

Financial Literacy and Saving Behaviors of Households

Zhiheng Jiang^{1,a,*}

¹University of Southern California, 3551 Trousdale Pkwy, University Park, Los Angeles, CA, US
a. zhihengj@usc.edu
*corresponding author

Abstract: This paper studies the relationship between financial/numeric literacy and household saving and investment behaviors using the New York Fed's Survey of Consumer Expectations. Using a panel dataset and a regression analysis, the study finds that although overall propensities to save, measured by saving rate and savings-to-wealth ratio, does not show a significant correlation with literacy measures, individuals' portfolio choices between risk-free and risky assets are indeed affected by both literacy measures. The research indicates that individuals who report higher self-rated financial literacy and attain higher numeracy scores tend to allocate a more substantial portion of their savings into stocks. By contrast, they are inclined to hold a smaller portion of their wealth in risk-free liquid assets, such as checking accounts. More particularly, individuals with higher numeracy scores tend to allocate approximately 5.384% greater portion of their investments into stocks while simultaneously reducing their investments in checking accounts by 4.251%. Similarly, those with higher financial literacy tend to demonstrate an average increase of 10.085% in stock investments, coupled with a decrease of 12.506% in checking account investments. Notably, these effects are separate from influences of other factors like education, gender, and income.

Keywords: Financial Literacy, Numeracy, Saving, Wealth, Stock Investment

1. Introduction

Why do some households save more and others save less? Why do some individuals heavily invest in stocks and others do not? Understanding these questions is not only important to explain the drivers of wealth inequality but also critical to realistically modeling household consumption and saving decisions in any micro-founded macroeconomic and financial model. Furthermore, it affects our understanding of how monetary and fiscal policies affect macroeconomic dynamics over business cycles.

The existing literature has shown that household saving and investment decisions are driven by a long list of factors such as income, risks, macroeconomic conditions, culture, institutions, time and risk preferences, and others. This paper empirically explores the role of financial literacy (FL) and numeracy as one additional factor using a novel dataset of a representative survey of U.S. households that directly measures the saving/investment behaviors of the individuals and various measures of literacy at the individual level.

There are two major findings in this paper. First, FL and numeracy are shown to have no significant impact on the overall saving behaviors of individuals. This is robust to measuring saving behaviors differently as saving rate (saving to income) or savings-to-wealth ratio (the ratio of total savings and

investment to the net wealth of the households excluding housing wealth). Second, in the meantime, higher FL and numeracy do increase the share of stock investment versus the liquid savings in checking accounts. This evidence, taken together, suggests that FL affects household saving/investment decisions mostly through the risk-taking channels. This provides one possible explanation for the observed heterogeneity in returns in risky assets as a main driver of wealth inequality as shown in Fagereng et al. [1,2].

What distinguishes this paper from many existing studies that emphasize the role of financial literacy is twofold. First, this paper focuses on both overall saving behaviors and portfolio allocation between various assets of different risks, both of which are shown to be critical to explaining the drivers of wealth inequality. The mechanisms in which financial literacy affects both are not entirely the same in theory. In particular, the overall saving propensity mostly reflects the household's resource-allocation choices between today and tomorrow (the "inter-temporal substitution" channel) and the precautionary saving decisions, i.e. "saving for the rainy day" (the "precautionary saving motive" channel). In contrast, the portfolio choice, i.e. stock market participation, and investment, are more likely to be tied to decisions involving managing risks via diversification.

Separately identifying the effects of FL on these decisions is, in general, difficult, because the two decisions are interdependent on each other. To understand this better, imagine an economic researcher who observes two individuals: one with high wealth and FL and the other with low wealth and low FL. To the extent that FL positively affects both the overall tendency of saving and financial market participation, it is hard to disentangle the two effects by just observing the total wealth. The survey data used in this paper, however, has richer information than most of the existing studies, as it separately reports both the total wealth and the portfolio shares to each class of assets. This allows me to separately examine the two channels.

Second, this paper explores two subtly different measures of financial literacy from the existing literature that is based on the "big three" questions¹: one is self-reported financial literacy, which may very likely reflect a combination of objective financial sophistication and subjective confidence in financial decisionmaking; the other is the objectively measured numeracy that is shown to be highly correlated to but different from the classical definition of financial literacy [3]. As to the first measure, to the extent that it is the self-perceived FL that directly drives the decisions of the individuals, showing such evidence is a contribution to the literature. As to the second measure, this paper shows directly that numeracy, as part of the necessary skillset to manage finance decisions, also matters for risky investment decisions.

2. Literature review

This paper is related to three strands of literature in economics. The most related to this paper is the literature that examines the effects of financial literacy and numeracy on household saving and investment behaviors. For instance, Van Rooij, Lusardi, and Alessie shows that Dutch households with lower financial literacy measured by the "big three" are less likely to participate in the stock market [4,5]. Lusardi and Mitchell thoroughly surveys similar evidence in different countries and different demographic groups [6]. This paper builds on this literature and finds similar evidence that portfolio share allocated to stock investment is higher for households with both higher numeracy scores and self-reported financial literacy. But this paper also provides complementary evidence that this is accompanied by a lower share allocated to risk-free investments such as deposits in checking accounts. Besides, the paper focus on not only investment choices but also the overall saving

¹ The "big three" refers to being able to differentiate nominal versus real variables, being able to compound interest rate and risk diversification.

behaviors of the individuals. Another advantage of this paper compared to some of these studies is that I can control for time-fixed effects due to the panel structure of the survey.

Second, it is related to the literature that studies the impacts of financial literacy on various other economic decisions, such as indebtedness, retirement planning, and insurance demand [7-9]. Some of the other papers, focus on the interaction effect of financial literacy and demographics, most notably, gender [10,11]. This paper studies the impacts of FL and numeracy on the saving and portfolio choices conditional on controlling for a wide range of demographics, and individual fixed-effects.

Third, the paper is related to a large number of empirical studies that explore the various drivers of saving and investment behaviors, ranging from risks, preferences, culture, experience, cognitive abilities, social influences, and others [12-16]. This paper shows self-reported financial literacy and objectively measured numeracy as another important determinant of saving behaviors.

3. Data, variables and density estimation

3.1. Basic information

The data used for this paper were obtained from three modules of the Survey of Consumer Expectation (SCE) conducted by the New York Fed, including the core module, the household spending survey (HSS), and the household finance survey (HFS). SCE is a monthly online survey for a rotating panel of around 1,300 household heads during the period June 2013 to July 2021, or 97 months². The household spending survey (HSS) and household finance survey (HFS) are supplementary submodules with specific topics, and a subsample of households is surveyed repeatedly every four quarters. Overall, around 2,000 households are included in the sample for the analysis.

3.2. The variables used in this paper

This paper primarily uses two measures of saving behaviors, primarily. They are saving rate and saving-to-wealth ratio. Both variables are calculated based on the self-reported savings by the households in the HFS.

In particular, the survey asks "*During the last 12 months, about how much more did you and your spouse/partner add to your investments or savings than you withdraw from them?*". This gives us the total saving of the past year. Also, it asks "*Please include money from all jobs, net income from business, farm or rent, pensions, interest on savings or bonds, dividends, social security income, unemployment benefits, Food Stamps, workers compensation or disability benefits, child support, alimony, scholarships, fellowships, grants, inheritances and gifts, and any other money income received by members of your household who are 15 years of age or older*", which can be interpreted as the disposable income of the households. With these two, the saving rate is calculated as the ratio of savings to the income of the past year.

$$\text{SavingRate} = \frac{\text{Saving}}{\text{Disposable Income}} \quad (1)$$

Another important variable is the savings-to-wealth ratio, total savings (the stock of "savings and investment") divided by net wealth which is derived from total savings & investments less total debt. The survey question that asks for total investments and total debt respectively are the following: "*Approximately what is the total current value of your and your spouse's/partner's savings and*

² Armantier et al. (2017) discusses in great detail the survey methodology and design of the SCE.

investments (such as checking and savings accounts, CDs, stocks, bonds, mutual funds, Treasury bonds), excluding those in retirement accounts?" and "Next consider all outstanding debt you and your spouse/partner have, including balances on credit cards (including retail cards), auto loans, student loans, other personal loans, as well as medical or legal bills, but excluding all housing-related debt (such as mortgages, home equity lines of credit, home equity loans).

$$\text{Net wealth} = \text{Total Savings \& Investment} - \text{Total Debt} \quad (2)$$

$$\text{Saving2Wealth} = \frac{\text{Total Saving and Investment}}{\text{NetWealth}} \quad (3)$$

Financial literacy is evaluated from two perspectives. The first measure is in a self-reported manner as the survey asks: *"How would you rate your knowledge about your retirement and saving and investment account(s)?"* This is further labeled as self-rated financial literacy in the subsequent sections of the paper. The second measure is the score on a numeracy test in which participants were asked 7 questions about how they use numbers in their daily lives. One example question is the following: *"In a sale, a shop is selling all items at half price. Before the sale, a sofa costs \$300. How much will it cost in the sale?"*

In terms of portfolio measures, this paper mainly explores individuals' decisions between stocks and checking accounts, with the former representing high-risk assets and the latter low-risk assets. The survey question is presented as: *"What proportion of the money in your and your spouse's/partner's saving and investment accounts (excluding funds in retirement accounts) is invested in Checking/saving accounts; Treasury Bills/CDs/Money Markets/Money Market Mutual Funds; Treasury Inflation-Protected Securities (TIPS)/TIPS Index Funds; Bonds/Bond mutual funds (including US government bonds, municipal bonds, corporate bonds); Stocks/Stock mutual funds; Real Estate Investment Trusts (REITs)/REIT Index Funds."* For the purpose of this paper, the main focus lies on the allocation of investment accounts into stock and checking accounts.

Finally, some demographic variables are participants' age, gender, education, employment status, and number of homes. Other control variables include individuals' risk attitudes³, whether they make financial decisions independently, whether they have a family budget, and change in spending⁴.

4. Basic Facts about the Relationship between Financial Literacy and Saving Behaviors

4.1. Overall saving behaviors

First comes the relationship between self-rated financial literacy and net wealth, which is shown by the left plot in Figure 1. A positive relationship between financial literacy and net wealth can be identified, meaning that people with higher financial literacy tend to have higher net wealth. One potential reason for this upward trend could be that people with higher financial literacy are more knowledgeable in investments. As a result, they are more likely to invest and make successful investments, increasing their monetary value. It could also be the case that these people are more sensitive to numbers, money, and news, all are factors that could provide them with chances to increase their wealth.

By the same token, the plot on the right illustrates a huge difference in net wealth between people with high and low numeracy test scores. It can be seen that people who scored high on the numeracy test have an average net wealth of \$191812.91 as compared to only the average of \$27592.27 for people who scored poorly on the numeracy test. Since numeracy is related to math ability, which is

³ The question used to measure risk attitude is *"How would you rate your willingness to take risks regarding financial matters?"*

⁴ The question used to measure the change in spending is *"Would you describe your current monthly household income (before taxes) as more or less constant, slightly variable, somewhat variable or highly variable from month to month?"*

crucial in making financial decisions, a reasonable hypothesis could be that people with low numeracy might have a weaker performance in financial activities, resulting in less net wealth. It could also be the case that a low numeracy score is correlated to incapability in other fields as well, leading to failures in matters not limited to finance and resulting in a general low net wealth.

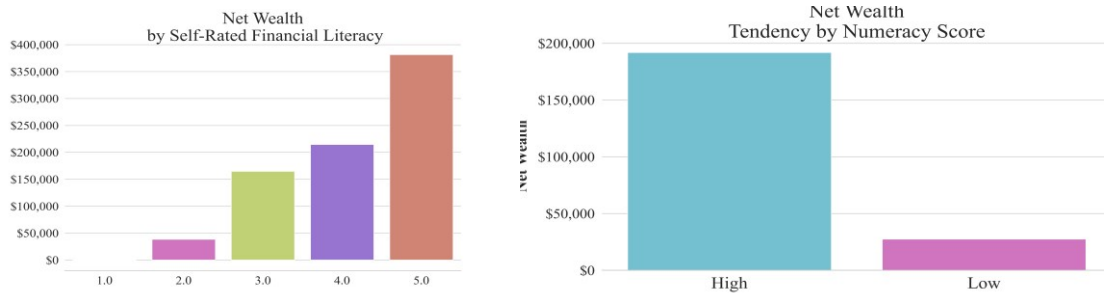


Figure 1: Net Wealth by Numeracy and Self-rated Financial Literacy.

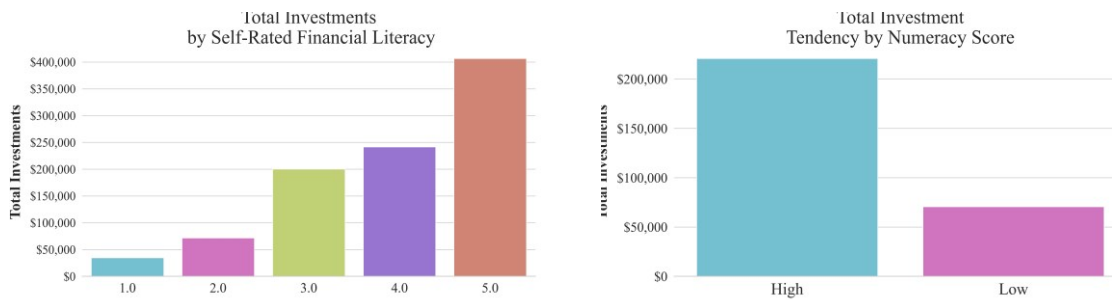


Figure 2: Total Investments by Numeracy and Self-rated Financial Literacy.

Besides financial literacy and numeracy’s impact on net wealth, the left plot in Figure 2 explores the correlation between self-rated financial literacy and total investments. As depicted by the chart, people with the lowest financial literacy (1) have an average investment of \$34682.03 and as financial literacy increases, people’s total investments increase as well, reaching \$406555.19 as financial literacy touches its maximum. Nevertheless, it needs to be careful when analyzing this positive correlation because net wealth also increases with financial literacy and total investments are directly linked to net wealth.

The plot on the right presents the correlation between total investments and scores on the numeracy test. Similar to the pattern shown on the left, people who score high on the numeracy test have an average total investment of \$220,807, which is much higher than the average of \$70538 total investment for people who with a low score.

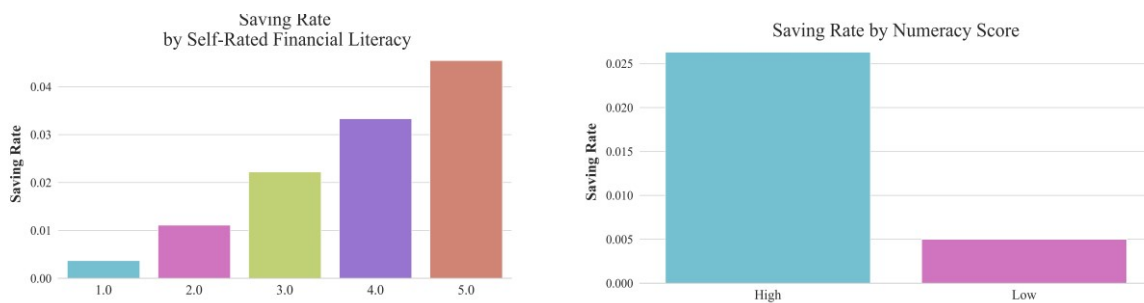


Figure 3: Saving Rate by Numeracy and Self-rated Financial Literacy.

Thus far, it's evident that people with higher financial literacy and numeracy have higher monetary values and investments. Therefore, an interesting question to ask is whether people with more financial knowledge and higher numerical literacy will exhibit more saving behaviors. To answer the question while avoiding potential bias incurred by income effect, it is essential to normalize saving and investment to people's income and net wealth, Figure 3 identifies the correlation between saving rate and financial literacy as well as numeracy. From the left chart, it is clear that people with minimum financial literacy (1) have a median saving rate as low as 0.5%. On the other hand, people with the highest financial literacy (5) have a high median saving rate of 2.63%. Besides that, the overall trend shows a gradual increase in saving rate as financial literacy increases, indicating a positive relationship. A probable hypothesis is that since people with higher financial literacy know more about finance, math, and investment, they are more confident and comfortable in making financial investments, explaining their higher saving rates. By contrast, people with low financial literacy probably do not have the same awareness, so they not only don't know how to make investments with positive expected returns but also don't want to save.

By the same token, the graph on the right also identifies the same tendency for saving rate and numeracy test scores. This sharp contrast between people who score high on the numeracy test (2.63%) and low on the numeracy test (0.5%) further supports the hypothesis that people with better calculation ability save more. However, merely using saving rate as a measure of people's saving behavior could be problematic because people's net wealth and total investments differ by financial literacy and numeracy score as well.

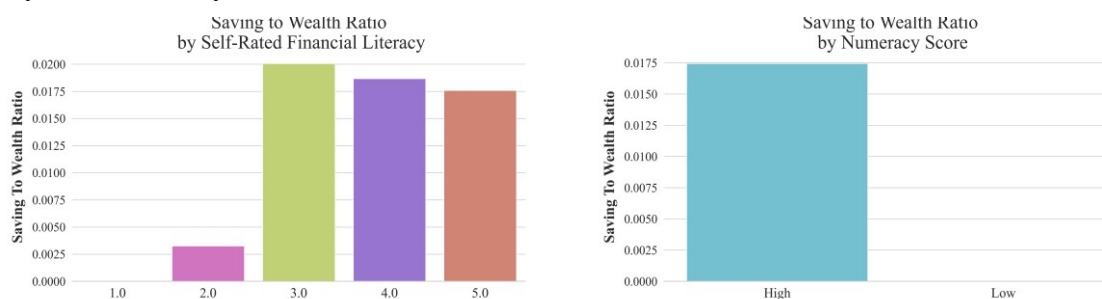


Figure 4: Saving to Wealth Ratio by Numeracy and Self-rated Financial Literacy.

Compared to the saving rate, the saving-to-wealth ratio might be a more objective indicator of people's saving behavior, so Figure 4 highlights the correlation between saving-to-wealth ratio and financial literacy as well as numeracy test scores. Looking at the first plot, although not a completely smooth upward trend, when examining people's saving-to-wealth ratio and financial literacy, it's clear that people with low financial literacy are correlated with a low saving-to-wealth ratio, a median of 0.34%, and people with high financial literacy tend to have a much higher saving to wealth ratio (4.55%). Notice how this pattern is similar to the pattern for saving rate. An identical trend could be found in the right chart which relates saving-to-wealth ratio with numeracy scores. It's obvious that people who score high on the numeracy test have a much higher median saving-to-wealth ratio (1.82%), while people who score poorly on the test only have a median ratio of 0.02%. Such a huge difference combined with previous graphs reinforces the hypothesis that people with higher financial literacy and mathematic capacity indeed save more. However, before drawing any conclusions, it's necessary to rule out potential confounds.

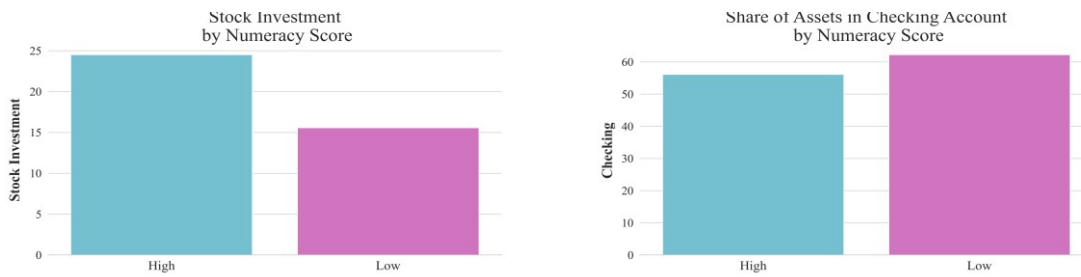


Figure 5: Saving to Wealth Ratio by Numeracy and Self-rated Financial Literacy.

4.2. Portfolio choices

Besides looking at people’s saving behaviors from a macro perspective, it is also worth examining them on a more detailed scale, such as studying differences in people’s portfolio choices. The first plot in Figure 5 presents people’s share of stock investment by their self-rated financial literacy scores. The scale of self-rated financial literacy scores ranged from 1, very poor, to 5, excellent. The pattern revealed by the graph is that as financial literacy scores rise, stock investment rises as well, implying a positive correlation between stock investment and financial literacy. One explanation could be that people with higher financial literacy are more confident, thus trying to pursue the greatest possible return. As a result, these people, believing that they are knowledgeable in the field of investment, are more willing to take risks by investing in stocks as higher risk is related to higher expected returns.

The second plot in Figure 5 presents the relationship between the score on the numeracy test and the share of assets in a checking account. It is shown that people who scored low on the numeracy tests tend to have a higher share of assets in the checking accounts (62.22%), and vice versa (56.11%). This could be attributed to the fact that people with weaker calculation abilities are more afraid of risk and are not confident in calculating the expected return on riskier assets. Thus, they are more willing to save their money in a checking account as it is relatively safer and doesn’t require mass calculation when considering return.

The first plot in Figure 6 presents people’s share of stock investment by their self-rated financial literacy scores. The scale of self-rated financial literacy scores ranged from 1, very poor, to 5, excellent. The pattern revealed by the graph is that as financial literacy scores rise, stock investment rises as well, implying a positive correlation between stock investment and financial literacy. One explanation could be that people with higher financial literacy are more confident, thus trying to pursue the greatest possible return. As a result, these people, believing that they are knowledgeable in the field of investment, are more willing to take risks by investing in stocks as higher risk is related to higher expected returns.

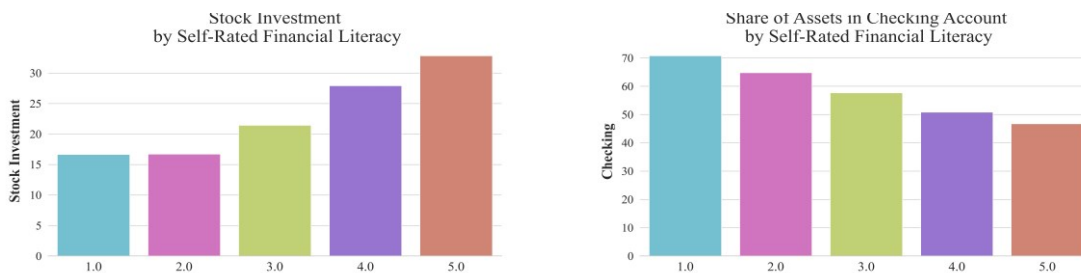


Figure 6: Portfolio Share by Self-rated Financial Literacy.

The second plot in Figure 6 describes the relationship between the share of assets in checking account and self-rated financial literacy. It’s shown that people with low financial literacy have an average share of checking of 70.76% and gradually decrease to 46.72% when financial literacy

reaches 5. This downward trend illustrates that as financial literacy increases, people’s investment takes less in the form of checking. One potential reason could be that people with more knowledge about investment want to seek maximum profit and are not satisfied by the little return generated by checking accounts.

5. Regression Analysis

5.1. Empirical specification

Merely looking at the correlation between people’s saving behaviors and financial literacy as well as numeracy isn’t enough to draw any conclusion for there are other factors that need to be controlled. In order to isolate the effect of financial literacy and numeracy, regression analysis is implemented because it helps rule out confounding variables and examine how people’s saving behaviors change as financial literacy changes, *ceteris paribus*.

Therefore, we proceed to inspect such a relationship conditional on other variables using linear regression. The general regression specification of this paper is as follows in Equation 4. The dependent variables are various measures of saving behaviors as defined in the previous section. The key variable of interest for this paper is the literacy $LIT_{i,t}$, which measures the financial or numeric literacy of the households. Besides, we control for other “independent” variables, $M_{i,t}$, including all the observable household-specific variables that we think may drive differences in saving behaviors, such as age, age square, income, gender, education, etc. Besides, when possible, we control for both individual fixed effects ω_i and time fixed effects η_t .

$$Y_{i,t} = \alpha + \beta LIT_{i,t} + \Theta M_{i,t} + \omega_i + \eta_t + \epsilon_{i,t} \quad (4)$$

5.2. Results

Table 1: Results for Numeracy Score.

	Saving-to-wealth	Saving-to-wealth	Stock	Stock	Checking	Checking
Age	0.866	-0.517	0.230***	-0.178	-0.573***	-0.175
	(0.774)	(5.445)	(0.045)	(0.305)	(0.056)	(0.377)
Age Squared		0.008		0.004		-0.003
		(0.053)		(0.003)		(0.004)
Low Numeracy	-16.072	-15.972	-7.239***	-5.384***	5.782***	4.251*
	(29.952)	(30.617)	(1.750)	(1.744)	(2.160)	(2.168)
Male	17.656	19.283	5.116***	2.435*		
	(23.256)	(23.934)	(1.352)	(1.358)		
High School Education	-15.457	-17.466	-9.599***	-6.309***	16.188***	14.489***
	(41.484)	(42.269)	(2.439)	(2.434)	(3.070)	(3.045)
Some College Education	-22.981	-21.886	-5.509***	-2.985**	8.270***	6.539***
	(25.954)	(26.651)	(1.480)	(1.489)	(1.862)	(1.870)
Logged Net Wealth		-78.827		41.819***		-83.106***
		(139.140)		(8.687)		(10.971)
Logged Income		4.458		1.438**		-1.453**

Table 1: (continued).

		(10.185)		(0.584)		(0.726)
Unemployed		10.773		5.884		
		(78.055)		(4.566)		
Number of Homes		-10.069		0.513		
		(19.939)		(1.121)		
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1861	1861	2424	2424	2424	2424
Adjusted R^2	-0.000	-0.003	0.036	0.077	0.052	0.077

*p<0.1; **p<0.05; ***p<0.01

Table 1 reports the regression results first with a focus on the effects of numeracy on saving behaviors and portfolio choices. The first two columns describe the numeracy score's effect on the saving-to-wealth ratio. The reason for choosing the saving-to-wealth ratio over the saving rate in representing people's saving behavior is that the saving rate could be biased for the incomes of people differ greatly. Also, income could fluctuate largely, further affecting the saving rate's reliability and validity. In column 1, only basic demographics are controlled in the regression, such as age gender, and education. There is no significant effect of the numeracy score on the saving-to-wealth ratio. In column 2, besides controlling demographic factors, people's net wealth, income, number of homes, and employment status are also added to the regression. The reason for this is that people might differ in their monetary value at the outset, meaning that their ability to save is also different, which can create bias in results when analyzing the effect of numeracy score on saving-to-wealth ratio if not accounted for. Employment status is controlled because it can have an impact on net wealth and income as well as people's spending and saving behavior. The number of homes serves as a control as well because people could invest in homes, which is not included in the saving-to-wealth ratio. However, even if more controls are added, no significance is found here, meaning that after ruling out confounding factors, the effect of numeracy score alone on the saving-to-wealth ratio is trivial.

Columns 3 and 4 of Table 1 regress the numeracy score on the proportion of stock investment in people's portfolios. In the baseline result shown in column 3, even though only basic demographics are controlled, there is still a significant effect of the numeracy score on stock investment. More specifically, people with low numeracy tend to invest 7.266% less in stocks than people with high numeracy scores. However, in order to better control for extraneous variables, people's net wealth and income are also controlled in Column 4. This is to address the positive relationship between net wealth and income and numeracy score as a higher numeracy score is correlated with higher net wealth and income. What's more, employment status is also included in the regression because it can have a potential effect on people's net wealth and income, which directly influences people's stock investment. Additionally, the number of homes is incorporated in the regression as well to address any potential difference in saving behavior for people with more homes. After adding more terms, the effect of numeracy score on the proportion of stock investment in the portfolio is still significant, and a coefficient of -6.1% implies that people who scored high on the numeracy test tend to have 6.1% more percent stock investments, although slightly smaller than the coefficient before adding controls.

The last two columns of Table 1 emphasize the numeracy score's effect on the investment in checking accounts. Column 5 controls only simple demographic features, but still comes up with a significant result. A coefficient of 5.665 means that people with low numeracy score shows 5.665% more investment in their checking accounts. After adding more controls such as net wealth and income values in Column 6, significance still appears, and the coefficient 5.229 is similar to the previous coefficient. The result shows that people with low numeracy scores have an average of 5.229

percent more investment in checking accounts. This regression result is in line with the stylized fact discovered before, jointly confirming a negative relationship between mathematical literacy and the share of the portfolio in checking accounts.

Table 2: Results for Financial Literacy.

	Saving-to-wealth	Saving-to-wealth	Stock	Stock	Checking	Checking
Age	0.839	-0.579	0.211***	-0.170	-0.534***	0.052
	(0.778)	(5.440)	(0.045)	(0.312)	(0.057)	(0.389)
Age Squared		0.009		0.003		-0.006
		(0.053)		(0.003)		(0.004)
FL=5	61.950	57.202	11.462***	10.085***	-14.745***	-12.506***
	(62.569)	(63.244)	(3.677)	(3.692)	(4.622)	(4.625)
FL=4	-24.069	-29.773	7.014**	6.614**	-12.154***	-11.352***
	(56.497)	(57.010)	(3.288)	(3.291)	(4.138)	(4.128)
FL=3	-6.848	-10.939	1.585	1.473	-6.688*	-6.510
	(54.385)	(54.736)	(3.181)	(3.169)	(4.004)	(3.970)
FL=2	-3.576	-5.739	-1.989	-1.892	-3.073	-3.342
	(58.016)	(58.218)	(3.369)	(3.340)	(4.240)	(4.182)
Male	16.724	19.383				
	(23.873)	(24.108)				
High School Education	-15.758	-17.437	-9.594***	-8.074***	14.926***	12.583***
	(41.376)	(41.802)	(2.436)	(2.422)	(3.060)	(3.035)
Some College Education	-22.693	-24.165	-4.811***	-3.013**	6.940***	4.093**
	(26.194)	(26.753)	(1.508)	(1.520)	(1.895)	(1.912)
Logged Net Wealth		-87.538		44.383***		-75.961***
		(138.792)		(8.754)		(10.967)
Logged Income		4.452		2.223***		-3.535***
		(10.024)		(0.596)		(0.993)
Unemployed		13.906		6.492		
		(77.930)		(4.601)		
Number of Homes		-7.769		1.136		
		(19.769)		(1.133)		
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1861	1861	2386	2386	2376	2376
Adjusted R^2	0.000	-0.002	0.035	0.058	0.058	0.089

Note: FL stands for financial literacy which takes the value of 1 to 5, from low to high. *p<0.1;

p<0.05; *p<0.01

Table 2 reports the regression results with a focus on the effects of self-rated financial literacy on saving and portfolio choices. The motivation is that although numeracy is an important correlated measure to financial literacy, it may not correspond to the true level of financial literacy that affects an individual's financial decisions. In addition, self-reported financial literacy also captures the subjective confidence of individuals regarding their own capacity for financial decision-making. Column 1 is the baseline result for the saving-to-wealth ratio and financial literacy where only basic

demographics are included. No significance is found, and this finding persists even after more control variables are introduced. Logged net wealth and income, combined with the number of homes and employment status, all could have an influence on people's saving tendencies. However, the effect of financial literacy is still minuscule after all.

Columns 3 and 4 of Table 2 demonstrate financial literacy's effect on stock investment. In Column 3, only demographic variables are included but the result indicates a strong significant impact of financial literacy in stock investment. More specifically, a self-rated financial literacy of 5 (highest), compared to a financial literacy of 1 (lowest), suggests an 11.462% greater allocation to stock holding within a portfolio. In Column 4, as more controls are added, financial literacy's effect on stock preference is still very significant, but the coefficient becomes a little smaller, which means people with a financial literacy of 5 have 10.085% more proportion of stock in their investment portfolio than people with the lowest financial literacy.

The last pair of columns in Table 2 examine the implication of financial literacy on investment in checking accounts. Similar to the previous 2 columns, the last 2 columns also go as one basic regression followed by another with more controls. In Column 5, it is shown that financial literacy has a strong effect on checking account investments, and the coefficient of -14.745 means that people with the highest financial literacy (5) have 14.745% less proportion of their portfolio in checking accounts than people with the lowest financial literacy. Column 6 adds logged net wealth and logged income into the regression and yields similar results. Financial literacy's influence on checking account investment is still vigorously significant.

6. Conclusion

Using a large representative survey of U.S. households, this paper empirically shows that self-reported FL and numeracy increase households' tendency toward risky asset investment in the form of stocks relative to risk-free savings, yet has no significant effects on overall saving behaviors conditional on other important factors such as income and education. Such an effect is best interpreted as a combination of objective financial sophistication of individuals and subjective confidence involving financial decision-making.

Many questions remain unresolved in this paper yet are interesting to future research. For instance, how is financial literacy related to macro/microeconomic expectations? This question can be answered with the same dataset used in this paper. Furthermore, is financial literacy/numeracy a persistent personal trait or a time-varying factor that changes through learning and change in attitude? Finally, how to separate the effect of objective financial literacy and subjective confidence related to financial literacy on portfolio choice is another interesting question worth investigating.

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