FINANCIAL LITERACY AND FINANCIAL SOPHISTICATION AMONG OLDER
AMERICANS

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<u>ABSTRACT</u>

This paper analyzes new data on financial literacy and financial sophistication from the 2008 Health and Retirement Study. We show that financial literacy is lacking among older individuals and for the first time explore additional questions on financial sophistication which proves even scarcer. For this sample of older respondents over the age of 55, we find that people lack even a rudimentary understanding of stock and bond prices, risk diversification, portfolio choice, and investment fees. In view of the fact that individuals are increasingly required to take on responsibility for their own retirement security, this lack of knowledge has serious implications.

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Research Question and Relevance

Financial literacy among Americans is disappointingly low. For instance, only half of older respondents surveyed in a special module of the 2004 Health and Retirement Study (HRS) could correctly answer two simple questions regarding inflation and compound interest. Only one-third correctly answered these two questions as well as a third question about risk diversification (Lusardi and Mitchell, 2006, 2008a). Evidence of low numeracy and low financial sophistication is also evident for younger respondents (Lusardi and Mitchell, 2007a; Lusardi, Mitchell and Curto, 2009) in surveys including the Rand American Life Panel (ALP) and the Survey of Consumers (Lusardi and Mitchell, 2007c; Hilgert, Hogarth, and Beverly, 2003). Financial illiteracy is also particularly acute among specific demographic sub-groups, such as women, minorities, and those with low income and education (Lusardi and Mitchell, 2007b, 2008a). Lack of financial literacy has important consequences; those who lack literacy are much less likely to plan for retirement (Lusardi and Mitchell, 2006, 2007a, 2007c), are more likely to end up with less wealth close to retirement (Lusardi and Mitchell, 2007a), are less likely to invest in stocks (van Rooij, Lusardi and Alessie, 2007; Kimball and Shumway, 2006; Yoong , 2007), and are more likely to use high-cost means of borrowing (Lusardi and Tufano, 2009).

This paper analyzes new data from the 2008 HRS on financial literacy and financial sophistication.[1] We assess levels of financial sophistication among older individuals, specifically

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[1] This module was designed by Miles Kimball and Tyler Shumway in collaboration with the authors of this paper.

persons over the age of 55 in 2008. Many prior studies focused on simple measures of basic financial literacy and did not consider financial sophistication. Our research is informative for policy in several ways. First, results from this research can be used to design financial education programs that are more effective in fostering financial literacy and saving. By examining knowledge about the behavior of the stock market, basic asset pricing, and the importance of mutual fund fees on long-term investments, explicit suggestions can be provided regarding topics that should be covered in financial education programs. Second, this paper identifies which population groups are most likely to be financially unsophisticated. Third, the analysis indicates which groups are most prone to poor financial decision-making at older ages and provides some suggestions for improving the effectiveness of financial education programs.

Prior Research

Older Americans are not particularly financially literate, as shown by Lusardi and Mitchell (2006) using data from a special-purpose module the authors created for the 2004 HRS. These findings have been confirmed among Early Baby Boomers, who displayed not only low numeracy, but also a lack of knowledge of fundamental economic concepts such as interest rate compounding (Lusardi and Mitchell, 2007a). Moreover, particular sub-groups of the population suffer even greater deficits in financial literacy; Lusardi and Mitchell (2008a) find that women display much lower literacy than men and are much less likely to plan for retirement. Furthermore, minorities and those with low education and low income are more likely to display low levels of financial knowledge (Lusardi and Mitchell, 2007b; Lusardi, 2008b; Smith and Stewart, 2008).

These results are troublesome given the increasing complexity of financial instruments and the many transactions households must undertake that require sound economic understanding. For instance, Moore (2003) found that mortgage borrowers in Washington State knew little about compound interest and were confused about the terms of their mortgages. Campbell (2006) found that many households failed to refinance their mortgages over the 2001–2003 period, when interest rates were falling.

Furthermore, financial illiteracy can have significant long-term financial consequences (Lusardi, 2008a). For example, those who underestimate the power of interest compounding are more likely to end up with excessive amounts of debt (Lusardi and Tufano, 2009). Those who fail to refinance or to correctly estimate the amount by which interest rates could change will pay significantly more in mortgage interest (Campbell, 2006).

Data and Methodology

Most of the financial literacy studies mentioned above have drawn on evidence gathered in a short experimental module in the 2004 HRS designed by Lusardi and Mitchell.[2] This set of questions has been used very successfully to explore the links between financial literacy and retirement planning as well as retirement wealth accumulation. Nevertheless, that module included only three questions designed to assess basic numeracy and knowledge of basic economic concepts such as inflation and risk diversification. For this reason, we have sought to expand the scope of investigation into financial knowledge among the older population with additional questions added to other surveys. For instance we have developed questions on financial knowledge in the American Life Panel which we first piloted on the Dutch DNB

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[2] These questions have now been added to related surveys in Germany, Italy, the Netherlands, Russia, New Zealand, Japan, Chile, and Mexico, revealing similar patterns of widespread illiteracy.

Household Survey (Lusardi and Mitchell, 2007c; van Rooij, Lusardi and Alessie, 2007). These new measures cover not only basic but also sophisticated financial knowledge, eliciting knowledge on the difference between bonds and stocks, the working of the stock market, and basic asset pricing. In turn, this expanded set of data about financial knowledge then influenced the wording of the new module for the 2008 HRS, to be described in more detail below. Using this extended information, we can now classify respondents not only in terms of basic financial literacy but also in terms of financial sophistication.

An interesting aspect of the 2008 HRS module on financial literacy is its innovative approach to assessing how the literacy questions are designed. Not only is there a richer list of questions compared to the 2004 HRS, but also respondents are presented with alternative question wording to assess whether respondents are guessing or whether they actually understand the questions. Specifically, respondents are randomly chosen to be presented with the same questions but with reverse wording. For example, one set of respondents is asked whether the following statement is true or false: "*If you invest for the long run, the annual fees of mutual funds are important*;" the second group is asked: "*If you invest for the long run, the annual fees of mutual funds are unimportant*." Such wording reversal permits us to begin to evaluate the extent of measurement error in responses to financial sophistication questions. This is a very important methodological innovation. Both the Dutch DNB Household Survey and the ALP used a similar approach for a small subset of the questions, and there we showed that the wording of the questions does matter, particularly for questions measuring financial sophistication (Lusardi and Mitchell, 2007c, 2009; van Rooij, Lusardi and Alessie, 2007). In general, if people are financially unsophisticated, it will be difficult to elicit accurate responses to unfamiliar concepts.

Measuring Financial Sophistication

In 2008, a subset of some 1332 HRS respondents responded to a battery of questions seeking to assess their knowledge of the stock market, asset pricing, investment strategies, risk diversification, the importance of fees, financial attitudes and related topics. Because so many questions are asked to respondents, we have organized them into five different sub-groups according to the topics they cover, as follows (exact question wording appears in the Appendix):

(A) Knowledge of capital markets

> V407 Understanding of the stock market

> V408 Investment in company stocks

> V408 Avoidance of foreign stocks

> V416 Bond value versus interest rate

(B) Risk diversification

> V411 Invest in few stocks

> V417 Stock risk spread

> V419 Diversify stocks

(C) Knowledge of fees

> V415 Importance of annual fees

> V418 Asset annual fees

(D) Savvy/numeracy

> V412 Buy/sell stocks often

> V413 Enough life insurance

V422 Use savings in bank to pay off credit cards

V423 Power of interest compounding

(E) Attitudes toward investing and risk

V406 All money in safest asset

V410 Whether older retired should hold stocks

V420 Smart people select stocks with good return

V421 Stock market equals lottery

V424 Advisors take unfair advantage

Respondents to this module were, on average, age 67, with about 55% female. About 16% had less than high school education, 33% had high school, 24% had some college, and 28% had college or advanced degrees. The majority, 81%, of the respondents was White, 9% African-American, and 8% Hispanic. Summary statistics on outcomes appear in Tables 1-5, and detail by sex, age, and education in Tables 6-9.

A. *Knowledge of capital markets*

Recalling that this module was fielded in 2008, a year of particularly volatile capital markets, it is probably not surprising that a large majority of respondents reported that they did not understand this market; only about 30% said they did. Nevertheless the degree of financially illiteracy extends much more broadly, supporting the view that older Americans lack an understanding of key concepts related to stock prices, risk diversification, and portfolio choice (Table 1). For instance, many respondents expressed a preference for having some company stocks, though there is some sensitivity to the way the question was asked. Respondents given the first wording of this question (whether an employee of a company with publicly traded stock

should have a lot of his/her retirement savings in the company stock) did believe that holding a lot a company stocks is not a good idea. Yet when presented with the reverse wording, most rejected the idea of holding little or no money in company stock. Since the typical worker will have a large part of his total wealth in human capital which is highly correlated with his employer's financial stability, it is likely to be unwise from a risk diversification viewpoint to hold own employer stock.

The results also show that respondents were wary of investing in international equity. Experts have long argued that international diversification helps diversify risk and offers exposure to fast-growing foreign economies. Nevertheless, many prior studies have found evidence of "home bias," and this is also evident among older respondents (French and Poterba, 1991). It is interesting that the wording of the question matters: respondents were more likely to display financial sophistication when they were asked if *it is best to avoid stocks* of foreign companies, rather than if *it is a good idea to own stocks* of foreign companies.

Table 1 also shows that a large majority of respondents did not know about asset pricing, which we have tested by asking whether people know about the inverse relationship between bond prices and interest rates. This is a particularly good question to assess financial sophistication because, while some questions may be answered correctly if people are good at math or are clever and can figure out an answer, it is hard if not impossible to know or infer the correct answer to this question without having some knowledge of finance. When we piloted this question in both the ALP and the Dutch DNB, we found that a small share (fewer than half) of respondents knew about bond pricing, and also the wording of this question mattered. We confirm this finding for the present module as well. When presented with the statement *if interest rates fall, bond prices will rise,* only about one-third (36%) of respondents answered correctly;

the wording was reversed and people were asked *if interest rates fall, bond prices will fall* , many more are correct. This may be due to guessing, since a sizable proportion of respondents (as many as 23%) reported they did not know the answer to this question.[3] Note too that answers to these questions are not highly correlated and only 6% could respond correctly to all four questions. Moreover, more than a fourth answered "do not know" to at least one of the questions.

B. Knowledge of risk diversification

Knowledge of risk diversification is very important when contemplating investment options. Table 2 shows that many respondents (over 60%) seemed to know that it is not a good idea to invest in a few stocks rather than in many stocks or in mutual funds, which may imply some sophistication about risk. Moreover, the large majority seemed to know that spreading money across 20 stocks rather than two decreases the risk of losing money. Yet again the way both questions are worded matters, indicating that some respondents were simply guessing. We hypothesize that some of the sensitivity to how the questions are asked could be due to economic terminology. For instance, many respondents may not know what a mutual fund is or the fact that mutual funds contain many stocks. Finally, close to half of the respondents agreed that by diversifying, one could invest more in stocks; now there is little sensitivity to question wording, perhaps because this question does not require much knowledge beyond what a stock is.

While each individual question seems to indicate some knowledge and understanding of risk diversification, only one-third (32%) of respondents answered correctly to all three questions and 23% responded "do not know" to at least one question, showing that their knowledge was limited to one specific concept.

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[3]   In prior research we have found that those who respond that they "do not know" are also those who are least financially knowledgeable (Lusardi and Mitchell, 2006).

C. Knowledge of fees

Two questions in the module seek to assess peoples' knowledge of fees associated with investments; see Table 3. This is important since higher fees erode retirement wealth, yet prior studies have shown that investors often overlook fees when deciding how to invest (Choi, Laibson and Madrian, 2009; Mitchell, Todd and Bravo, 2008). In our sample, a sizable percentage (60%) seemed to know that mutual fund fees are important when investing for the long run, but the responses are sensitive to the wording of the questions, perhaps due to the fact that the respondent would have to know both about mutual funds and what investing for the long run means. Note also that a large majority of respondents found it difficult to locate mutual funds with annual fees of less than one percent of assets, suggesting that many respondents may not know about indexed funds. Moreover, only about one-quarter (28%) of respondents evinced some financial sophistication with respect to fees by answering both questions correctly, while more than 30% responded "do not know" to at least one of these two questions.

D. Savvy/numeracy

While it is important to evaluate whether people know about fees, it is also important to know whether they pursue behaviors that could reduce fees. Table 4 shows what respondents knew regarding the question of whether "*to make money in the market they should not buy and sell stocks too often*." Most respondents (over 60%) seemed to be savvy with regard to buying and selling stocks. Similarly, many respondents (almost 70%) were savvy about life insurance and, for example, knew that replacing three years of income would be inadequate coverage for a family with a working husband and a wife who stays home to take care of young children. Most

respondents also knew that using money in a bank account to pay off credit card debt is usually a good idea.

Probably due to their simplicity, those questions elicit responses that are insensitive to question wording. This is, however, not the case for a different query asked to assess whether people know about the power of interest compounding and their ability to do rather complex calculations involving interest rates. Over half seemed to be able to figure out that an initial investment of $1,000 would grow more than six-fold when invested at an interest rate of 10% for 30 years. Nevertheless the alternative wording generates different answers, so at least some were guessing. Moreover, only one quarter (22%) were able to give correct answers to all four questions, and another quarter (22%) responded with "do not know" to at least one of these questions.

E. Attitudes toward investing and risk

Other questions in the module measure financial attitudes; see Table 5. One focuses on older persons' willingness to accept investment risk. It is interesting that a large majority of the older respondents (68%) did not agree that "*one should put all money into the safest investment and accept whatever return it pays,*" a notable finding given the timing of the survey. And most respondents thought that even older retired households should hold some stocks, a finding very much in line with the willingness to accept some risk displayed in the responses to the first question. Many respondents were also aware that "*even if one is smart, it is very difficult to pick individual stocks that will have better than average returns.*" In the latter case, however, responses were vastly different depending on how the question was asked. Most respondents also

knew that investing in the stock market is better than buying lottery tickets, and that it is incorrect to think that one has to be taken advantage of when investing in the stock market.

While responses to these questions do seem to pick up some sophistication among respondents, the fact that the question wording matters so much casts some doubt on whether respondents were informed or simply guessing. Furthermore, since only one fifth of respondents could answer all questions correctly and one fifth responded "do not know" to at least one question, the evidence is indicative of widespread shortcomings in financial sophistication.

Who Knows the Least?

As shown above, there is some evidence of financial sophistication when assessing the answers to a large set of questions, but sophistication seems limited to a specific concept and the fraction of respondents that can be considered sophisticated, at least judging from their responses to this set of questions, is hardly above 25%. Next we explore how responses to these questions vary by sex, education, age, and race/ethnicity.

Table 6 shows that older women were substantially less likely than older men to report they understood the stock market reasonably well. And while they did not differ much in how they would invest in company stock, women were more likely to avoid investing in foreign stocks. Moreover, they were less likely to be knowledgeable about asset pricing, i.e., the relationship between bond prices and interest rates. They were also less knowledgeable than men about risk diversification; for example, they were less likely to know that spreading money across many stocks decreases the risk of losing money. This raises the question of whether some of the attitudes toward risk that women display are due to preferences or to financial sophistication.

In terms of knowledge about fees, women were similar to men and sometimes they seemed to know more. Further, their financial savvy was similar to men's and in some cases, they were more knowledgeable about adequate life insurance and how to be savvy about credit cards. Nevertheless, women performed substantially less well in terms of numeracy and complex calculations than men, confirming our findings from other surveys (Mitchell and Lusardi, 2006, 2008, 2009). We also note that the attitudes of women were not very different from those of men, and while women tended to score a little lower than men in these questions, differences were often not statistically significant.

Overall, there was a gender gap in terms of financial sophistication between women and men. Women were less knowledgeable about some of the complex concepts of finance and investing, such as the working of the stock market, risk diversification, and asset pricing. They also had more difficulty in doing complex calculations. Because women were more likely to respond that they do not know the answers to the questions, they are more likely to be classified among those with low knowledge. Of course, awareness of lack of knowledge could help women acquire knowledge or become more active in seeking for help and counseling (Lusardi, Keller and Keller, 2008).

Table 7 reports how financial sophistication varies by educational level. Overall, the proportion of sophisticated respondents increases monotonically as we move to higher educational attainment and it is highest for those with at least a college degree. Some of the differences are quite staggering. For example, only 14% of those with less than a high school degree stated that they know how the stock market works reasonably well. For those with at least a college degree the percentages are far higher, though even here, fewer than half agreed with this assessment. These are worrisome statistics, in view of the shift in responsibility from

employers to workers for saving and investing retirement wealth. Similarly, only one third (31%) of respondents with less than a high school degree thought it was a good idea to invest in foreign stocks; the share increases steadily across higher levels of education and more than doubles (66%) among those with a college degree. This suggests that financial sophistication can be an important determinant not only of stock market participation but also of the types of portfolios that investors hold. Similarly, we find that the knowledge of asset pricing was very low among those with less than a high school degree (23.5%), while it increased to more than 50% for the college educated.

Across all questions measuring risk diversification, there is a steep education gradient, so the financially sophisticated tend be the most educated. This is true even for questions that do not use economic terminology (e.g. do not require knowing what a mutual fund is and how it operates). For example, the least educated were much less likely to know that holding 20 rather than two stocks decreases the risk of losing a lot of money.

With respect to fees, less educated respondents were unlikely to be aware of the importance of fees, but there are no significant differences across educational grouping as to the difficulty of finding low-cost mutual funds. We take this to imply that knowledge of indexed funds is not widespread even among the educated, and/or that search and time costs are high for most groups. Financial savvy was lower among those with less education; those respondents were less skillful in doing complex calculations and in credit card debt management, a finding consistent with other surveys (Lusardi and Tufano, 2009). It probably means that those with the least knowledge will pay higher interest rates on their debt. It may be that the tendency to invest in the safest investment is a proxy for having little knowledge, rather than risk aversion.

Responses to the financial sophistication questions also differed across age groups; see Table 7. Few over age 75 understood the working of the stock market or were willing to buy foreign stock, perhaps reflecting the fact of limited exposure to stock markets. Knowledge about risk diversification declined steadily with age: older respondents were much less likely to know how to decrease risk when investing in stocks, even when questions were phrased simply. Many respondents stated that fees were important, but older respondents found it more difficult to locate low-fee mutual funds. This might be due to their lesser facility with the internet or reduced cognitive ability. People age 75+ seemed less savvy as well; they were less likely to know that one loses money by trading stocks often or how to manage credit card debt, and they were less likely to be correct in complex calculations about interest compounding. Older investors were also more wary of being taken advantage of in the stock market, consistent with their lower levels of financial sophistication.

In Table 9 we summarize differences across race/ethnicity. Knowledge about the stock market low was particularly low among African-Americans and Hispanics, where only 21% and 15%, respectively, reported that they understood the stock market reasonably well. This lesser knowledge was also apparent in responses to questions about company stock, foreign stocks, and asset pricing. Sharp differences in knowledge also emerged regarding risk diversification. Even when questions did not refer to concepts such as mutual funds, the percentage of respondents knowing about risk diversification was much lower among African-Americans and Hispanics. Nonwhites were also less likely to know about adequate life insurance, that stock market trading is costly, and that is a good idea to pay off credit cards with bank saving. They were also less likely to be correct in calculations involving interest compounding. Some of the answers to these questions may simply pick up the limited experience that respondents have with stocks and

bonds, and also with credit cards. Note also that the attitudes of African-Americans and Hispanics differed markedly from those of White respondents. For example, Hispanics were substantially more likely to think they should put all of their money in the safest investment they can find and accept whatever return it pays. Moreover, they were more likely to think that *"investing in the stock market is no better than buying lottery tickets,"* and that *"there is no way to avoid people taking advantage of you if you invest in the stock market."* These findings are supportive of prior surveys on differences in financial literacy by race/ethnicity (Lusardi and Mitchell, 2006, 2007a, 2007b, 2009).

Implications

In this paper, and in much of our earlier work, we have found substantial shortfalls in older persons' levels of financial literacy and financial sophistication. The value-added of the present research is to illuminate key areas where more could be done to inform, educate, and deepen peoples' understanding of what must be done to diversify investments, reduce costs, and make retirement saving more effective. We have used an extensive module fielded in the 2008 HRS to explore knowledge about capital markets and risk diversification, knowledge of fees, financial savvy/numeracy, and attitudes toward investing and risk. We also exploit differences in question wording to gain insight into whether respondents are guessing or actually know the answers to the questions posed.

For this sample of older respondents over the age of 55, we find that people lack even a rudimentary understanding of stock and bond prices, risk diversification, portfolio choice, and investment fees. Furthermore, people that got one question correct were not particularly likely to get others correct, and "do not know" responses were quite widespread. Simpler questions that

avoided economic jargon were easier to answer. We also conclude that the way in which the questions were framed mattered: for instance, 38% answered correctly when asked to opine on the following statement:*"it is easy to pick individual company stock that will have better than average returns"* whereas 74% answered correctly when the reverse wording was offered "*it is hard to pick individual company stock that will have better than average returns*." This suggests that more research is needed on the way in which financial sophistication questions are framed, to evaluate whether and how to help people develop a fuller understanding of how retirement saving and investment work.

This analysis may be of use to those working to enhance retirement security. It is clear that employees and retirees are increasingly being asked to take on tasks requiring financial sophistication, including making saving, investment, and dissaving decisions for retirement. Our research suggests that it may be particularly important to build human capital via retirement, educational programs, and retirement planning products. Nevertheless, one-size-fits-all programs are unlikely to successfully address saving shortfalls particularly among the elderly, given the very different patterns we have discerned by sex, age, educational levels, and race/ethnicity. Our research suggests that programs targeted to address fundamental differences in preferences, saving needs, and financial knowledge as well as sophistication, could be more effective.

Appendix

The specific questions we used in this analysis, along with their question numbers as reported in the Special Purpose Module for HRS 2008, are listed as below. Additional information on the module is available at

V406_ALL MONEY SAFEST
Please indicate whether you think each statement is true or false.
If you are not sure, give your best guess.
You should put all your money into the safest investment you
can find and accept whatever return it pays.
/"All money in safest investment"

V407_UNDERSTAND STOCK MARKET
(Please indicate whether you think each statement is true or false.
If you are not sure, give your best guess.)
I understand the stock market reasonably well.
/"Understand stock market well"

V408_INVESTCOMPANY STOCK
An employee of a company with publicly traded stock should
have [a lot/little or none] of his or her retirement savings in the
company's stock.
/"Should employee invest in company stock"

V409_AVOID FOREIGNS TOCKS
It is [best to avoid owning/a good idea to own] stocks
of foreign companies.
/"Should own foreign stocks"

V410_RETIRED HOLD STOCKS
[Even older/Older] retired people should [hold some/not hold
any] stocks.
/"Should older people hold stocks"

V411_INVEST FEW STOCKS
(Please indicate whether you think each statement is
true or false. If you are not sure, give your best guess.)
You should invest [most of your money in a few good
stocks that you select rather than in lots of stocks or in
mutual funds/
in either mutual funds or a large number of different
stocks instead of just a few stocks].
/"Invest in few vs many stocks"

V412_BUY SELL STOCK SOFTEN
To make money in the stock market, you [should not/have to]
buy and sell stocks [too/] often.
/"Buy and sell often"

V413_ENOUGH LIFE INSURANCE
For a family with a working husband and a wife staying
home to take care of their young children, life
insurance that will replace three years of income is
[not/more than] enough life insurance.
/"How much life insurance"

V414_SELLS TOCKS VALUE UP DOWN
If you have to sell one of your stocks, you should sell
one which has gone [up/down] in price rather than one
which has gone [down/up].
/"Sell when stocks up or down"

V415_IMPORTANCE ANNUAL FEES
If you invest for the long run, the annual fees of mutual
funds are [unimportant/important].
/"Importance of annual fees"

V416_BOND VALUE VS INTEREST RATE
(Please indicate whether you think each statement is
true or false. If you are not sure, give your best guess.)
If the interest rate falls, bond prices will [rise/fall].
/"Bond value vs interest rate change"

V417_STOCK RISK SPREAD
When an investor spreads money between 20 stocks,
rather than 2, the risk of losing a lot of money
[decreases/increases].
/"Risk vs number of stocks"

V418_ASSETS ANNUAL FEES
It is [hard/easy] to find mutual funds that have annual
fees of less than one percent of assets.
/"Low annual fees hard or easy to find"

V419_DIVERSIFY STOCKS
The more you diversify among stocks, the [more/less]
of your money you [can/should] invest in stocks.
/"Amount invest vs stock diversification"

V420_SELECT FOR GOOD RETURN
(Please indicate whether you think each statement is
true or false. If you are not sure, give your best guess.)
[If/Even if] you are smart, it is [easy/hard] to pick
individual company stocks that will have better than
average returns.
/"Pick stocks with good returns"

V421_INVESTMENT EQUALS LOTTERY
Financially, investing in the stock market is [no
better/better] than buying lottery tickets.
/"Stock market like lottery"

V422_USE SAVINGS PAY OFF CC DEBT
Using money in a bank savings account to pay off
credit card debt is usually a [good/bad] idea.
/"Use savings pay off credit card debt"

V423_GROWTH OF INVESTMENT
If you start out with $1,000 and earn an average return
of 10% per year for 30 years, after compounding, the
initial $1,000 will have grown to [more/less] than
$6,000.
/"Growth of investment"

V424_ADVISOR UNFAIR ADVANTAGE
[There is no way to avoid people taking advantage of
you if you invest in the stock market./
It's possible to invest in the stock market in a way that makes it
hard for people to take unfair advantage of you.]
/"Do advisors take unfair advantage"

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Table 1: Knowledge of Capital Markets

	Sophisticated	Unsophisticated	DK	RF	N
LV407	29.9	69.4	0.6	0.2	1332
LV408a	72.1	21.1	6.7	0.2	647
LV408b	33.4	56.2	9.5	0.9	685
LV408p	52.0	39.3	8.1	0.6	1332

Pearson chi2(3) = 155.2645   Pr = 0.000

	Sophisticated	Unsophisticated	DK	RF	N
LV409a	57.0	36.3	6.2	0.4	647
LV409b	45.1	46.7	7.7	0.5	685
LV409p	50.9	41.7	7.0	0.4	1332

Pearson chi2(3) = 36.1794   Pr = 0.000

	Sophisticated	Unsophisticated	DK	RF	N
LV416a	44.5	31.8	23.0	0.7	647
LV416b	35.8	43.8	19.6	0.8	685
LV416p	40.0	38.0	21.2	0.8	1332

Pearson chi2(3) = 21.5366   Pr = 0.000

Note: "a" denotes responses to the first wording of the question, "b" denotes responses to the second wording of the question, and "p" denotes pooled responses across question wordings. DK = don't know; RF = refuse. N = number of observations. For specific question order and variable names see the Appendix.

Number of Sophisticated Responses

0	1	2	3	4
16.9	25.4	31.6	20.3	5.8

At Least One DK Response

25.4

Table 2: Risk Diversification

	Sophisticated	Unsophisticated	DK	RF	N
LV411a	60.3	31.7	7.7	0.3	647
LV411b	69.0	21.8	8.5	0.7	685
LV411p	64.8	26.6	8.1	0.5	1332

Pearson chi2(3) = 17.9071   Pr = 0.000

	Sophisticated	Unsophisticated	DK	RF	N
LV417a	61.5	25.4	12.4	0.7	647
LV417b	60.5	28.3	10.1	1.1	685
LV417p	61.0	26.9	11.2	0.9	1332

Pearson chi2(3) = 2.6492   Pr = 0.449

	Sophisticated	Unsophisticated	DK	RF	N
LV419a	45.5	33.1	20.6	0.9	647
LV419b	54.6	25.2	19.1	1.1	685
LV419p	50.2	29.0	19.8	1.0	1332

Pearson chi2(3) = 2.0591   Pr = 0.560

Note: See Table 1.

Number of Sophisticated Responses			
0	1	2	3
15.5	24.6	28.3	31.6

At Least One DK Response
23.1

Table 3: Knowledge of Fees

	Sophisticated	Unsophisticated	DK	RF	N
LV415a	60.2	27.0	12.4	0.4	647
LV415b	71.3	14.9	12.5	1.2	685
LV415p	66.0	20.7	12.5	0.8	1332

Pearson chi2(3) = 39.5088   Pr = 0.000

	Sophisticated	Unsophisticated	DK	RF	N
LV418a	42.8	30.0	26.4	0.9	647
LV418b	36.2	32.3	30.4	1.1	685
LV418p	39.4	31.2	28.5	1.0	1332

Pearson chi2(3) =   6.9810   Pr = 0.073

Note: See Table 1.

Number of Sophisticated Responses		
0	1	2
22.3	50.1	27.6

At Least One DK Response
30.6

Table 4: Savvy and Numeracy

	Sophisticated	Unsophisticated	DK	RF	N
LV412a	62.5	29.9	7.3	0.3	647
LV412b	63.2	28.4	7.5	0.9	685
LV412p	62.8	29.1	7.4	0.6	1332
Pearson chi2(3) = 1.6367 Pr = 0.651					
LV413a	70.3	23.6	5.8	0.4	647
LV413b	69.2	22.0	8.0	0.8	685
LV413p	69.7	22.7	6.9	0.6	1332
Pearson chi2(3) = 2.9379 Pr = 0.401					
LV422a	60.0	33.7	5.6	0.7	647
LV422b	56.8	38.9	3.5	0.9	685
LV422p	58.3	36.4	4.5	0.8	1332
Pearson chi2(3) = 3.4811 Pr = 0.323					
LV423a	69.7	14.4	14.3	1.5	647
LV423b	53.7	27.3	17.4	1.6	685
LV423p	61.4	21.1	15.9	1.6	1332
Pearson chi2(3) = 42.7449 Pr = 0.000					

Note: See Table 1.

Number of Sophisticated Responses				
0	1	2	3	4
6.7	11.6	26.9	32.4	22.4

At Least One DK Response
21.7

Table 5: Attitudes Toward Investing and Risk

	Sophisticated	Unsophisticated	DK	RF	N
LV406	68.2	28.8	2.5	0.5	1332
LV410a	65.1	30.1	4.5	0.3	647
LV410b	83.9	10.9	4.8	0.5	685
LV410p	74.8	20.2	4.6	0.4	1332
Pearson chi2(3) = 91.2578 Pr = 0.000					
LV420a	37.6	48.0	13.5	0.8	647
LV420b	73.6	16.4	9.0	1.0	685
LV420p	56.2	31.7	11.2	0.9	1332
Pearson chi2(3) = 205.0627 Pr = 0.000					
LV421a	65.0	28.6	5.2	1.2	647
LV421b	85.2	10.0	4.1	0.7	685
LV421p	75.4	19.0	4.6	1.0	1332
Pearson chi2(3) = 86.3645 Pr = 0.000					
LV424a	66.5	24.4	8.1	1.1	647
LV424b	49.9	32.8	15.7	1.6	685
LV424p	57.9	28.7	12.0	1.3	1332
Pearson chi2(3) = 36.9570 Pr = 0.000					

Note: See Table 1.

Number of Sophisticated Responses					
0	1	2	3	4	5
3.0	7.4	13.6	25.7	30.6	19.7

At Least One DK Response
19.9

Table 6: Financial Sophistication by Sex

	Male (N=577)			Female (N=755)		
	Soph	Unsph	DK	Soph	Unsph	DK
LV406	67.6	30.0	1.6	68.7	27.9	3.2
LV407	39.0	60.7	0.1	22.5	76.5	0.9
LV408p	50.6	44.9	4.1	53.2	34.7	11.4
LV409p	55.7	39.5	4.2	46.9	43.5	9.3
LV410p	78.9	18.5	2.2	71.5	21.5	6.6
LV411p	68.0	27.0	4.6	62.2	26.2	10.9
LV412p	67.5	28.6	3.3	59.1	29.6	10.8
LV413p	69.1	26.7	3.3	70.2	19.5	9.9
LV415p	70.5	21.7	6.6	62.3	20.0	17.3
LV416p	46.5	38.5	14.0	34.7	37.6	27.1
LV417p	65.9	26.0	6.9	56.9	27.7	14.8
LV418p	37.9	39.2	21.6	40.6	24.6	34.1
LV419p	55.9	30.4	12.5	45.5	27.9	25.8
LV420p	57.3	34.6	6.9	55.4	29.3	14.7
LV421p	77.9	19.0	2.1	73.4	18.9	6.7
LV422p	59.8	36.1	3.2	57.1	36.6	5.6
LV423p	69.8	19.8	8.9	54.6	22.1	21.7
LV424p	59.3	32.3	6.6	56.8	25.8	16.5

T-tests for Differences in Means between Males and Females (p-value)

	Soph	Unsph	DK
LV406	0.203	0.029	0.004
LV407	0.000	0.000	0.018
LV408p	0.459	0.000	0.000
LV409p	0.002	0.266	0.000
LV410p	0.010	0.525	0.000
LV411p	0.016	0.325	0.000
LV412p	0.003	0.944	0.000
LV413p	0.865	0.008	0.000
LV415p	0.015	0.194	0.000
LV416p	0.001	0.124	0.000
LV417p	0.000	0.523	0.000
LV418p	0.376	0.000	0.000
LV419p	0.000	0.523	0.000
LV420p	0.140	0.098	0.000
LV421p	0.037	0.892	0.000
LV422p	0.089	0.855	0.001
LV423p	0.000	0.967	0.000
LV424p	0.021	0.194	0.000

Note: See Table 1.

Table 7: Financial Sophistication by Education

	Less Than High School (N=273)			High School Graduate (N=455)			Some College (N=292)			College Graduate Plus (N=312)		
	Soph	Unsph	DK	Soph	Unsph	DK	Soph	Unsph	DK	Soph	Unsph	DK
LV406	56.1	35.7	5.6	63.5	34.3	2.2	68.9	29.4	1.5	79.8	18.2	1.9
LV407	14.0	83.9	1.4	17.8	81.8	0.5	34.0	65.8	0.0	49.3	50.1	0.7
LV408p	45.3	37.8	15.6	53.6	38.2	7.9	50.2	41.9	7.6	55.4	39.1	4.7
LV409p	31.4	53.3	14.1	43.0	49.0	7.8	56.2	39.5	3.9	66.2	28.7	4.8
LV410p	59.4	30.6	9.4	71.7	22.3	5.8	77.7	20.2	1.5	84.5	11.9	3.2
LV411p	42.4	41.9	14.7	61.3	27.7	10.4	69.5	25.1	5.1	77.4	18.0	4.2
LV412p	42.2	41.8	14.6	56.8	33.4	9.2	67.9	25.5	6.3	76.9	20.4	2.3
LV413p	61.4	24.6	12.2	70.2	21.9	7.5	71.9	23.3	4.6	72.0	22.3	5.4
LV415p	57.5	18.6	22.6	64.4	22.5	12.6	67.7	20.8	10.8	71.0	19.8	8.2
LV416p	23.5	50.8	24.5	39.6	37.1	22.4	39.2	41.1	18.9	50.2	29.4	20.0
LV417p	36.4	42.7	19.6	56.7	30.0	12.5	62.2	26.8	10.3	78.5	14.8	5.9
LV418p	41.7	28.3	28.6	39.6	29.3	30.1	39.6	31.6	27.9	37.6	34.6	27.0
LV419p	38.7	34.3	25.6	46.3	28.9	23.8	50.4	32.2	16.4	60.9	23.5	14.9
LV420p	43.4	35.8	19.5	52.2	34.6	12.3	57.2	33.5	8.4	67.2	24.5	7.7
LV421p	55.0	31.1	11.2	70.8	23.3	5.0	82.2	13.9	3.4	86.4	11.6	1.7
LV422p	41.7	46.8	10.1	56.7	37.0	5.6	59.3	37.2	2.9	68.5	29.3	1.4
LV423p	43.2	28.8	25.3	56.5	23.6	18.6	65.3	21.3	12.8	73.9	13.7	10.3
LV424p	46.8	35.0	16.7	53.5	31.2	13.6	62.4	25.7	11.2	65.3	24.9	8.5

	T-tests for Differences in Means between LTHS and High School Grad (p-value)			T-tests for Differences in Means between Some College and College Graduate Plus (p-value)		
	Soph	Unsph	DK	Soph	Unsph	DK
LV406	0.031	0.685	0.002	0.002	0.002	0.939
LV407	0.081	0.445	0.013	0.000	0.000	0.088
LV408p	0.011	0.715	0.002	0.095	0.654	0.016
LV409p	0.015	0.665	0.012	0.000	0.000	0.781
LV410p	0.000	0.005	0.020	0.006	0.009	0.756
LV411p	0.000	0.001	0.010	0.002	0.012	0.237
LV412p	0.000	0.123	0.004	0.010	0.285	0.004
LV413p	0.001	0.090	0.006	0.527	0.665	0.780
LV415p	0.005	0.864	0.000	0.632	0.226	0.031
LV416p	0.002	0.066	0.169	0.001	0.008	0.672
LV417p	0.000	0.003	0.016	0.000	0.006	0.027
LV418p	0.453	0.464	0.957	0.712	0.243	0.587
LV419p	0.005	0.059	0.219	0.012	0.097	0.358
LV420p	0.006	0.547	0.002	0.043	0.140	0.490
LV421p	0.000	0.021	0.000	0.001	0.022	0.014
LV422p	0.000	0.006	0.017	0.043	0.142	0.102
LV423p	0.001	0.066	0.053	0.004	0.039	0.078
LV424p	0.053	0.371	0.088	0.035	0.160	0.152

Note: See Table 1.

Table 8: Financial Sophistication by Age

	Ages 50-64 (N=430)			Ages 65-75 (N=518)			Ages 75+ (N=384)		
	Soph	Unsph	DK	Soph	Unsph	DK	Soph	Unsph	DK
LV406	75.0	23.2	1.8	67.6	29.2	2.4	54.3	40.4	4.3
LV407	32.7	66.8	0.5	31.8	67.5	0.6	21.5	77.3	0.6
LV408p	51.9	41.6	6.2	54.1	37.1	8.7	49.7	37.0	11.8
LV409p	55.7	38.0	6.2	50.0	42.5	7.1	41.5	48.8	8.6
LV410p	77.7	18.5	3.7	75.8	19.3	4.9	67.5	24.9	6.2
LV411p	69.9	23.4	6.5	63.6	27.1	8.7	55.3	32.7	10.7
LV412p	63.9	29.7	6.3	64.9	26.0	8.6	57.9	31.9	8.4
LV413p	72.1	21.4	6.5	69.7	23.8	5.9	64.6	24.3	9.3
LV415p	66.5	23.2	10.2	67.4	19.5	12.2	63.2	16.8	17.7
LV416p	39.9	38.3	21.7	41.5	37.8	20.3	38.4	37.7	21.5
LV417p	66.1	23.9	9.9	63.4	25.3	10.4	46.8	35.7	15.0
LV418p	39.4	32.9	27.6	43.0	28.9	27.0	34.7	30.4	32.2
LV419p	55.2	29.3	15.3	48.8	27.8	22.2	40.9	29.8	26.5
LV420p	56.8	32.8	10.3	55.8	31.9	11.5	55.4	29.0	12.7
LV421p	77.4	18.5	3.7	75.4	18.1	6.1	71.2	21.2	4.9
LV422p	62.7	34.1	3.2	54.9	39.1	5.5	53.0	38.0	6.1
LV423p	64.3	22.4	12.1	61.5	19.5	18.3	55.0	20.2	21.2
LV424p	62.3	28.2	9.1	58.0	27.8	12.8	48.2	30.9	17.6

	T-tests for Differences in Means between Ages 50-64 and Ages 65-74 (p-value)			T-tests for Differences in Means between Ages 65-75 and Ages 75+ (p-value)		
	Soph	Unsph	DK	Soph	Unsph	DK
LV406	0.004	0.005	0.965	0.000	0.001	0.204
LV407	0.433	0.365	0.755	0.003	0.004	0.774
LV408p	0.547	0.187	0.187	0.256	0.898	0.224
LV409p	0.102	0.374	0.258	0.351	0.538	0.769
LV410p	0.161	0.341	0.307	0.264	0.339	0.823
LV411p	0.015	0.095	0.261	0.425	0.488	0.990
LV412p	0.942	0.220	0.140	0.364	0.175	0.338
LV413p	0.480	0.653	0.956	0.135	0.667	0.137
LV415p	0.559	0.243	0.061	0.477	0.575	0.278
LV416p	0.318	0.794	0.273	0.193	0.952	0.357
LV417p	0.430	0.699	0.774	0.006	0.073	0.303
LV418p	0.508	0.173	0.751	0.012	0.187	0.413
LV419p	0.059	0.448	0.004	0.066	0.499	0.374
LV420p	0.213	0.460	0.578	0.662	0.406	0.754
LV421p	0.099	0.429	0.131	0.841	0.732	0.181
LV422p	0.010	0.126	0.040	0.698	0.828	0.983
LV423p	0.508	0.156	0.015	0.557	0.333	0.444
LV424p	0.145	0.623	0.016	0.062	0.729	0.132

Note: See Table 1.

Table 9: Financial Sophistication by Race/Ethnicity

	White (N=980)			African-American (N=189)			Hispanic (N=135)		
	Soph	Unsph	DK	Soph	Unsph	DK	Soph	Unsph	DK
LV406	69.8	28.0	1.9	70.8	25.4	2.3	47.2	43.4	8.2
LV407	33.0	66.6	0.4	20.8	78.6	0.6	14.6	81.8	2.4
LV408p	53.9	39.2	6.4	43.9	40.6	14.8	38.3	42.1	18.3
LV409p	53.1	40.9	5.6	47.4	42.4	9.3	35.0	45.2	18.5
LV410p	75.7	20.0	4.0	71.1	23.6	4.3	72.2	15.0	11.6
LV411p	68.9	24.4	6.3	47.5	36.9	14.6	46.1	31.9	20.8
LV412p	68.2	25.8	5.5	46.7	38.4	14.0	35.7	42.0	21.1
LV413p	72.2	21.5	5.7	66.0	24.4	9.5	51.3	31.6	16.1
LV415p	66.4	21.7	11.1	67.7	15.4	16.0	53.9	19.2	25.9
LV416p	42.3	36.1	20.9	31.0	45.6	22.5	27.4	43.7	27.5
LV417p	66.8	23.0	9.3	34.1	48.4	16.6	30.6	41.5	26.5
LV418p	39.3	31.8	28.0	43.0	28.1	27.4	35.1	25.2	38.2
LV419p	53.1	27.9	18.1	34.7	36.6	27.2	38.9	25.7	34.0
LV420p	60.0	30.0	9.2	43.6	37.3	18.0	37.3	34.5	26.8
LV421p	77.8	17.7	3.5	70.5	23.6	5.6	59.0	24.8	15.3
LV422p	61.1	34.3	3.7	48.9	47.4	3.3	39.6	45.1	14.4
LV423p	65.4	18.1	14.8	46.6	36.7	16.4	36.6	33.2	27.5
LV424p	58.9	28.7	11.1	56.2	28.8	13.9	47.0	29.4	20.6

	T-tests for Differences in Means between White and African-American Respondents (p-value)			T-tests for Differences in Means between White and Hispanic Respondents (p-value)		
	Soph	Unsph	DK	Soph	Unsph	DK
LV406	0.327	0.571	0.262	0.000	0.019	0.000
LV407	0.030	0.029	0.982	0.000	0.003	0.000
LV408p	0.029	0.480	0.009	0.004	0.948	0.000
LV409p	0.011	0.512	0.001	0.000	0.294	0.000
LV410p	0.640	0.752	0.233	0.001	0.748	0.000
LV411p	0.000	0.001	0.002	0.000	0.206	0.000
LV412p	0.000	0.007	0.000	0.000	0.000	0.000
LV413p	0.117	0.238	0.290	0.000	0.000	0.000
LV415p	0.279	0.457	0.015	0.003	0.874	0.000
LV416p	0.033	0.036	0.962	0.002	0.206	0.038
LV417p	0.000	0.000	0.115	0.000	0.004	0.000
LV418p	0.519	0.406	0.945	0.148	0.733	0.250
LV419p	0.002	0.182	0.028	0.022	0.894	0.003
LV420p	0.000	0.096	0.003	0.000	0.716	0.000
LV421p	0.000	0.001	0.001	0.000	0.123	0.000
LV422p	0.010	0.024	0.262	0.000	0.020	0.000
LV423p	0.001	0.000	0.472	0.000	0.000	0.001
LV424p	0.024	0.093	0.253	0.003	0.749	0.000

Note: See Table 1.