The Geography of Financial Literacy

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The Geography of Financial Literacy:
A Report

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Abstract

This report explores how well equipped today's households are to make complex financial decisions in the face of often high-cost and high-risk financial instruments. Specifically we focus on financial literacy. Most importantly, we describe the geography of financial literacy, i.e., how financial literacy is distributed across the fifty US states. We describe the correlation of financial literacy and some important aggregate variables, such as state-level poverty rates. Finally, we examine how much differences in financial literacy can be explained by states' demographic and economic characteristics.

To assess financial literacy, five questions were added to the 2009 Financial Capability Study, covering fundamental concepts of economics and finance encountered in everyday life: simple calculations about interest rates and inflation, the workings of risk diversification, the relationship between bond prices and interest rates, and the relationship between interest payments and maturity in mortgages. We constructed an index of financial literacy based on the number of correct answers provided by each respondent to the five financial literacy questions.

The financial literacy index reveals wide variation in financial literacy across states. Much of the variation is attributable to differences in the demographic make-up of the states; however, a handful of states have either higher or lower levels of financial literacy than is explained by demographics alone. Also, there is a significant correlation between the financial literacy of a state and that state's poverty level. The findings indicate directions for policy makers and practitioners interested in targeting areas where financial literacy is low.

Executive Summary

In the last few decades, financial markets around the world have become increasingly accessible to the "small investor" as new products and financial services have come on the market. Nonetheless, many of these products are complex and difficult to grasp, especially for financially unsophisticated investors. At the same time, changes in the pension landscape are encouraging increased reliance on the individual, particularly in the United States. The transition to the defined contribution (DC) retirement saving model has the advantage of permitting more worker flexibility and labor mobility than in the past, yet it also imposes on employees a greater responsibility to save, invest, and decumulate retirement wealth sensibly. Furthermore, the spread of DC plans means that workers today are directly and immediately exposed to financial market risks.

How people borrow money and manage their liabilities has also undergone major change of late. Prior to the current financial crisis, consumer credit had expanded rapidly, as had mortgage borrowing. And consumers who borrow via credit cards or subprime mortgages are in the historically unusual position of being in charge of deciding how much they can afford to borrow. Alternative financial services such as payday lending have also become widespread.

This report explores how well equipped today's households are to make complex financial decisions in the face of often high-cost and high-risk financial instruments. Specifically we focus on financial literacy, by which we mean the knowledge of a few but fundamental financial concepts. Most importantly, we describe the geography of financial literacy, i.e., how financial literacy is distributed across the fifty US states. We also describe the correlation of financial literacy and some important aggregate variables, such as poverty rates at the state level. Finally, we examine how much differences in financial literacy across states can be explained by demographic and economic characteristics.

The analyses are based upon data from the State-by-State Survey component of the National Financial Capability Study, administered online to over 28,000 respondents between June and October 2009. Data collection and design of the questionnaires were supported by the FINRA Investor Education Foundation.

To assess financial literacy, five questions were added to the 2009 Financial Capability Study, covering fundamental concepts of economics and finance encountered in everyday life, such as simple calculations about interest rates and inflation, the workings of risk diversification, the relationship between bond prices and interest rates, and the relationship between interest payments and maturity in mortgages.

We constructed an index of financial literacy based on the number of correct answers provided by each respondent to the five financial literacy questions. An individual answering all five of the questions correctly has a financial literacy index of 5. An individual answering none of the five questions correctly has a financial literacy index of 0.

The financial literacy index allows us to examine the geographical distribution of financial literacy across the 50 states (and the District of Columbia) in the United States. The financial literacy index values range from 2.75 in Louisiana to 3.30 in New Hampshire.

To understand better the real world consequences of financial illiteracy, we analyzed the relationships–on a state-by-state basis–between financial literacy and five measures of economic distress: poverty levels, foreclosure rates, unemployment, bankruptcy, and public assistance participation. We found a significant correlation between the financial literacy index score for a state and that state's poverty level. States with higher financial literacy scores tend to have lower poverty levels and vice versa. We did not find significant correlations between financial literacy and the other four variables that were tested.

Financial literacy varies by demographics. Specifically, the financial literacy index shows lower financial literacy levels among women, those with low education, and African-Americans and Hispanics. We found that much of the state-by-state variation in financial literacy is attributable to differences in the demographic make-up of the states. However, a handful of states stand out. South Dakota and Idaho have higher financial literacy index values than would be expected based on demographic characteristics alone. Conversely, Pennsylvania, New Jersey, New York, and Connecticut have lower financial literacy index values than would be expected based on demographic characteristics.

This report highlights two main findings. First, financial literacy is rather low in the population and most Americans are not familiar with fundamental concepts that should form a basis for financial decision-making. Given the current shift toward more individual responsibility for financial wellbeing, this is a worrisome finding. Second, there is considerable geographic variation in financial literacy that only a few studies are beginning to document. As discussed in the report, some of these differences are due to demographic and economic characteristics across states, but these variables cannot explain all of these differences.

Our findings indicate directions for policy makers and practitioners interested in targeting the areas where financial literacy is low. Moreover, the Financial Capability Study can serve as a good baseline against which to measure the effects of financial education programs at the state level. One direction of future research is to better understand the origins of the geographical differences in financial literacy.

1. Introduction

In the last few decades, financial markets around the world have become increasingly accessible to the "small investor" as new products and financial services have come on the market. Nonetheless, many of these products are complex and difficult to grasp, especially for financially unsophisticated investors. At the same time, changes in the pension landscape are encouraging increased reliance on the individual, particularly in the United States. Prior to the 1980s, many Americans relied mainly on Social Security and employer-sponsored defined benefit (DB) pension plans. Today, by contrast, Baby Boomers are increasingly turning to defined contribution (DC) plans and Individual Retirement Accounts (IRAs) to help finance their retirement years. Indeed, in 1980, about 40 percent of private-sector pension contributions went to DC plans; 20 years later, almost 90 percent of such contributions went to personal accounts (mostly 401(k) plans; Poterba, Venti, and Wise 2008). The transition to the DC retirement saving model has the advantage of permitting more worker flexibility and labor mobility than in the past, yet it also imposes on employees a greater responsibility to save, invest, and decumulate retirement wealth sensibly. Furthermore, the spread of DC plans means that workers today are directly and immediately exposed to financial market risks.

How people borrow money and manage their liabilities has also undergone major change of late. Prior to the current financial crisis, consumer credit had expanded rapidly, as had mortgage borrowing. And consumers who borrow via credit cards or subprime mortgages are in the historically unusual position of being in charge of deciding how much they can afford to borrow. Alternative financial services such as payday lending have also become widespread; despite their high interest rates, payday lenders now have more storefronts than McDonald's and Starbucks combined in the states where they are allowed to operate.[1]

This report will explore how well-equipped today's households are to make complex financial decisions in the face of often high-cost and high-risk financial instruments. Specifically we focus on financial literacy, by which we mean the knowledge of a few but fundamental financial concepts. Most importantly, we describe the geography of financial literacy, i.e., how financial literacy is distributed across the fifty US states. We also describe the correlation of financial literacy and some important aggregate variables, such as poverty rates at the state level. Finally, we examine how much differences in financial literacy across states can be explained by demographic and economic characteristics

2. Measuring Financial Literacy

Economic models of consumer financial decision-making require agents to be very knowledgeable. For example, the standard theoretical framework used to model consumption/saving decisions posits that consumers save during periods of high earnings to provide for the decline in income after retirement. Even in relatively simple formulations of the model, the consumer must do a good job of predicting future labor earnings, pensions, Social Security, interest rates, inflation rates, mortality, and health shocks—to name just a few

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[1] See Skiba and Tobacman (2008).

important components. And optimal behavior also requires, at minimum, calculations made with an understanding of compound interest and the time value of money.

To assess knowledge of fundamental concepts that are essential for financial decision-making, five questions were added to the 2009 Financial Capability Study. Descriptions of the study and the financial literacy questions are provided below.

2.1. *The National Financial Capability Study*

The National Financial Capability Study consists of three linked surveys: (1) National Survey: a nationally projectable telephone survey of 1,488 American adults; (2) State-by-State Survey: an online survey of approximately 28,000 American adults (roughly 500 per state, plus the District of Columbia); (3) Military Survey: an online survey of 800 military service members and spouses. This report is based upon data from the State-by-State survey, administered to respondents between June and October 2009. Data collection and design of the survey instruments were supported by the FINRA Investor Education Foundation.[2]

The overarching research objectives of the National Financial Capability Study were to benchmark key indicators of financial capability and evaluate how these indicators vary with underlying demographic, behavioral, attitudinal, and financial literacy characteristics. Financial capability cannot be judged simply by looking at one indicator. Rather, it covers several aspects of behavior. Consistent with the surveys that have been done in other countries, these behavioral aspects include how people manage their resources, how they make financial decisions, the skill set they use in making such decisions, and the search and information elaboration that goes into those decisions.

It is worth noting that a handful of other countries have so far collected data on financial literacy/financial capability. The United Kingdom was among the first to design a survey on financial capability, in 2005, and similar initiatives have been undertaken in New Zealand, Australia, Ireland, Canada, and the Netherlands. New Zealand is one of the few countries to have followed up with a second survey, with a 2009 survey designed to assess the changes in financial knowledge and behavior of New Zealanders over a three-year span.

The survey data provide a rich set of information on four main areas of Americans' financial capability:

1) Making ends meet
2) Planning ahead
3) Choosing and managing financial products
4) Financial knowledge and decision-making

This report focuses on one specific area: financial knowledge, i.e., the level of financial literacy across states.

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[2] More information about this survey is provided at: http://www.finrafoundation.org/resources/research/p120478. See also Lusardi (2010, 2011).

2.2. *Financial Literacy Questions*

To evaluate financial knowledge, respondents were exposed to a battery of questions covering fundamental concepts of economics and finance encountered in everyday life, such as simple calculations about interest rates and inflation, the workings of risk diversification, the relationship between bond prices and interest rates, and the relationship between interest payments and maturity in mortgages. The wording of the questions and answer choices follow:

1) *Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?*
   More than $102
   Exactly $102
   Less than $102
   Don't know
   Prefer not to say

2) *Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?*
   More than today
   Exactly the same
   Less than today
   Don't know
   Prefer not to say

3) *True or false: Buying a single company's stock usually provides a safer return than a stock mutual fund.*
   True
   False
   Don't know
   Prefer not to say

4) *If interest rates rise, what will typically happen to bond prices?*
   They will rise
   They will fall
   They will stay the same
   There is no relationship between bond prices and interest rates
   Don't know
   Prefer not to say

5) *True or false: A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.*
   True
   False
   Don't know
   Prefer not to say

The first question measures numeracy, or the capacity to do a simple calculation related to compounding of interest rates. Of course complex interest compounding is also important, but the focus instead here is on whether individuals could get the general idea of calculations relating to interest rates. The second question measures understanding of inflation, again in the context of a simple financial decision. The third question gauges knowledge of risk diversification; it is a joint test of knowledge about "stocks" and "stock mutual funds," and of risk diversification, since the answer to this question depends on knowing what a stock is and that a mutual fund is composed of many stocks. In view of the fact that employees are increasingly asked to select their pension investment portfolios, it is important to ask questions related to risk diversification.[3] The fourth question is about the relationship between the price and yield of a fixed income asset; it is the most complex question of the set and it is designed to differentiate among levels of financial knowledge. Finally, the fifth question measures the understanding of mortgages and mortgage payments, an important question given the experience on subprime mortgages and the financial crisis.

It will also be noted that, when structuring these questions, the list of possible answers has been provided to make it easier for people to simply select a preferred response. Moreover, respondents could indicate they did not know the answer or could choose to refuse to answer. This procedure prevented respondents from being forced to calculate a numeric answer, and it also enables researchers to differentiate across different levels of financial knowledge.

The first three financial literacy questions were first implemented in a special module on financial literacy in the 2004 Health and Retirement Study (HRS), a sample of over 1,200 respondents age 50+ (Lusardi and Mitchell, 2011b). They were further added to wave 11 of the National Longitudinal Survey of Youth (NLSY) for 2007-08 covering respondents age 23-28 (Lusardi, Mitchell and Curto, 2010). These questions were also added to a module in the American Life Panel in 2008, an internet-based panel data set (Lusardi and Mitchell, 2009). Subsequently these questions have been fielded in many other countries, including Germany, the Netherlands, Italy, Sweden, Russia, Japan, and New Zealand (Lusardi and Mitchell, 2011c). Moreover, these questions have been added to surveys in developing countries. Financial literacy questions similar to the ones used in the Financial Capability Study have been used in Mexico and Chile (Hastings and Tejeda-Ashton, 2008; Hastings and Mitchell, 2011, Behrman et al., 2010), and similar results have been reported in India and Indonesia (Cole, Sampson, and Zia, 2009) and among a sample of entrepreneurs in Sri Lanka (de Mel, McKenzie and Woodruff, 2008). The question about fixed income asset pricing was first tested in a module of Dutch households (van Rooij, Alessie and Lusardi, 2011a) and later added to the US American Life Panel (Lusardi and Mitchell, 2009), and it has been shown to be very effective in differentiating between financially sophisticated versus non-sophisticated respondents. Across the board, these variables do a good job of characterizing peoples' levels of financial knowledge.

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[3] When the Enron Corporation filed for bankruptcy in 2001, it turned out that a large number of now-jobless employees had also invested their entire pension assets into their company's now-worthless stock. It is therefore of interest to assess whether employees have learned from that event.

2.3. *Financial Literacy Among the Population*

The responses to the five questions are reported in Table 1 below**.** While the correct response to certain individual questions is relatively high, there are still sizeable proportions of incorrect and "don't know" answers to those questions. For example, while the numeracy question was answered correctly by 78% of respondents, one in five Americans either got the calculation wrong or did not know the answer. Similarly, one in three Americans could not provide the correct answer to the question about inflation (14% were incorrect, and 19% did not know). The bond pricing question had the smallest proportion of correct answers – only 28%. Both the bond pricing question and the risk question were difficult for respondents to answer, with nearly two out of five respondents stating they did not know the answer to each of these questions.

Table 1.

	Correct	**Incorrect**	**Don't know**
Interest rate question	78%	10%	10%
Inflation question	65%	14%	19%
Bond price question	28%	33%	37%
Mortgage question	76%	9%	15%
Risk question	53%	6%	40%

**These figures do not sum to 100 because of rounding and because of refusal to answer the questions.

When considering all of the questions together (Table 2 below), we find that slightly more than half of the population is able to correctly answer both the interest rate and inflation questions, and just under two-fifths can correctly answer these two questions plus the risk question. This is consistent with the findings documented in a variety of other studies using the same questions, both in the United States and in other countries (Lusardi and Mitchell, 2009, 2011b, 2011d; Lusardi, Mitchell and Curto, 2010). Only 15% of respondents are able to answer all of the questions correctly. These findings show not only Americans' lack of financial literacy, but also their relative ignorance about fairly basic concepts in economics and finance.
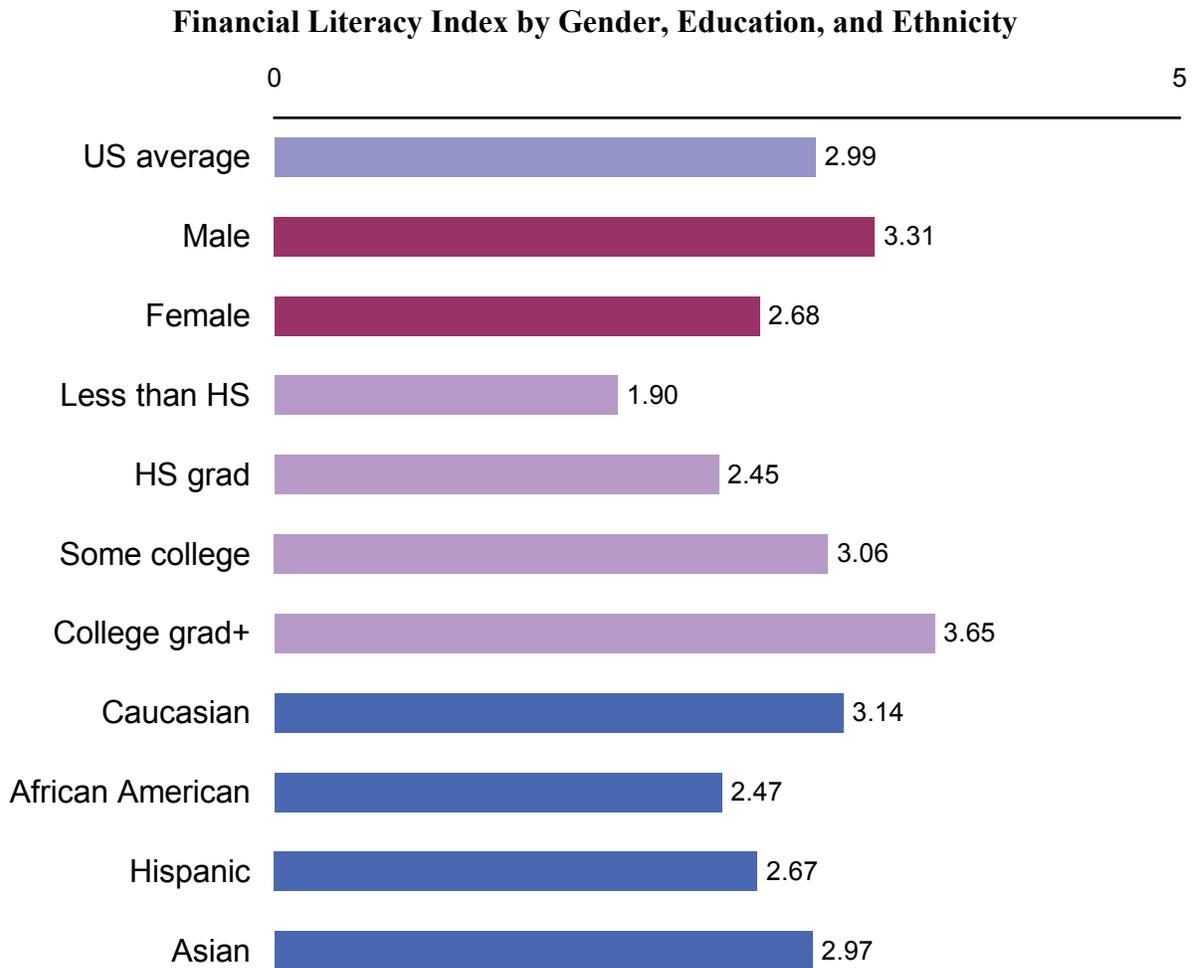
Table 2.

Interest rate and inflation questions correct	**Interest rate, inflation, and risk questions correct**	**All 5 questions correct**
57%	39%	15%

2.4. *Constructing a Financial Literacy Index*

We constructed an index of financial literacy based on the number of correct answers provided by each respondent to the five financial literacy questions. An individual answering all five of the questions correctly has a financial literacy index of 5. An individual answering none of the five questions correctly has a financial literacy index of 0. These index values allow us to calculate mean financial literacy scores for various sub-populations (e.g., demographic and geographic) and compare them to each other. The mean value of the financial literacy index across all of the respondents in the study is 2.99.

Low levels of financial literacy are widespread in the population, but the problem is particularly severe among certain demographic groups. As shown in Figure 1 below, financial literacy is low among women, those with low education, and among African Americans and Hispanics, as reported in previous work as well (Lusardi and Mitchell, 2007, 2009; 2011a; Lusardi, Mitchell, and Curto, 2010; Lusardi and Tufano, 2009a,b).

Figure 1.

Financial Literacy Index by Gender, Education, and Ethnicity

US average	2.99
Male	3.31
Female	2.68
Less than HS	1.90
HS grad	2.45
Some college	3.06
College grad+	3.65
Caucasian	3.14
African American	2.47
Hispanic	2.67
Asian	2.97

3. The Geography of Financial Literacy

The financial literacy index allows us to examine the geographical distribution of financial literacy across the 50 states (and the District of Columbia) in the United States. The mean financial literacy index values range from 2.75 in Louisiana to 3.30 in New Hampshire. Figure 2 shows the states divided into quintiles based on their mean financial literacy index values. The states with the highest levels of financial literacy (colored blue) tend to be located across the northern half of the country, while the states with lowest levels of financial literacy (colored red) are in the eastern and southern parts of the country. Table 3 shows the financial literacy index values for the five states with the highest means and the five states with the lowest means. These simple findings can be useful for policy makers and practitioners interested in targeting the areas where financial illiteracy is more prevalent.

<u>Figure 2.</u>

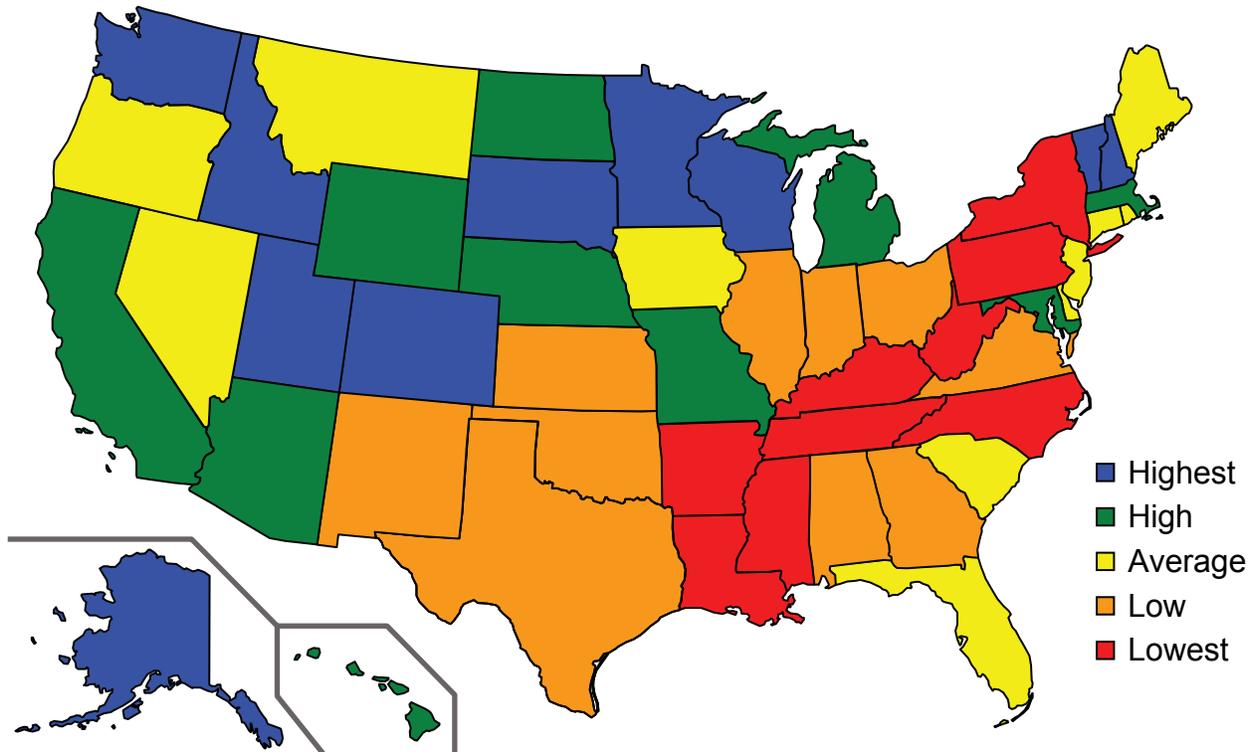**Financial Literacy Index by State**

Table 3.

| Rank	State	Financial Literacy Index Score		Rank	State	Financial Literacy Index Score
1	New Hampshire	3.30		51	Louisiana	2.75
2	Minnesota	3.28		50	West Virginia	2.83
3	South Dakota	3.27		49	Kentucky	2.84
4	Idaho	3.19		48	Arkansas	2.85
5	Vermont	3.17		47	Tennessee	2.86
	US Average	*2.99*			*US Average*	*2.99*

3.1. *Financial Literacy and Measures of Economic Distress*

To understand how financial literacy correlates with measures of economic distress at the state level, we have considered the following five measures:

1) Poverty: Percentage of the state population below poverty level (data from the US Census Bureau American Community Surveys, 2008 and 2009)

2) Foreclosures: State foreclosure rates (data from CNN/Realty Trac, April 2009)

3) Unemployment: State unemployment rates (data from CNN/US Bureau of Labor Statistics, April 2009)

4) Bankruptcy: State bankruptcy rates (data from American Bankruptcy Institute, 2009)

5) Public assistance: Percentage of state population receiving public assistance (data from US Census Bureau American Community Surveys, 2008 and 2009)

While aggregated indicators, these measures summarize how well or poorly US states are doing in economic terms. We find a strong negative correlation ($r = -0.63$, $p < .001$) between the mean financial literacy index score for a state and that state's poverty level. As illustrated in Figure 3, states with higher financial literacy scores tend to have lower poverty levels and vice versa. We did not find statistically significant correlations between financial literacy and the other four variables that were tested.

Figure 3.

Financial Literacy and Poverty Levels
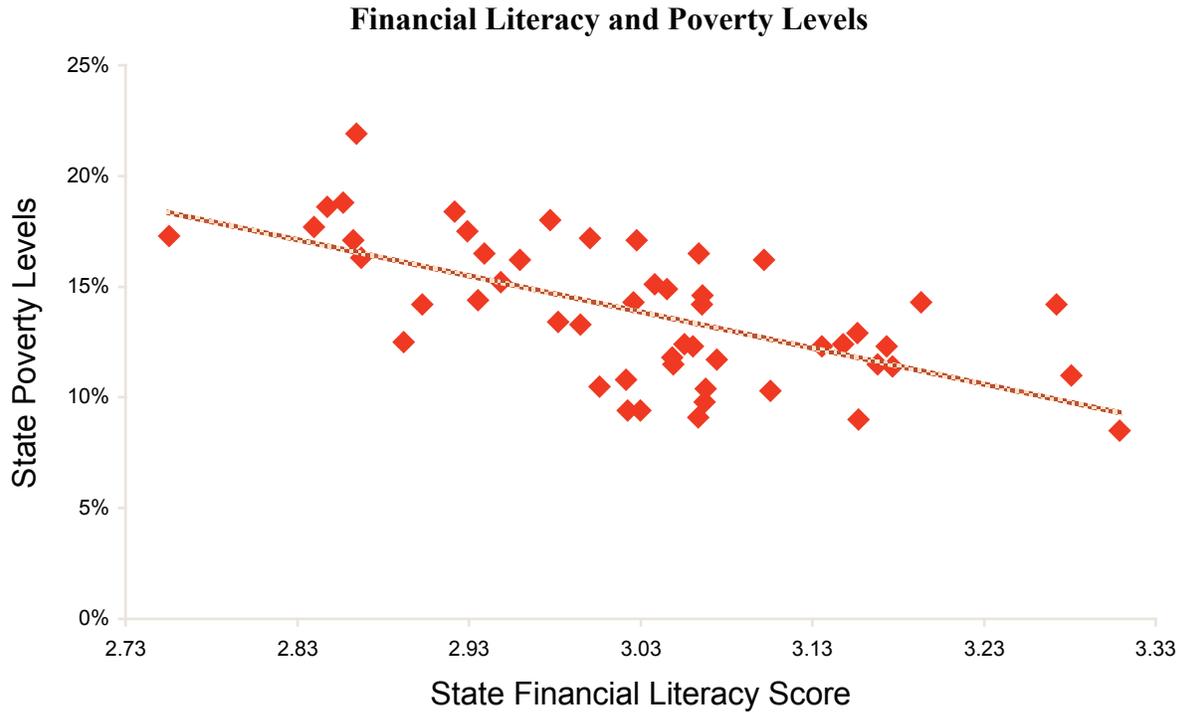
3.2. Demographic Determinants of Geographic Variations in Financial Literacy

To understand the degree to which geographical variations in financial literacy are attributable to variations in the demographic characteristics of the states, we constructed a hierarchical regression model in which demographic variables – age, gender, ethnicity, income, education, marital status – were entered in the first block, and state was entered in the second block. Dummy variables were created for gender, ethnicity, education, marital status, and state of residence; age and income were recoded into continuous variables.

As Table 4 shows, demographic variables account for a sizeable share of the variation in financial literacy among respondents (20%). The inclusion of state variables in the second block contributes very little additional predictive power (0.4%). This finding suggests that, to the degree that state-level public policies or practices have an effect on financial literacy, it is generally likely that such effects are indirect, resulting from higher or lower levels of education and/or income in that state.

Table 4.

Variables entered	$R^2\Delta$	*F*	*p*
Demographic	.203	796.87	<.001
Geographic	.004	2.92	<.001

However, in a handful of states, we find a significant effect of geography. South Dakota and Idaho have higher financial literacy index values than would be expected based on demographic characteristics (including education and income) alone. Conversely, Pennsylvania, New Jersey, New York, and Connecticut have lower financial literacy index values than would be expected based on demographic characteristics. One of the directions of future research is to understand in more detail the origin of these residual geographic differences in financial literacy.

Other studies have documented geographic differences in financial literacy. For example, Fornero and Monticone (2011) shows that financial literacy varies widely among Italian regions. While there is a distinct North-South divide in terms of financial literacy—with Southern regions showing much lower levels of financial knowledge than the Northern regions—there are also sharp differences in financial literacy among the regions in the North of Italy. Klapper and Panos (2011) also documented large differences in financial literacy in Russia. According to their work, these differences seem to be explained by living in rural versus urban areas. This is consistent with the evidence provided in other papers that, in the absence of formal education, people acquire financial literacy via interactions with others, for example peers (Duflo and Saez 2003, 2004; van Rooij, Lusardi and Alessie, 2011a), and this is more likely in areas with high population density, such as urban areas.

4. Discussion and Concluding Remarks

This report highlights two main findings. First, financial literacy is rather low in the population and most Americans are not familiar with fundamental concepts that should form a basis for financial decision-making. Given the current shift toward more individual responsibility for financial well-being, this is a worrisome finding. Second, there is considerable geographic variation in financial literacy that only a few studies are beginning to document. As discussed in the report, some of these differences are due to demographic and economic characteristics across states, but these variables cannot explain all of these differences.

Our findings provide some useful suggestions for policy makers and practitioners interested in targeting the areas where financial illiteracy is more pervasive. Moreover, the Financial Capability Study can serve as a good baseline against which to measure the effects of financial education programs at the state level. One direction of future research is to better understand the origins of the geographical differences in financial literacy.

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