper, the US has begun to start recovering from the COVID-19 pandemic and associated job losses. Early in the pandemic, unprecedented volumes of unemployment insurance claims led to delays in benefit receipt, and accompanied reports of food insecurity while families waited for their benefits.<sup>29</sup> This experience highlighted the important role a financial buffer of expenses can play for families’ health and well-being. It also highlighted the policy relevance of understanding why families save, and what might be done to increase savings. Our results indicate that policy interventions that increase financial knowledge could increase savings and families’ ability to weather future financial emergencies.

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<sup>29</sup>For a discussion of the difficulties in getting unemployment insurance benefits, see <https://www.brookings.edu/blog/up-front/2020/05/13/incomes-have-crashed-how-much-has-unemployment-insurance-helped/>. For an account of food insecurity at the onset of the pandemic, see <https://www.nytimes.com/2020/04/08/business/economy/coronavirus-food-banks.html>.

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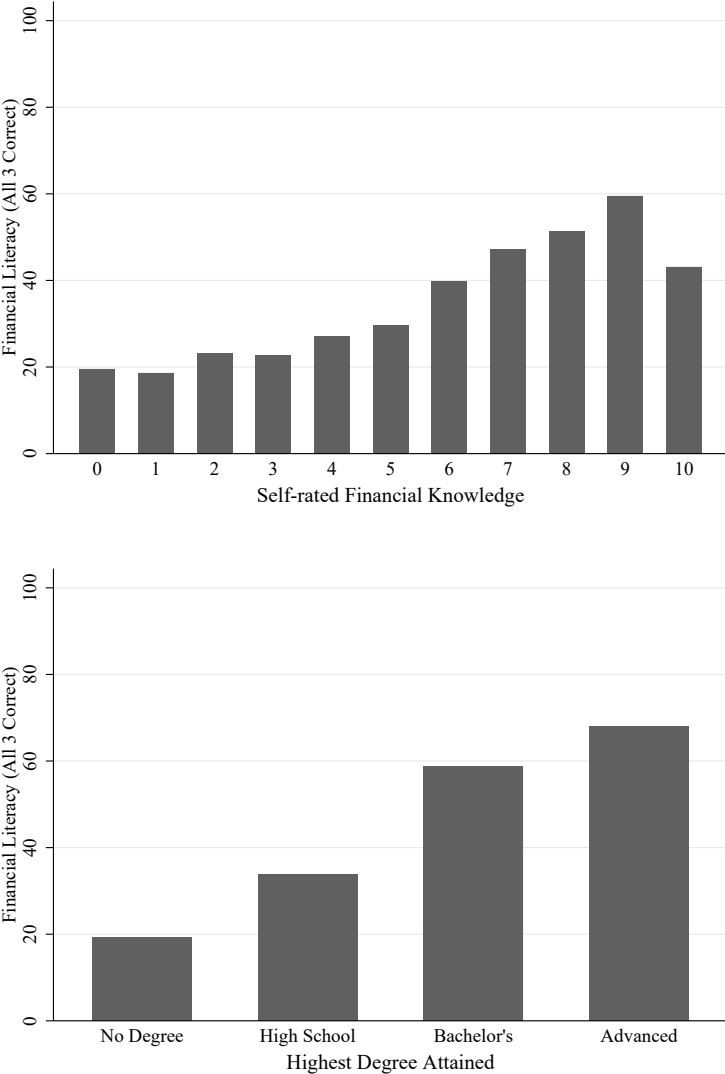
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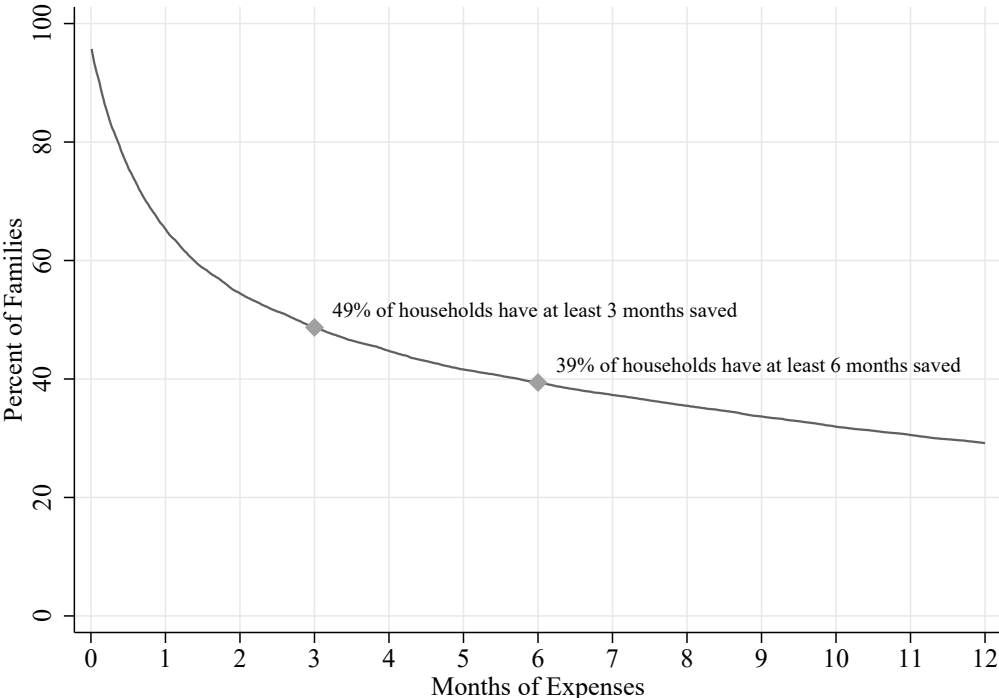
# Tables and Figures

Figure 1: Correlation Between Financial Literacy and Other Measures of Financial Knowledge



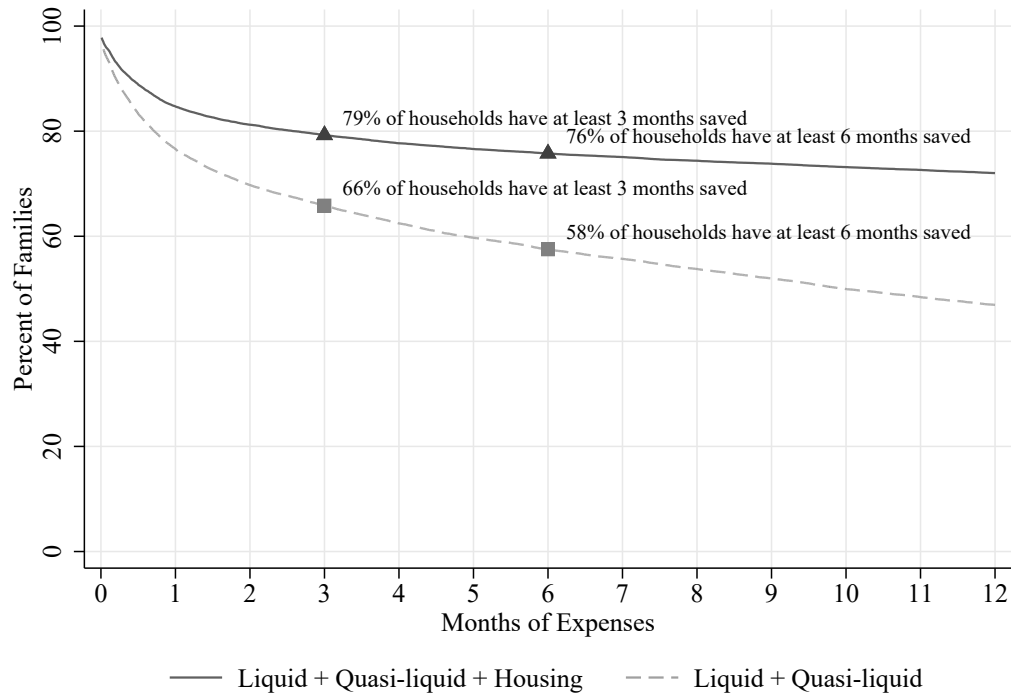
Note: Source 2016 and 2019 SCF.

Figure 2: Liquid Savings Expressed in Terms of Months of Families' Own Recurring Expenses



Note: Source 2016 and 2019 SCF.

Figure 3: Liquid, Quasi-liquid and Housing Wealth Expressed in Terms of Months of Families' Own Recurring Expenses



Note: Source 2016 and 2019 SCF.



Table 1: Summary Statistics

	Mean	SD
	(1)	(2)
Has 3 Months in Liquid Savings	0.487	0.500
Financial Literacy (All 3 Correct)	0.431	0.495
Financial Literacy (Fraction Correct)	0.724	0.287
Financial Literacy Diversification	0.617	0.486
Financial Literacy Interest	0.790	0.407
Financial Literacy Inflation	0.766	0.424
Ln(Normal Income)	10.996	0.961
Positive Income Shock	0.091	0.287
Small Negative Income Shock	0.071	0.256
Large Negative Income Shock	0.071	0.257
Expense Shock	0.240	0.427
Volatile Income	0.262	0.440
Risk Averse	0.573	0.272
Self-rated Financial Knowledge	0.719	0.222
No High School Diploma	0.100	0.301
Bachelor's Degree	0.223	0.416
Advanced Degree	0.150	0.357
Received Inheritance	0.218	0.413
Parent: No High School Diploma	0.194	0.395
Parent: Bachelor's Degree	0.300	0.458

Note: Source is 2016 and 2019 SCF. All estimates use SCF replicate weights. Standard deviations in parentheses.

Table 2: Liquid savings by demographic characteristics

Amount in liquid savings	At least 3 months of expenses (1)	At least 6 months of expenses (2)
All Families	49 %	39 %
Usual Income		
Income Quartile 1	26 %	21 %
Income Quartile 2	42 %	34 %
Income Quartile 3	51 %	40 %
Income Quartile 4	76 %	63 %
Age		
Under 35	31 %	18 %
Age 35-44	35 %	23 %
Age 45-54	39 %	28 %
Age 55-64	54 %	45 %
Age 65-74	73 %	69 %
Age 75+	76 %	72 %
Race		
White, non-Hispanic	58 %	48 %
Black/African-American, non-Hispanic	27 %	19 %
Hispanic or Latino	24 %	16 %
Other	46 %	35 %
Family Status (under 55 only)		
Single without Children	36 %	23 %
Married without Children	40 %	27 %
Married with Children	38 %	25 %
Single with Children	17 %	10 %
Marital Status		
Married	63 %	53 %
Separated	19 %	13 %
Divorced	38 %	30 %
Widowed	51 %	46 %
Never Married	32 %	22 %
Education		
No High School Diploma	24 %	20 %
High School Diploma or Equivalent	40 %	31 %
Bachelor's Degree	63 %	52 %
Advanced Degree	73 %	63 %
Employment Status		
Employed	42 %	30 %
Self Employed	61 %	51 %
Retired/Disabled	62 %	58 %
Not Working	24 %	19 %

Source is 2016 and 2019 SCF. All estimates use SCF replicate weights.

Table 3: Determinants of having three months of expenses in liquid savings

<i>Dep. Var.:Has 3 Months of Liquid Savings</i>	(1)	(2)	(3)	(4)	(5)	(6)
Financial Literacy (All 3 Correct)	0.185*** (0.012)	0.175*** (0.012)	0.113*** (0.012)	0.107*** (0.012)	0.086*** (0.012)	0.081*** (0.012)
Self-rated Financial Knowledge		0.187*** (0.026)	0.090*** (0.025)	0.074*** (0.025)	0.064*** (0.025)	0.064*** (0.024)
Ln(Normal Income)		0.171*** (0.007)	0.169*** (0.007)	0.169*** (0.007)	0.141*** (0.008)	0.137*** (0.008)
Positive Income Shock			0.047*** (0.016)	0.047*** (0.016)	0.046*** (0.016)	0.040*** (0.015)
Small Negative Income Shock			-0.076*** (0.020)	-0.076*** (0.020)	-0.072*** (0.019)	-0.074*** (0.019)
Large Negative Income Shock			-0.090*** (0.020)	-0.090*** (0.020)	-0.086*** (0.020)	-0.088*** (0.020)
Expense Shock			-0.032*** (0.012)	-0.032*** (0.012)	-0.032*** (0.012)	-0.034*** (0.012)
Volatile Income			-0.063*** (0.013)	-0.063*** (0.013)	-0.053*** (0.013)	-0.054*** (0.013)
No High School Diploma					-0.057*** (0.018)	-0.054*** (0.017)
Bachelor's Degree					0.113*** (0.014)	0.101*** (0.014)
Advanced Degree					0.112*** (0.016)	0.095*** (0.016)
Received Inheritance						0.078*** (0.012)
Parent: No High School Diploma						0.012 (0.014)
Parent: Bachelor's Degree						0.057*** (0.013)
N	12025	12025	11983	11983	11983	11983
R-Squared	0.252	0.259	0.329	0.338	0.348	0.353

Note: Source is 2016 and 2019 SCF. Estimated according to equation 1. All regressions include controls for gender, marital status, children, age, race, and year fixed effects. All estimates use SCF sampling weights. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01.

Table 4: Determinants of having three months of expenses in liquid savings by Normal Income Tercile

	Normal Income Tercile 1	Normal Income Tercile 2	Normal Income Tercile 3
<i>Dep. Var.:Has 3 Months of Liquid Savings</i>	(1)	(2)	(3)
Financial Literacy (All 3 Correct)	0.073*** ( 0.021)	0.067*** ( 0.020)	0.091*** ( 0.021)
N	3247	3187	5549
R-Squared	0.292	0.310	0.245
Dependent Variable Mean	0.286	0.468	0.712

Note: Source is 2016 and 2019 SCF. Estimated according to equation 1. All regressions include controls for income and income shocks, income volatility, self-rated financial knowledge, education, parent's education, receipt of inheritance, gender, marital status, children, age, race, and year fixed effects. All estimates use SCF sampling weights. The top tercile has more observations due to the sampling design of the SCF which oversamples the wealthiest families. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Table 5: Determinants of having three months of expenses in liquid savings by Illiquid Wealth Tercile

	Illiquid Wealth Tercile 1	Illiquid Wealth Tercile 2	Illiquid Wealth Tercile 3
<i>Dep. Var.:Has 3 Months of Liquid Savings</i>	(1)	(2)	(3)
Financial Literacy (All 3 Correct)	0.058*** ( 0.021)	0.058** ( 0.026)	0.084*** ( 0.019)
N	3465	2959	5559
R-Squared	0.199	0.221	0.212
Dependent Variable Mean	0.210	0.462	0.789

Note: Source is 2016 and 2019 SCF. Estimated according to equation 1. All regressions include controls for income and income shocks, income volatility, self-rated financial knowledge, education, parent's education, receipt of inheritance, gender, marital status, children, age, race, and year fixed effects. All estimates use SCF sampling weights. The top tercile has more observations due to the sampling design of the SCF which oversamples the wealthiest families. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Table 6: Robustness of Measures of Financial Literacy

	(1)	(2)	(3)	(4)	(5)
Financial Literacy (All 3 Correct)	0.081*** ( 0.012)	0.083*** ( 0.012)			
Self-rated Financial Knowledge	0.064*** ( 0.024)		0.064*** ( 0.024)	0.064*** ( 0.024)	0.076*** ( 0.025)
Financial Literacy (Fraction Correct)				0.128*** ( 0.020)	
Financial Literacy Diversification			0.055*** ( 0.010)		
Financial Literacy Interest			0.038*** ( 0.015)		
Financial Literacy Inflation			0.031** ( 0.012)		
N	11983	11983	11983	11983	12025
R-Squared	0.353	0.353	0.352	0.352	0.348

Note: Source is 2016 and 2019 SCF. Estimated according to equation 1. All regressions include controls for income and income shocks, income volatility, self-rated financial knowledge, education, parent's education, receipt of inheritance, gender, marital status, children, age, race, and year fixed effects. All estimates use SCF sampling weights. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Table 7: Relationship Between Financial Literacy and Alternative Financial Outcomes

	Regression Results on		R-squared	Mean
	Financial Literacy			
	(1)	(2)	(3)	
Ln(Months of Expenses in Liquid Savings)	0.285*** ( 0.031)	0.499	1.834	
Has 6 Months in Liquid Savings	0.079*** ( 0.010)	0.380	0.394	
Has 3 Months in Liquid + Quasiliquid	0.053*** ( 0.011)	0.340	0.658	
Has 6 Months in Liquid + Quasiliquid	0.066*** ( 0.012)	0.365	0.575	
Has 3 Months in Liquid + Illiquid	0.022** ( 0.009)	0.283	0.793	
Has 6 Months in Liquid + Illiquid	0.025** ( 0.010)	0.313	0.758	
Has 3 Months in Illiquid	0.022** ( 0.009)	0.307	0.738	
Has 6 Months in Illiquid	0.023** ( 0.009)	0.326	0.716	
Has 3 Months in Liquid (exclu. Stock)	0.071*** ( 0.011)	0.347	0.462	
Has 6 Months in Liquid (exclu. Stock)	0.067*** ( 0.010)	0.374	0.365	
Has 3 Months in Liquid (exclu age 55+)	0.088*** ( 0.016)	0.272	0.348	
Has 6 Months in Liquid (exclu age 55+)	0.083*** ( 0.013)	0.244	0.348	

Note: Source is 2016 and 2019 SCF. Estimated according to equation 1. All regressions include controls for income and income shocks, income volatility, self-rated financial knowledge, education, parent's education, receipt of inheritance, gender, marital status, children, age, race, and year fixed effects. All estimates use SCF sampling weights. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

# Appendix to “The Smart Money is in Cash? Financial Literacy and Liquid Savings Among U.S. Families”

## 1 Financial Literacy Battery

The three questions are phrased as follows with the correct answer emphasized in bold:<sup>30</sup>

1. Financial Literacy Diversification: 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?  
  
(a) True                      (b) **False**                      (c) Don’t know                      (d) Refused
2. Financial Literacy 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: more than \$102, exactly \$102, or less than \$102?  
  
(a) **More than \$102**                      (d) Don’t know  
(b) Exactly \$102                      (e) Refused  
(c) Less than \$102
3. Financial Literacy Inflation: Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than today, exactly the same as today, or less than today with the money in this account?

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<sup>30</sup>For these purposes, we consider “don’t know” as an incorrect answer choice.

(a) More than today

(d) Don't know

(b) Exactly the same as today

(e) Refused

(c) **Less than today**



## 2 Tables and Figures

Table A1: Monthly Expenses by Income Quartile

	Income Quartile 1	Income Quartile 2	Income Quartile 3	Income Quartile 4
	(1)	(2)	(3)	(4)
Housing	656	907	1330	2793
	720	720	720	720
Vehicle	218	391	535	695
	229	229	229	229
Food	429	576	729	1093
	296	296	296	296
Technology	178	195	208	221
	38	38	38	38
Healthcare	230	365	445	512
	230	230	230	230
Debt	65	139	248	563
	320	320	320	320
Total	1774	2573	3494	5877
	1081	1081	1081	1081

Note: Source is 2016 and 2019 SCF. All estimates use SCF replicate weights. All numbers reported in 2019 dollars

Table A2: Mean and Median Amount in Liquid Savings by Type

	Mean	Median
	(1)	(2)
All families		
Transaction Accounts	41	5
Investment Accounts	182	0
Families Less Than 3 Months in Liquid Savings		
Transaction Accounts	3	1
Investment Accounts	0	0
Families with 3-6 Months in Liquid Savings		
Transaction Accounts	14	12
Investment Accounts	3	0
Families with More Than 6 Months in Liquid Savings		
Transaction Accounts	98	29
Investment Accounts	462	28

Note: Source is 2016 and 2019 SCF. All estimates use SCF replicate weights. All numbers reported in thousands of 2019 dollars

Table A3: Determinants of having three months of expenses in liquid savings

<i>Dep. Var.: Has 3 Months of Liquid Savings</i>	(1)
Financial Literacy (All 3 Correct)	0.081*** ( 0.012)
Self-rated Financial Knowledge	0.062*** ( 0.024)
No High School Diploma	-0.054*** ( 0.017)
Bachelor's Degree	0.101*** ( 0.014)
Advanced Degree	0.095*** ( 0.016)
Positive Income Shock	0.040*** ( 0.015)
Small Negative Income Shock	-0.074*** ( 0.019)
Large Negative Income Shock	-0.087*** ( 0.020)
Expense Shock	-0.034*** ( 0.012)
Volatile Income	-0.054*** ( 0.013)
Ln(Normal Income)	0.137*** ( 0.008)
Received Inheritance	0.078*** ( 0.012)
Parent: No High School Diploma	0.012 ( 0.014)
Parent: Bachelor's Degree	0.057*** ( 0.013)

Table A3 Continued: Determinants of having three months of expenses in liquid savings

<i>Dep. Var.:Has 3 Months of Liquid Savings</i>	(1)
Male	0.038*** ( 0.009)
Married	0.085*** ( 0.015)
Has Dependent Child	-0.175*** ( 0.030)
Married * Has Dependent Child	0.051** ( 0.021)
Age 35-44	-0.017 ( 0.017)
Age 45-54	-0.006 ( 0.017)
Age 55-64	0.128*** ( 0.016)
Age 65-74	0.317*** ( 0.017)
Age 75+	0.389*** ( 0.020)
Black/African-American, non-Hispanic	-0.091*** ( 0.013)
Hispanic or Latino	-0.073*** ( 0.018)
Other	0.005 ( 0.018)
2019	0.005*** ( 0.002)
N	11983
R-Squared	0.353

Note: Source is 2016 and 2019 SCF. Estimates according to equation 1. All estimates use SCF sampling weights. Standard errors adjusted for multiple imputation and sampling variability in parentheses. \*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .