

Assessing Financial Security of Low Income Households in the United States

Jae Min Lee, PhD Candidate, Human Sciences Department, Ohio State University
Kyoung Tae Kim, PhD Candidate, Human Sciences Department, Ohio State
University

Abstract

We examine financial vulnerability of low income households based on the poverty threshold using three measurements: the liquidity ratio, the debt-to-income ratio (DTI), and the solvency ratio. The Survey of Consumer Finances datasets from 2010 are used. Our analytic sample is included with income no greater than 3 times the poverty threshold based on the U.S. Census Bureau's 2010 report, which computes the threshold by family size, number of dependent children under 18 years, and whether the householder is over 65. 44.7% of our total sample are found as the poor and are classified in the four poverty categories: less than or equal to 100%, 101 to 150%, 151% to 200%, and 210% to 300%. The means test shows an increasing tendency to meet the ratio threshold as poverty levels decrease in the DIT and the solvency ratio, but we do not find a certain tendency in the liquidity ratio. In the multivariate analysis, differences in the likelihood of meeting the thresholds in ratios between the first poverty level (0-100% of poverty) and the other poverty levels are identified: households in higher poverty levels are less likely to meet the liquidity ratio threshold compared to households with the first poverty level. However, in the DTI ratio and the solvency ratio, households between 100-300% of poverty are more likely to meet the thresholds than the first poverty leveled households.

Introduction

Financially secured condition refers to the ability to access financial resources for maintaining standards of a living (Chaudhuri, 2003; Greninger, Hampton, Kitt & Achacos, 1996; Kim & Lyons, 2008). Financial security has decreased over the last century, and is likely to have increased dramatically in the last few years (Hacker, Huber, Nichols, Rehm, & Craig, 2011). The recent economic recession had a huge negative influence on financial security of households in the U.S. For instance, Hacker, Rehm, and Schlesinger (2010) found that the number of households worrying about their own family's economic security doubled from 12 percent to 24 percent between 2007 and 2009. Those who answered "fairly worried" also increased from 12.2 percent to 28.7 percent while having jobs through the recent economic recession.

Vulnerability of low income households on financial security is more serious problem. Studies indicate that poor households are more vulnerable to changes in this macro level economic environment (Chaudhuri, 2003; Glewwe & Hall, 1998). Indeed, related statistics shows the prevalence and severity of low income households in those periods. Poverty rate has increased by 1.9 percentage point, which means 6.3 million people were newly added in poverty

population. This accounts for approximately 17% increase in the total poverty population (U.S. Census Bureau, 2011).

We expect that the severity of financial insecurity they felt during the economic recession would be stronger than other income leveled households. Therefore, in this paper, we examine financial vulnerability of low income households based on the poverty threshold. The purposes of this study can be identified as follows: 1) to measure financial security of low income households in the U.S., 2) to assess financial security of low income households categorized in different poverty levels, and 3) to analyze determinants of financial security of low income households.

Literature Review

Financial Security

Financial security has multiple dimensions, and an importance of each dimension can be differently valued since there is no agreed definition upon the measurement of financial security, which is generally accepted by financial planning professionals (Kochis, 1996). Various measurements have been developed and discussed in the related studies using both objective and subjective areas (Baek & Devaney, 2004; Lin & Grace, 2007; Moon, Yuh, & Hanna, 2002). However, in general, financial security is often considered as a similar meaning to economic well-being or wellness, defined as access to financial resources needed for a decent standard of living (Greninger et al., 1996; Osberg & Sharpe, 2011), and an opposite meaning to financial vulnerability or instability (Bernheim, Forni, Gokhale, & Kotlikoff, 2003; Lin & Grace, 2007).

Financial Security Ratio (FSR)

Previous studies have developed and implemented financial ratios as analytic tools to assess financial security and well-being of households (Baek & Devaney, 2004; Bernheim et al., 2003; Devaney & Hanna, 1994; Greninger et al., 1996; Prather, 1990). Many financial ratios have been established from the adequacy of emergency funds (DeVaney, 2000; Hackers et al., 2010), overall savings rates (Beak & Devaney, 2004; Greninger et al., 1996), changes in net worth over time (Wakita, Fitzsimmons & Liao, 2000), medical expenditures and insurance premiums (Bernheim et al., 2003; Lin & Grace, 2007; Osberg & Sharpe, 2010), debt levels and insolvency risk (Devaney & Hanna, 1994; Moon et al., 2002; Prather, 1990), to housing expense and affordability (Paulin, 1995). Generally, a single ratio is not expected to be a comprehensive measure of financial security (Devaney, 2000).

The following three points on financial security ratio are frequently addressed in those studies as an assessing tool for financial security: (1) whether or not households maintain adequate liquidity for emergencies, (2) whether or not households avoid excessive debt, and (3) which specific thresholds or cut-off points are suggested in assessing financial security of households (Garman & Fogue, 1997; Greninger et al., 1996; Winger & Frasca, 2000; Moon et al., 2002).

Method

Data and Sample

The data analyzed in this study is from the 2010 Survey of Consumer Finances (SCF). To provide reliable and rich information on the broad financial status of U.S. households, the SCF

has been released triennially by the Federal Reserve Board since 1983. This study follows the sample selection method for poor and low income households used by Hogarth and Anguelov (2003). Our analytic sample is included with income no greater than 3 times the poverty threshold based on U.S. Census Bureau's 2010 report which computes the thresholds by family size, number of dependent children under 18 years, and whether the householder is over 65. Households are categorized by four different poverty thresholds: less than or equal to 100% of the threshold, 101 to 150%, 151 to 200%, and 200 to 300% of the threshold. Our final sample consists of 2,895 households. General characteristics of the sample with respect to categorization in poverty and demographic characteristics were described in the table 1.

Dependent Variable: Financial Ratios

We used three dimensions of ratios as our dependent variable to measure financial security of households. A dummy variable was created and set equal to 1 if the respondents reported that they were financially secure according to that particular ratio. Each ratio presents a different aspect of financial security of the U.S households. More detailed descriptions on each ratio are presented in Appendix I.

Ratio 1: liquidity ratio = liquid assets / monthly income

Liquidity ratio is defined as the ratio of monetary assets to monthly spending (Bi & Montalto, 2004). Monetary assets, also known as liquid assets, include cash and cash-equivalent assets that could be converted for immediate use without a risk of loss (Lytton, Garman, & Porter, 1991). The ratio is associated with the level of monetary assets to the household's monthly expenditures, which indicates how long the household can cover their spending without altering their current standard of living in the event of a financial emergency (Bi & Montalto, 2004; Chang, Hanna, & Fan, 1997; Huston & Chang, 1997). In this study, liquid assets include checking account, saving account, money market account, and call deposit account.

Many studies examined its adequacy based on the number of months each household could maintain their spending against a total loss of income. Although criteria to determine the adequacy would be different depending on the study, a three month criterion has been frequently used (Bi & Montalto, 2004; Devaney, 2000; Moon et al., 2002) This research also use three months income for the criterion to assess the adequate liquidity of the households.

Ratio 2: Debt-to-income ratio=annual debt repayments/annual income

The debt-to-income ratio reflects how much debt burden based on income is risky for households (Beak & Devaeny, 2004; Hanna, Yuh, & Chatterjee, 2012). Basically, this ratio assesses households' ability to pay their debts in relationship to the amount of income (Sullivan, Warren & Westbrook, 2000), thus, revealing the proportion of income used to pay their debts. We define debt income ratio as annual debt payments divided by annual pre-tax income. Debt payments are the total monthly payments on all types of loans, including credit cards, mortgages, lines of credit, home improvement loans, land contracts, other residential property, vehicle loans, student loans, installment loans, margin loans, loans against insurance policies, pension loans and other loans (Hanna et al., 2012).

Households should avoid excessive debt burden, in order to maintain their financial security. From 35% to 40%, many cut-off points are widely suggested to decide risky levels of the debt

burden of households in the literature (Devaney, 2000; Greninger et al, 1996; Hanna et al., 2012). This study uses the 40% threshold as a danger point for households to keep repaying their debt burden.

Ratio 3: solvency ratio = total assets / total liabilities

The solvency ratio shows the debt burden of households in relation to their assets. This ratio assesses which households lack assets to cover their financial burden, as well as those of which may not have an adequate income flow to sufficiently pay their spending and debts. In other words, the solvency ratio is understood as the debt-to-assets ratio. If total debts exceed total assets, the household is technically insolvent (Garman & Fogue, 2006). An excessive use of debt which is more than their ability to pay the debt back may result in bankruptcy, insolvent status. Households having debts less than one half the value of total assets could smoothly secure their solvency status. Therefore, a solvency ratio less than 1.0 is considered insolvent (Devaney, 2000; Kim and Lyons, 2008). This study also use the 1.0 criterion to determine the probability of insolvency of households in terms of their total liability and their assets.

Independent Variable

The independent variables such as demographic characteristics, financial sophistication, and financial attitudinal factors are incorporated in this study. The demographic variables include age, marital status, and race. The financial sophistication variables incorporate education, use of financial planning services, and understanding of the SCF survey questions (Kochis & Hanna, 2013). The financial attitude variables include spending behavior, risk tolerance, and assessment of health.

Results

Means Test

Means tests are used with the repeated-imputation-inference (RII) technique to examine differences of households categorized in different poverty levels on the three ratios. Liquidity ratio is significantly different in each poverty category except households with 0-100%. Approximately 20% of the households are found to meet the three month threshold in the two categories, 200-300% of the poverty level, and 150-200% of the poverty level.

On the other hand, an increasing tendency to meet the ratio threshold by poverty income level is found in the other two ratios. The proportion to meet debt-to-income (DTI) ratio threshold (less than 40%) is lowest at 40.3% for households in 0-100% of poverty, compared to 56.9% in households with 100-150%, 67.3% in those with 150-200% of poverty, and 73.1% for 200-300% of poverty level. For solvency ratio, the result shows a similar pattern to meet the ratio threshold as the above DTI results. The proportion to meet solvency ratio threshold is 87.6% in households with 200-300% of poverty. And the proportion decreases steadily to 69.5% for households with the lowest poverty level.

Multivariate Results

Households in higher poverty levels are less likely to meet the liquidity ratio threshold compared to households with the first poverty level (0-100% of poverty). Households between 100-300%

of poverty are more likely to meet the other two ratios' thresholds, DTI and solvency ratio, than the first poverty leveled households. Both households with a head aged 45 to 54 and 55 to 64 are statistically more likely than those with a head aged 25 to 35 to satisfy the threshold of the solvency ratio, while opposite results are shown in the DTI, these two age groups are less likely to meet the DTI threshold. The difference between DTI and other ratios is also identified in those aged 65 and older: the likelihood to meet liquidity ratio and solvency ratio are higher in heads aged 65 and older than those aged 25 to 34.

Other demographic characteristics such as marital status and race/ethnicity are statistically related to the likelihood of meeting the recommended level of four financial ratios. Married households are more likely to satisfy all ratio thresholds than divorced and never married households. Partnership households are less likely to meet liquidity ratio and solvency guidelines. Households whose spouse died, widow or widower, are more likely to meet the thresholds in the liquidity and solvency ratios. In terms of race/ethnicity, white households are more likely to meet liquidity and DTI ratio guidelines than those of Hispanic households. Black, Asian, and others have less likelihood of meeting the threshold of at least one ratio among the four ratios, compared to white households.

When it comes to financial sophistication, the head's education has a great impact on the possibility of meeting the thresholds. More educated household heads have more chances to meet the cut-off points in liquidity ratio, whereas households with more educated heads show less probability to satisfy the DTI threshold. Experience in using financial planning services has a positive effect on leading to proper liquidity to low income households. Financial understanding of the SCF survey is only positively relevant on the possibility of meeting the liquidity ratio. A series of results with respect to the financial sophistication suggest that a conscious effort or potential to make such an effort in financial planning are important to reach and maintain the recommended liquidity level to low income households.

The financial attitudes of the households are also a significant impact on the probability related to the threshold: tendency to take risk leads to a higher chance of meeting the recommended level to low income households in liquidity, while this tendency results in the less likelihood of satisfying the DTI threshold. On the other hand, households spending more than their income were less likely to meet the thresholds of liquidity, DTI and solvency ratios, while households with the head's poor health condition were less likely to satisfy the thresholds in the liquidity ratio and solvency ratio.

Discussion

First, we implemented the means test to examine differences between households by poverty levels. We found that there is an increasing tendency to meet the ratio threshold as poverty levels decrease in DIT and solvency ratio, but we do not find a certain tendency in liquidity ratio.

Second, there are differences in the likelihood of meeting the thresholds in ratios between the first poverty level and the other poverty levels. Households in higher poverty levels were less likely to meet the liquidity ratio threshold compared to households with the first poverty level (0-100% of poverty). Households between 100-300% of poverty are more likely to meet the thresholds of DTI and solvency ratio than the first poverty leveled households.

Third, for the pattern of age in meeting the thresholds, we find that the liquidity ratio and DTI could support the life cycle hypothesis. According to the life cycle hypothesis, inter-temporal financial decision for smooth consumption can be accomplished by saving for wealth accumulation when income is high, by borrowing when income is low, and by dissaving in retirement (Ando & Modigliani, 1963; Browning & Lusardi, 1996). The related literature indicates that households change consumption across life cycles, and that age, income, marital status, family size, and net worth are related to their financial security and its decisions (Wells & Gubar, 1966). The results, with the probability not to meet the threshold decreases by age, and with the likelihood increases after the 65 and older group in liquidity ratio, could suggest that households increase the liquidity asset as their income increases by age as described in the life cycle hypothesis. Concurrently, a negative probability of DTI threshold implies that households could be more likely to repay their debts as their income and net worth increase by age which is associated with the different life cycle stages. .

Fourth, among financial sophistication variables, education and use of the financial planner variable are positively related to have financial security measured by the liquidity threshold (Bi & Montalto, 2004). On the other hand, education has a negative effect on meeting DTI and solvency ratio recommendations. Such a negative relationship between education and probability of meeting DTI suggest that households would be confident on their debt decisions as long as those with higher education attainment are assumed to have enough cognitive ability to understand their financial circumstance, and to make a rational decision (Hanna et al., 2012). To low income households, financial education and being exposed to this financial service could lead to an increase in their financial security.

Implications and Limitations

This research examines the relationship between poverty levels on the likelihood of meeting the recommended thresholds in the four ratios. The results on the financial security of low income households suggest useful findings in which the poverty level of households faces more severe financial vulnerability after the Great Recession. We expect these findings can provide important insights not only for those interested in public policy related to poverty, but also consumer researchers studying the retirement well-being of U.S. households.

For public policy makers, an important role in financial education and financial planning service to increase the financial security of low income households can be effectively amplified by government programs. More specialized financial education and planning services geared toward low income households such as Individual Development Accounts (IDAs) are called on requests in order to boost the security of the poor households. Greater attention and efforts to provide better access to financial education, and an increase in the level of financial literacy for low income households are needed in order to improve the financial security (Hanna et al., 2012; O'Neill & Richardson, 1999; Xiao et al., 2004).

Relatively little research on financial well-being has been focused on low income households. For low income households, more effective retirement planning aid should be designated to those in poverty. Moreover, future researchers need to improve our understanding of low income households, especially their financial status in various financial aspects.

However, there are some limitations in this research in terms of variable measurements. First, since the SCF does not provide the information of expenditure, we used normal income as a basis of expenditure for our analysis of ratios by following previous studies using the SCF dataset. Second, the recommended levels of each ratio assessing the adequacy of the financial security could be arbitrary to some extent, even though we referenced the related literatures. Third, though we used the three financial ratios for a comprehensive measure instead of a single ratio suggested by Devaney (2000), ratio analysis only provides the relative proportion and levels of security in the low income household.

References

- Ando, A., & Modigliani, F. (1963). The "life cycle" hypothesis of saving: Aggregate implications and tests. *American Economic Review*, 53, 55-84.
- Baek, E., & DeVaney, S. A. (2004). Assessing the baby boomers' financial wellness using financial ratios and a subjective measure. *Family and Consumer Sciences Research Journal*, 32(4), 321-348.
- Bernheim, B. D., Forni, L., Gokhale, J., & Kotlikoff, L. J. (2003). The mismatch between life insurance holdings and financial vulnerabilities: evidence from the Health and Retirement Study. *The American Economic Review*, 93(1), 354-365.
- Bi, L., & Montalto, C. P. (2004). Emergency funds and alternative forms of saving. *Financial Services Review*, 13(2), 93-110.
- Browning, M. & Lusardi, A. (1996). Household saving: Micro theories and micro facts. *Journal of Economic Literature*, 34(4), 1797-1855.
- Chang, Y. R., Hanna, S., & Fan, X. J. (1997). Emergency fund levels: Is household behavior rational? *Financial Counseling and Planning*, 8(1), 47-55.
- Chaudhuri, S. (2003). Assessing vulnerability to poverty: concepts, empirical methods and illustrative examples. *Department of Economics, Columbia University, New York*.
- DeVaney, S.A. (2000). Using financial ratios. In E. T. Garman, J. J. Xiao, & B. Brunsom, (Eds.) *The Mathematics of Personal Financial Planning* (pp. 147-161), Houston: Thompson International Learning.
- Garman, E. T. & Fogue, R. E. (2006). *Personal finance* (8th edition). Boston: Houghton Mifflin Company
- Glewwe, P., & Hall, G. (1998). Are some groups more vulnerable to macroeconomic shocks than others? Hypothesis tests based on panel data from Peru. *Journal of Development Economics*, 56(1), 181-206.
- Greninger, S. A., Hampton, V. L., Kitt, K. A., & Achacoso, J. A. (1996). Ratios and benchmarks for measuring the financial well-being of families and individuals. *Financial Services Review*, 5(1), 57-70.
- Hacker, J. S., Rehm, P., & Schlesinger, M. (2010). Standing on shaky ground: Americans' experiences with economic insecurity. *New York, NY: Rockefeller Foundation*.
- Hacker, J. S., Huber, G. A., Nichols, A., Rehm, P., & Craig, S. (2011). *economic Insecurity and the Great recession*. Technical Report November, Economic Security Index.
- Hanna, S. D., Yuh, Y., & Chatterjee, S. (2012). The increasing financial obligations burden of US households: who is affected?. *International Journal of Consumer Studies*, 36(5), 588-594.
- Huston, S. J., & Chang, Y. R. (1997). Adequate emergency fund holdings and household type. *Financial Counseling and Planning*, 8, 37-46.

- Kim, H., & Lyons, A. C. (2008). No pain, no strain: Impact of health on the financial security of older Americans. *Journal of Consumer Affairs*, 42(1), 9-36.
- Kim, K. T., & Hanna, S. D. (2013). Does Financial Sophistication matter in Retirement Preparedness? Evidence from the 2010 Survey of Consumer Finances, Forthcoming for Consumer Interests Annual, Vol. 59.
- Kochis, S.T. (1996). Practice standards: Building consumer confidence. In Robert N. Veres (Ed.), *The next agenda: A blueprint for the emerging financial planning profession* (pp. 20-22), London: Millennium Press Ltd.
- Lin, Y., & Grace, M. F. (2007). Household life cycle protection: Life insurance holdings, financial vulnerability, and portfolio implications. *Journal of Risk and Insurance*, 74(1), 141-173.
- Lytton, R. H., Garman, E. T., & Porter, N. M. (1991). How to use financial ratios when advising clients. *Financial Counseling and Planning*, 2, 3-23.
- Moon, S. J., Yuh, Y., & Hanna, S. D. (2002). Financial ratio analysis of Korean households. *Family and Consumer Sciences Research Journal*, 30(4), 496-525.
- O'Neill, B., & Xiao, J. J. (2006). Personal finance resiliency assessment quiz. In *2006 Conference Program and Proceedings of Eastern Family Economics and Resource Management Association*. Knoxville, TN, February. (pp.23-25).
- Osberg, L., & Sharpe, A. (2011). *Moving from a GDP-Based to a Well-Being Based Metric of Economic Performance and Social Progress: Results from the Index of Economic Well-Being for OECD Countries, 1980-2009* (No. 2011-12). Centre for the Study of Living Standards.
- Paulin, G. D. (1995). A comparison of consumer expenditures by housing tenure. *Journal of Consumer Affairs*, 29(1), 164-198.
- Prather, C. G. (1990). The ratio analysis technique applied to personal financial statements: Development of household norms. *Financial Counseling and Planning*, 1, 53-69.
- Sullivan, T., Warren, E., Westbrook, J. (2000). *The fragile middle class, Americans in debt*, New Haven, CT: Yale University Press
- Wakita, S., Fitzsimmons, V. S., & Liao, T. F. (2000). Wealth: Determinants of savings net worth and housing net worth of pre-retired households. *Journal of Family and Economic Issues*, 21(4), 387-418.
- Wells, W.D. & Gubar, G. (1966) Life cycle concept in marketing research. *Journal of Marketing Research*, 3, 355-363.
- Winger, B.J. & Frasca, R.R. (2000). *Personal finance: An integrated planning approach* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Table 1 - Characteristics of sample households in the 2010 SCF

Variable	Percentage
Poverty Category	
200 to 300% of poverty	35.2
151 to 200% of poverty	18.5
100 to 150% of poverty	23.0
100% of poverty or less	23.3
Age of head	
25 - 34	16.3
35 - 44	19.2
45 - 54	18.2
55 - 64	16.9
65 and older	29.4
Marital Status	
Married	37.7
Partner	9.0
Separated or Divorced	20.1
Widow or widower	12.1
Never married	21.1
Education of household head	
Less than high school	20.3
High school graduate	39.0
Some college	19.8
B.S degree	20.9
Racial-ethnic category	
White	62.2
Black	18.3
Hispanic	15.3
Asian or others	4.2
Household has poor health	
Yes	38.6
No	61.4
Use of financial planner	
Yes	18.9
No	81.1

Variable	Percentage
Good understanding of the SCF survey Questions	
Yes	82.9
No	17.1
Spending behavior (Spending is larger or equal to income)	
Yes	21.6
No	78.4
Risk tolerance	
No risk	63.2
Average risk	25.5
Above average risk	7.9
Substantial risk	3.4

Note: Restrictions are described in the Methods Section, and include households with income less than 3 times the poverty threshold

Table 2 – Proportion of households to meet each financial ratio threshold with poverty category (Means Test)

Poverty Category^a	Meeting Liquidity threshold	Mean Differences^b	Meeting DTI threshold	Mean Differences	Meeting Solvency threshold	Mean Differences
200 – 300%	19.7%	4.5% ^{***c}	73.1%	32.8% ^{***}	87.6%	18.1% ^{***}
150 – 200%	19.8%	4.6% ^{***}	67.3%	27.0% ^{***}	84.5%	15.0% ^{***}
100 – 150%	11.9%	-3.3% ^{***}	56.9%	16.6% ^{***}	81.2%	11.7% ^{***}
0 – 100% of poverty	15.2%	N/A	40.3%	N/A	69.5%	N/A

a The reference category used in the mean test is indicated in bold face.

b Weighted data; RII technique is used

c Significance test is for mean difference from reference category for each variable.

Table 3 - Logistic regressions analysis of likelihood to meet each financial ratio threshold based on the 2010 SCF

Variable	Liquidity Ratio	Debt to Income (DTI) Ratio	Solvency Ratio
Poverty Category (reference category: 100% of poverty or less)			
200 to 300% of poverty	-0.6461 ^{***a}	1.7665 ^{***}	0.7219 ^{***}
151 to 200% of poverty	-0.4222 ^{***}	1.3921 ^{***}	0.5698 ^{***}
100 to 150% of poverty	-0.8735 ^{***}	0.8661 ^{***}	0.4499 ^{***}
Demographic variables: Age, Marital status, Race/ethnic variable			
Age of head (reference category: age 25 to 34)			
35 - 44	-1.0996 ^{***}	-0.2031 ^{**}	0.0333
45 - 54	-0.8571 ^{***}	-0.4503 ^{***}	0.1704
55 - 64	-0.4283 ^{***}	-0.4415 ^{***}	0.5642 ^{***}
65 and older	0.3394 ^{**}	-0.2469	0.5299 ^{***}
Marital status (reference category: Married)			
Partner	-0.9683 ^{***}	-0.1101	-0.8540 ^{***}
Separated or Divorced	-0.5004 ^{***}	-0.2873 ^{***}	-0.4794 ^{***}
Widow or widower	0.5922 ^{***}	0.1688	0.4088 ^{**}
Never married	-0.3474 ^{**}	-0.2952 ^{***}	-0.8914 ^{***}
Racial-ethnic category (reference category: White)			
Black	-0.7702 ^{***}	0.2154 ^{**}	-0.4869 ^{***}
Hispanic	-0.8045 ^{***}	-0.4614 ^{***}	-0.0904
Asian or others	-0.1232	-0.2340	0.3515
Financial sophistication variables: Education, Use of financial service, Good understanding of survey			
Education of household head (reference category: Less than high school)			
High school	0.5872 ^{***}	-0.3370 ^{***}	-0.0754
Some college	0.6442 ^{***}	-0.7168 ^{***}	-0.5151 ^{***}
Bachelor degree	1.3387 ^{***}	-0.9975 ^{***}	-0.4527 ^{***}
Use of financial planner (reference category: No)	0.3530 ^{***}	-0.1549 ^{***}	0.0263
Good understanding of the SCF survey question	0.4663 ^{***}	-0.0593	0.00581

Variable	Liquidity Ratio	Debt to Income (DTI) Ratio	Solvency Ratio
(reference category: Poor understanding)			
Financial attitudinal variable: Risk tolerance, Spending behavior, Poor health			
Risk tolerance (reference category: Take no risk)			
Average risk	0.5533***	-0.2058**	0.2919**
Above average risk	0.6231***	-0.4736***	0.0608
Substantial risk	0.5611***	-0.2611	-0.3204
Spending behavior – deficit (reference category: No)			
Poor health (reference category: No)	-0.3025**	-0.6391***	-0.7356***
Concordance (mean)	77%	72.4%	71.3%

^a Unweighted RII analysis of 2010 SCF dataset
Significance level: *** $\alpha=0.01$, ** $\alpha=0.05$

Appendix 1: Definition of Financial Ratios

Financial Ratio	Definition & Description
Liquidity ratio	<p>Liquidity ratio = liquid assets / monthly income (If monthly income = 0, ratio = liquid assets)</p> <p>Liquid assets = Checking + Saving account + Money Market account + Call deposit account</p>
Debt-to-income ratio	<p>Debt-to-income ratio = monthly debt repayments / monthly income (If monthly income = 0, ratio = monthly debt payments)</p> <p>Monthly debt payments = total of monthly payments on all types of loans, including credit cards, mortgages, lines of credit, home improvement loans, land contracts, other residential property, vehicle loans, student loans, installment loans, margin loans, loans against insurance policies, pension loans and other loans.</p>
Solvency ratio	<p>Solvency ratio = Total assets / Total liabilities (If total liability = 0, ratio = total assets)</p> <ul style="list-style-type: none"> - Total assets = total financial assets + total non-financial asset - Total financial asset = liquidity asset + certificates of deposit + mutual fund + stocks + bond + total quasi-liquid (IRA + Thrift + pension + currently received benefit) + saving bonds + cash value of life insurance + other managed assets (trusts + annuity) + other financial assets (loans from the household to someone else, future proceeds, royalties, futures, non-public stock, deferred compensation, oil/gas/mineral invest., cash) - Total non-financial asset = housing assets + vehicle + other residential real estate + non-housing real estate + business asset + other non-financial asset - Total liabilities = housing debt (mortgage, home equity loans etc.) + repayment on installment and credit purchases + credit card debt + vehicle loans, education loans, and other installment loans + other debts (loans against pensions, loans against life insurance, margin loans, miscellaneous)