Factors Related To Risk Tolerance

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Effects of financial and demographic variables on risk tolerance were estimated for households with an employed respondent in the 1992 Survey of Consumer Finances. Logistic regression analysis showed that female headed households were less likely to be risk tolerant than otherwise similar households with a male head or a married couple. Differences in risk tolerance by gender/marital status, ethnic group and education could be due to differences in understanding of the nature of risk.
KEY WORDS: *risk tolerance, individual investors, Survey of Consumer Finances*

Introduction

Risk tolerance plays an important role in each household's optimal portfolio decisions. It may also be an important factor in determining many government policies related to consumer risks regarding financial decisions. An investor's ability to handle risks may be related to individual characteristics such as age, time horizon, liquidity needs, portfolio size, income, investment knowledge, and attitude toward price fluctuations (Fredman, 1996). It has been widely perceived that, for financial planners, it is essential to make an effort to determine every investor's risk tolerance level using a subjective measure (Mittra, 1995). However, there may be objective as well as subjective aspects of risk tolerance.

Malkiel (1996, p. 401) stated that "The risks you can afford to take depend on your total financial situation, including the types and sources of your income exclusive of investment income." In their study, Hanna and Chen used an expected utility and simulation approach to derive optimal portfolios, based on risk aversion and the ratio of a household's financial investment portfolio to total wealth, including human wealth. Hanna and Chen (1995) demonstrated that the ratio of financial assets to total wealth (including human wealth) was an important determining what level of volatility was optimal for a portfolio, and that ratio would tend to be related to such objective factors as years until retirement. Based on plausible assumptions about risk aversion and the actual distribution of the ratio of financial assets to total wealth in the United States (Lee & Hanna, 1995b) Hanna and Chen concluded that it would be rational for most households to have only stocks in portfolios intended for long run goals such as retirement. For younger workers investing for retirement, willingness to accept some risk (volatility) would lead to substantially greater wealth at retirement (Chen & Hanna, 1996).

The purpose of this paper is to investigate effects of financial variables and individual characteristics on risk tolerance, with the most recent appropriate dataset, the 1992 Survey of Consumer Finances (SCF.) Because retired households face very different portfolio issues from those who are not retired, only working respondents aged between 16 and 70 were included in the analysis. The results have implications for financial counselors and financial planners in providing portfolio advice to their clients.

Literature Review

A number of articles have analyzed factors related to risk tolerance. Using the 1983 Survey of Consumer Finances, Hawley and Fujii (1993) employed ordered logit models to investigate effects of net worth and individual characteristics on risk tolerance. The study included economically active respondents aged 25-62. Education, income and debt were positively related to risk tolerance. Married couples and households headed by a single male were more risk tolerant than otherwise similar households headed by a single female. Age was not statistically significant in the analysis. The Hawley

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and Fujii (1993) are consistent with results from Warner and Cramer (1995) and Lee and Hanna (1995a). Using 1983 SCF data on risk tolerance, Lee and Hanna (1995a) derived the distribution of dichotomous risk tolerance level by demographic groups. Of 2,691 respondents in the sample, 60% were willing to take financial risks. Predicted risk tolerance was approximately the same for all ages under 55, then decreased with age. Predicted risk tolerance increased with education.

Using the 1983 SCF risk tolerance data, Sung and Hanna (1996) employed an ordered probit model of a 3-level dependent variable to analyze effects of income and demographic variables on risk tolerance. They found that income and education were positively related to risk The general pattern from the dummy variables for age was that risk tolerance decreased with age after 45. Self-employed and farmers were significantly likely willing to take financial risks than their counterparts.

This article is different from previous studies on risk tolerance in use of the 1992 Survey of Consumer, and in specifying factors that should be logically related to the household's ability to tolerate risk, such as years to retirement. This article is also unique in extensive use of graphs to illustrate patterns of risk tolerance.

Theoretical Model

Hanna and Chen (1995) used an expected utility approach to demonstrate that it is optimal for almost all households with an investment horizon of at least five years to invest in stocks, despite higher volatility. Hanna and Chen assumed that the expected utility of a household is based on the total wealth of the household, including human wealth. For young households, the investment portfolio represents such a small proportion of total wealth that even those who are very risk averse should invest in the asset category with the highest expected return, small stocks. As households approach, human wealth typically decreases and financial wealth typically increases. The investment horizon becomes shorter, ultimately becoming less than a year for households depending on investment income for ordinary living expenses. Therefore, the number of years until expected retirement should be related to a household's risk tolerance. Having short-term goals should also be related to risk tolerance. For instance, if a household has not yet accumulated its desired level of emergency funds, its investment horizon may be very short, in that it cannot tolerate much volatility in investments until emergency funds have been accumulated. Therefore, the premise in this article is that only factors related to having important short-term goals should be important in not being willing to take some risk in obtaining a higher return on financial investments. Households who do not have adequate financial assets to cover emergencies or perhaps even normal month-to-month transactions may not be in a position to invest in stocks or other risky assets.[a] Those who might have other short-term goals, such as saving for a down payment for a home, also might not be in a position to invest in risky assets. We assume that for those with long investment horizons being unwilling to take some chances to obtain a higher return on investments indicates a lack of information, as it is not rational to be unwilling to take some risk for long-term goals.

Methodology

Data and Sample

The dataset for this study is the 1992 Survey of Consumer Finances (SCF). The Survey is sponsored by the Federal Reserve Board in cooperation with the Department of the Treasury and conducted by the National Opinion Research Center at the University of Chicago. The SCF was primarily designed as an instrument for the study of assets and liabilities.

In this study, respondents who were working, were aged between 16 and 70, and had positive non-investment income were included, resulting in a sample of 2,659 respondents.

Dependent Variable

The 1992 SCF had a question on financial risk tolerance. The possible responses and the distribution of responses for the present sample are shown in Table 1. Although it would seem reasonable to analyze the distribution of all four response levels to the risk tolerance question, the *substantial risk* category is so small that meaningful analysis of it is not appropriate for multivariate analysis with many variables such as education, race, age and income. By combining the *substantial* and *above average* risk categories, multivariate analysis may be appropriate, as 18% of the respondents in this sample were in the combined category. Appendix Table 2 presents mean income and the distribution of the risk tolerance categories of *no risk, substantial* and *above average* categories, for demographic variables. There is no consistent pattern of risk tolerance categories. For instance, there was little difference between the proportion of married couples and male-headed households in the *average* risk category, yet male-headed households were much more likely to be in the *above average/substantial* risk tolerance category than were

married couples. Therefore, two levels of risk — *no risk* and *average/above average/substantial* risk tolerance (referred to simply as *risk tolerant*) are used in the dependent variable. In the sample, 60% of households were risk tolerant and 40% were not risk tolerant.

Independent Variables

The independent variables are non-investment income and dummy variables representing whether liquid assets were equal to at least 3 months of non-investment income, whether non-liquid assets were equal to at least 6 months of non-investment income, household size, age, number of years until expected retirement, education, race/ ethnicity, occupation, self-employed, marital status and gender. Definition of variables, their measurement, and their sample statistics are shown in Appendix Table 1.

Table 1
Distribution of Answers to Risk Tolerance Question In Sample From 1992 Survey of Consumer Finances*

1. When you save or make investment, would you take substantial financial risks expecting to earn substantial returns. 3.7%
2. When you save or make investment, would you take above-average financial risks expecting to earn above-average returns. 14.6%
3. When you save or make investment, would you take average financial risks expecting to earn average returns. 42.1%
4. When you save or make investment, would you take no financial risks. 39.6%

*Sample used consisted of respondents who were working, age between 16 and 70, and had positive non-investment income, n= 2659

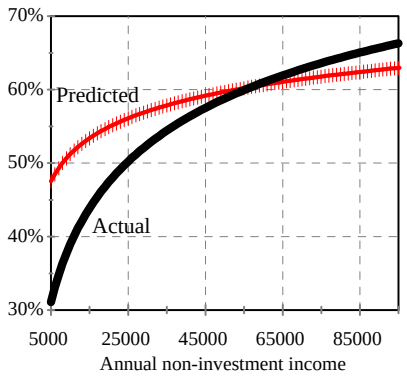
Analysis

For descriptive purposes, the results were weighted to reflect the general population of households.[b] Chi square statistics were calculated to test for significant bivariate risk tolerance differences in sets of variables. A logit model was employed in order to identify effects of variables on risk tolerance.[c]

Results

Table 2 shows differences in risk tolerance for the independent variables. All variables except age and years to retirement were significantly related to risk tolerance. Logit results are shown in Table 3. Most of the sets of independent variables had significant effects, except for household size, occupation, and homeownership status. The patterns with some significant differences in the logit are illustrated in Figures 1 through 7 as the *predicted* graphs, and for comparison, the bivariate patterns are shown as the *actual* graphs. The *actual* patterns may be useful to someone interested in inferring risk tolerance from one characteristic, such as marital status. The *predicted* patterns provide insight into the effect of a variable after controlling for the effects of other variables.

Figure 1.
Effect of Non-investment Income on Risk Tolerance.



Predicted based on Table3 (other variables at mean values.) *Actual* based on logit of risk tolerance on log of non-investment income only.

Effects of Non-investment Income The level of non-investment income had a positive effect on risk tolerance. Figure 1 shows the effect of income on predicted risk tolerance, calculated with other variables at their mean values.[d] The predicted probability of being risk tolerant increased with non-investment income, reaching 60% at a level of $50,000. For comparison, a logistic regression of risk tolerance as a function of only non-investment income was run, and the "actual" risk tolerance by income was calculated and shown in Figure 1.

Effects of Liquid and Non-liquid Financial Assets. Households with liquid assets greater than or equal to 3 months of non-investment income had a predicted risk tolerance of 70%, compared to a predicted level of 58% for otherwise similar households who did not meet the 3 month guideline. Households with non- liquid assets greater than or equal to 6 months of non-investment income had a predicted risk tolerance of 73%, compared to a predicted level of 58% for otherwise similar households who did.

Table 2
Bivariate (Actual) Risk Tolerance Patterns

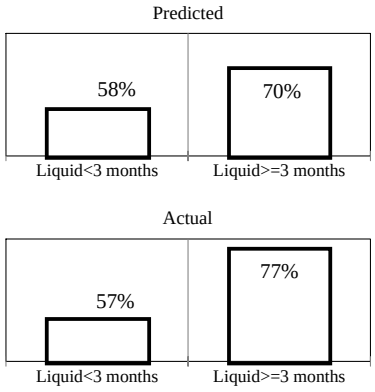
Variables		% Risk tolerant
Total sample		60.4
		Chi-square
Liquid assets$3 months income	77.2	61.0‡
Liquid assets<3 months income	57.1	
Non-liquid financial assets$6 months income	74.1	96.2‡
Non-liquid financial assets<6 months income	54.0	
Self-employed	71.3	25.3‡
Not self-employed	58.2	
Years until expected retirement		6.6
Retire in 0-9 years	52.6	
Retire in 10-19 years	59.5	
Retire in 20-29 years	61.9	
Retire in 30 and over	61.1	
Age		4.8
Age less than 25	57.4	
Age 25-34	63.1	
Age 35-44	60.8	
Age 45-54	59.0	
Age 55 and over	57.3	
Education		222.8‡
Less than high school	32.7	
High school graduate	52.1	
Some college	60.7	
More than college	76.3	
Race or Ethnicity (%)		80.5‡
Non-Hispanic White	64.8	
Hispanic	47.6	
Non-Hispanic Black	38.4	
Non-Hispanic Other	56.2	
Household size (%)		17.4†
Size 1	64.1	
Size 2	60.1	
Size 3	61.5	
Size 4	62.6	
Size 5 and more	51.3	
Marital status (%)		64.6‡
Couple	62.5	
Single male	70.0	
Single female	45.9	
Occupation		128.55‡
Managerial/professional/support	73.0	
Technical/sales/administrative support	60.4	
Service occupations	44.4	
Precision production/craft/repair	58.5	
Operators/fabricators/laborers	45.2	
Farming/forestry/fishing	58.3	
Homeownership		30.55‡
Renting or other alternatives to owning	54.9	
Own without a mortgage	53.8	
Own with a mortgage	66.2	

Source: The Survey of Consumer Finances, 1992. (N=2,659) All estimates are weighted. * p<.05 †p<.01 ‡ for p<.001.

Effects of the Number of Years to Retirement Figure 4 shows differences in risk tolerance among categories of number of year until expected retirement.[e] Those who were 30 years or more away from retirement had significantly higher risk tolerance than otherwise similar respondents whose expected retirement was closer.

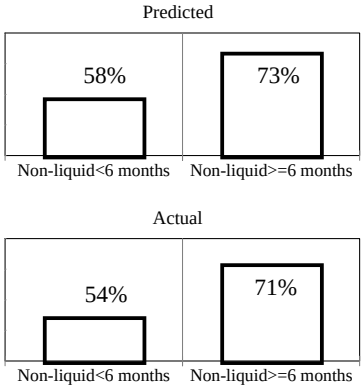
Race/Ethnic Group Non-Hispanic whites had higher predicted risk tolerance than Hispanics or those in other racial/ethnic groups other than Blacks (Figure 6). (The predicted level for non-Hispanic Blacks is lower than the level for whites, but the difference is not significant at the 0.05 level.) Non-Hispanic Blacks had the lowest actual risk tolerance level (Figure 6), but the predicted level (holding other variables at the sample mean values) was second only to non-Hispanic whites.

Figure 2.
Effect of Having Liquid Assets Equal To At Least 3 Months on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

Figure 3.
Effect of Having Non-liquid Assets Equal To At Least 6 Months on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

Effects of Education Predicted risk tolerance increased with education, even after controlling for the effects of other variables. As shown in Figure 5, when other variables were held at their mean values, the predicted risk tolerance was 43% for respondents who did not graduate from high school, 54% for those with a high school diploma only, 62% for those with some college, and 71% for those with a college degree.

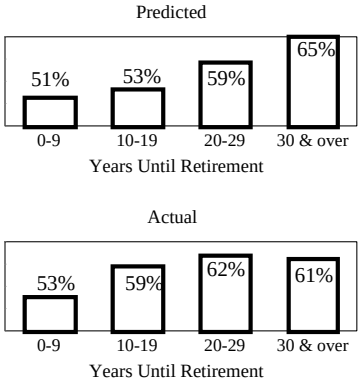
Table 3
Logit Analysis on Risk Tolerance

Variables	Coefficient	sig.level
Non-investment income (log of $1000's)	0.2140	.000‡
Liquid assets>3 months of income	0.5120	.000‡
Non-liquid fin. assets>6 months of income	0.6671	.000‡
Number of years until expected retirement		
Retire in 0-9 years	-0.5684	.005†
Retire in 10-19 years	-0.4949	.002†
Retire in 20-29 years	-0.2491	.048*
Education (vs. High school graduate)		
Less than high school	-0.4438	.012†
Some college	0.2569	.058
More than college	0.7327	.000‡
Race or Ethnicity (vs. Non-Hispanic White)		
Hispanic	-0.4636	.021*
Non-Hispanic Black	-0.2987	.080
Non-Hispanic Other	-0.4988	.022*
Household size (vs. Size 2)		
Size 1	0.1964	.283
Size 3	-0.0839	.548
Size 4	-0.0580	.695
Size 5 and more	-0.2262	.172
Occupation (vs. farming/forestry/fishing)		
Managerial & professional specialty	-0.0963	.754
Technical/sales/administrative support	-0.2036	.508
Service occupations	-0.4345	.187
Precision production/craft/repair	-0.1393	.659
Operators/fabricators/laborers	-0.5219	.099
Self-employed	0.3436	.005†
Marital Status (vs. Single female)		
Single male	0.8377	.000‡
Couple	0.5513	.001‡
Home ownership (vs. no home ownership)		
Home ownership without mortgage	-0.1300	.434
Home ownership with mortgage	0.2111	.085
Constant	-0.8386	.016*
F-value	15.329	.000‡
Number of Observations	2,659	

Source: The Survey of Consumer Finances, 1992.
*p<.05, †p<.01, ‡p<.001.

Other Variables There were no significant differences among households of different sizes when other variables were controlled, although the actual level of risk tolerance was lower for households with 5 people than for other sizes (Table 2). Households with a self-employed head tended to be significantly more risk-tolerant than those that did not have a self-employed head (Figure 8). Other occupation variables were not significantly related to risk tolerance when other variables were controlled, although the actual risk tolerance for households headed by someone in a managerial/professional occupation was higher than those in other occupations (Table 2). Home ownership status also did not have significant effects on risk tolerance with other variables were controlled.

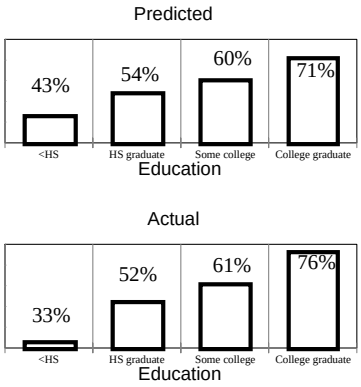
Figure 4.
Effect of the Number of Years Until Expected Retirement on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

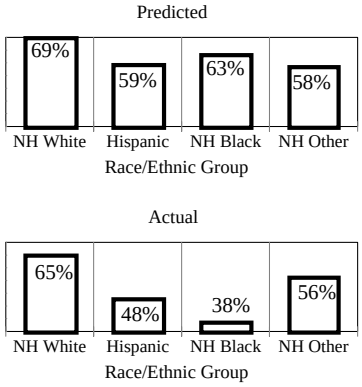
Marital Status Risk tolerance was lower for female-headed households. With other variables set at the mean values for the sample, predicted risk tolerance levels were 48% for female-headed households, 62% for couples, and 68% for male-headed households (Figure 7).

Figure 5.
Effect of Education on Risk Tolerance.



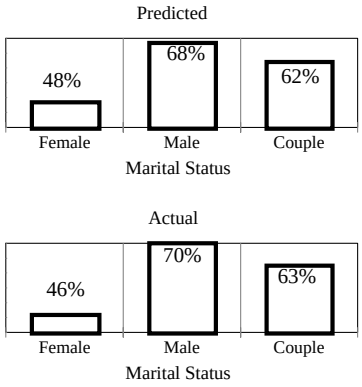
Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

Figure 6.
Effect of Race/Ethnic Status on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2. "NH" denotes non-Hispanic.

Figure 7.
Effect of Marital/Gender Status on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

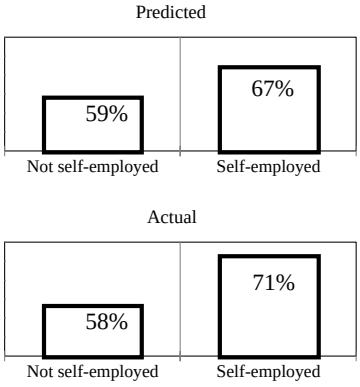
The logit results in Table 2 can be used to predict extremely low or high levels of risk tolerance. For instance, a household with non-investment income of $100,000, with a white, non-Hispanic head, married couple, retirement 30 years away, college degree, household size of 2, occupation manager, homeowner with mortgage, would have a predicted probability of being risk tolerant of 92%. In contrast, a household with income of $20,000, Hispanic, female-headed household, retirement in 10 to 19 years, education level of 12 years, household size of 5, occupation as operator (e.g., factory worker) and renter would have a predicted probability of being risk tolerant less than 11%.

Implications

Objective Versus Subjective Risk Tolerance Factors

Several variables related to risk tolerance are logically related to objective risk tolerance as proposed by Hanna and Chen (1995). Households with sufficient financial assets for short-term goals, such as emergency funds, were more likely to say they were willing to take some risk than were otherwise similar households who did not have sufficient financial assets. Similarly, those who were 30 or more years away from retirement and those who had higher non-investment income were more likely to say they were risk tolerant than were otherwise similar households who were closer to retirement or had lower income.

Figure 8.
Effect of Self-Employment on Risk Tolerance.



Predicted based on Table 3 (other variables at mean values.) *Actual* based on Table 2.

Other variables that were significantly related to the answer to risk tolerance might seem to reflect purely subjective differences. For instance, the fact that Hispanics were less risk tolerant than otherwise similar White non-Hispanics might reflect a purely cultural difference. However, it is equally plausible that the difference reflects a lack of understanding of the nature of financial risk. It is also possible that the groups with predicted lower risk tolerance had more uncertainty about non-investment income, even though some objective factors such as occupation and education were controlled.

Households with a self-employed head had high risk tolerance, despite the fact that it would be reasonable for a self-employed person to tolerate less risk in financial investments than an otherwise similar person who was not self-employed. Income from self-employment is presumably more variable than income from wages or salaries, so the financial portion of the total household portfolio should be more stable, all other things equal. However, apparently people who choose self-employment are generally less risk averse than those who choose a wage or salary job.

Implications for Financial Planners

The *actual* patterns shown in the graphs give some indication of differences in risk tolerance. However, some of the patterns observed may be due to other factors. For instance, homeowners with mortgages are more risk tolerant than renters and homeowners without mortgages. However, if years to retirement and other variables are taken into account, there is no significant difference among the housing groups. If a financial planner simply wishes to respect the preferences of clients, giving the client some type of risk tolerance questionnaire (e.g., Mittra, 1995) may be reasonable. Short of that, it might seem reasonable to use the types of results reported here, and recommend more conservative investments to female-headed households, Hispanics, less educated households, and lower income clients. Clearly, however, the objective factors should be the most important consideration. Does the client have enough liquid assets to cover likely emergencies? Are their important goals with horizons of less than 5 years? How far away is retirement?

For clients with longer term goals, such as those investing for a retirement that is more than 10 years away, simply taking a client's aversion to risk at face value is questionable. As Hanna and Chen (1995) demonstrated, even with a 5 year horizon and high risk aversion, households should have some stocks in their portfolios.

Implications for Educators

The groups that had lower predicted risk tolerance, even after controlling for objective factors, are logical targets for education about the nature of financial risks. Racial/ethnic groups other than non-Hispanic whites, less educated, and female-headed households would be appropriate groups to target. It might also be reasonable to target those who are 10 to 30 years away from retirement, as it is reasonable to include some riskier assets in their portfolios.

Implications for Research

A multivariate analysis of the SCF risk tolerance variable using all or three of the levels of responses would be useful. The differences observed for gender/marital status should be the subject of additional research, analyzing separate responses of husbands and wives. The results of this article suggest that married couples are more like households headed by a single male than like households headed by a single female, as the predicted risk tolerance level of households headed by a single male is not significantly different from that of otherwise similar married couples. Does this mean that husbands make most of the financial decisions? Does this pattern exist in younger married couples?

Use of the SCF risk tolerance variable as an independent variable is common. Researchers should be careful interpreting its effects, as the variable seems to have both objective and subjective components.

Endnotes

a. Clements (1995) suggested that it may be reasonable for some people to use stocks as basis for an emergency fund. However, the standard advice is to have liquid assets amounting to 3 to 6 months of income or expenses (Chang & Huston, 1995).

b. Weighted mean values from the multiple imputation were derived using a weight variable, x42000 divided by the number of imputations in the data set, 5, according to the guidelines suggested in the 1992 SCF Codebook (Montalto & Sung, 1996).

To obtain a sufficiently large and unbiased sample of wealthier families, the 1992 SCF with 3,906 respondents has employed a two-part sampling strategy; 2,456 standard multistage area-probability sample to provide good coverage of the general population and 1450 list sample selected from tax data to over-represent families that tend to be wealthy. To compensate for complete nonresponse, an adjustment procedure has been done by weight variables and statistical methods has been applied to missing information on individual items in order to impute missing data (Kennickell and Star-McCluer, 1994). To deal with selection biases, the Survey undertook intensive nonresponse analysis in constructing weight variables. Missing information in the SCF has been imputed five times using draws from estimates of the conditional distribution of the data (Kennickell, 1996). All data sets from five imputations were used in this analysis (Montalto & Sung, 1996; Kennickell & McManus, 1994)

c. *When a dependent variable is binary, a logit model is a possible econometric alternative. The estimates of a parameter vector in the logistic regression model tells the direction of predicted probabilities of corresponding independent variables while the marginal effects tells their magnitudes. A model with binary dependent variable assumes that there is an underlying response variable* y_i^* *defined by the regression relationship*

$y_i^* = X_i \beta + \varepsilon_i$

where y_i^* *is a latent variable indicating household i's taste for taking financial risks,* X_i *is a vector of household characteristics that affect taking financial risks, such as non-investment income, the ratio of liquid assets or non-liquid financial assets to income, age, education, race or ethnicity, etc.,* β *is a parameter vector to be estimated, and* ε_i *is an error term that denotes an unexplained part*

of the behavior. Since y_i can not be observed, it is necessary to define an observed binary variable y_i as*
y_i = 1
if y_i > 0, i.e., household i takes financial risks*
= 0 otherwise,
and it is observed from the Survey whether households take financial risks.
As stated in endnote a, there are five imputations in the 1992 SCF. In this study, Rubin's (1987, pp. 76-78) procedure was done by using LIMDEP. Estimates of five set of parameter vectors and variance-covariance matrices from five imputations were used to derive 'true' values of parameter estimates and their significance levels as well as to derive test statistics for model fitness.

d. The predicted probability based on estimated logit parameters, if all independent variables are set at mean values, does not produce the sample mean for the probability. Therefore, to make the graphs realistic, an adjustment factor was used in all graphs based on the logit (the *predicted* values.)

e. Logistic regression analyses were done with both age and the number of years until expected retirement, and only with age. When both age and the number of years until expected retirement were included in logistics regression, none of the age and years until retirement variables were significant. When only age was included in the logistic regression, the dummy variables for age 45-54 and age 55 and more had significant negative effects on risk tolerance.

Appendix

Definition of Variables

Mean values from five imputations were calculated according to the guideline suggested in the 1992 SCF Codebook.

Non-Investment Income. Non-investment income consists of income from various income sources: wages and salaries; a professional practice or farm; unemployment or worker's compensation; child support or alimony; income from ADC, AFDC, food stamps, or other form of welfare or assistance, such as SSI; income from annuities, or disability benefits; and other income.

Assets. Liquid assets was defined as transaction accounts including checking, savings, and money market accounts. Non-liquid assets was defined as financial assets excluding liquid assets. And then, the ratios of liquid assets and non-liquid financial assets to monthly non-investment income were calculated. Finally, a dummy variable representing liquid assets as emergency funds was coded 1 if liquid assets was equal to or greater than 3 months of non-investment income while another dummy variable representing non-liquid assets as emergency funds was coded 1 if non-liquid assets was equal to or greater than 6 months of non-investment income.

The Number of years until expected retirement. For respondents working at full-time as well as at part-time, the number of years until expected retirement was defined from Questionnaires in the Survey: "In what years do you expect to stop working altogether." And then, it was categorized into four dummy variables according to the number of years, i.e., 0-9 years, 10-19 years, 20-29 years, and 30 years and over.

Occupation. In the 1992 SCF, occupations were classified into 6 categories according to the 1980 U.S. Census Occupation Code: managerial and professional specialty; technical, sales, administrative support; service; precision production, craft, repair; operators, fabricator, laborers; farming, poultry, fishing.

Race or Ethnicity. In the 1992 SCF, race or ethnicity were classified into 4 categories such as Hispanic, non-Hispanic black, non-Hispanic white, and others (American Indian, Asian, and other). The SCF public use tape did not separate the *other* category for confidentiality reasons.

Appendix Table 1 shows the variables and the distribution of the variables.

Appendix Table 1
Definition and Sample Mean of Independent Variables (N=2,659)

Variables Definition	Mean
Non-investment income ($)	51700
Liquid assets$3 months of income	
1 if yes; 0 otherwise	16.07%
Non-liquid financial assets$6 months of income	
1 if yes; 0 otherwise	31.38
The number of years until retirement	
Retire in 0-9 years, 1 if yes; 0 otherwise	8.18
Retire in 10-19 years, 1 if yes; 0 otherwise	17.23
Retire in 20-29 years, 1 if yes; 0 otherwise	26.80
Retire in 30 and over (reference category)	47.79
Education	
Less than high school, 1 if yes; 0 otherwise	11.96
High school graduate (reference category)	29.33
Some college, 1 if yes; 0 otherwise	23.41
Bachelor's degree or more, 1 if yes; 0 otherwise	35.29
Race or Ethnicity	
Non-Hispanic White (reference category)	75.82
Hispanic, 1 if yes; 0 otherwise	7.91
Non-Hispanic Black, 1 if yes; 0 otherwise	11.48
Non-Hispanic Other, 1 if yes; 0 otherwise	4.80
Marital status	
Couple (reference category)	65.51
Single male, if yes; 0 otherwise	14.76
Single female, 1 if yes; 0 otherwise	19.73
Household size	
Size 1, 1 if yes; 0 otherwise	18.68
Size 2, (reference category)	27.92
Size 3, 1 if yes; 0 otherwise	19.73
Size 4, 1 if yes; 0 otherwise	19.41
Size 5 and more, 1 if yes; 0 otherwise	14.26
Occupation	
Managerial&professional, 1 if yes; 0 otherwise	33.29
Technical/sales/administrative support,	
1 if yes; 0 otherwise	25.82
Service occupations, 1 if yes; 0 otherwise	10.45
Precision production/craft/repair,	
1 if yes; 0 otherwise	12.74
Operators/fabricators/laborers,	
1 if yes; 0 otherwise	15.07
Farming/forestry/fishing, (reference category)	2.63
Self-employed, 1 if yes; 0 otherwise	15.95
Home ownership	
Rent/ no home ownership, (reference category)	36.43
Home ownership without mortgage,	
1 if yes; 0 otherwise	13.57
Home ownership with mortgage,	
1 if yes; 0 otherwise	50.00

Appendix Table 2

Distribution of Risk Tolerance Levels by Financial and Individual Characteristics

Variables	No Risk	Average Risk	Above Average/ Substantial Risk
Entire sample	39.6	42.1	18.2
Non-investment income($)	39820	56850	65632
Liquid assets$3 months income(%)	22.8	53.9	23.3
Non-liquid financial assets$6 months income(%)	25.9	49.6	24.5
Number of years until expected retirement			
Retire in 0-9 years	47.4	40.6	12.0
Retire in 10-19 years	40.5	42.7	16.7
Retire in 20-29 years	38.1	43.4	18.5
Retire in 30 years and over	38.9	41.4	19.7
Education			
Less than high school	67.3	26.4	6.4
High school graduate	47.9	39.3	12.8
Some college	39.3	41.0	19.6
More than college	23.7	50.4	25.8
Race or Ethnicity			
Non-Hispanic White	35.2	45.9	18.9
Hispanic	52.4	30.5	17.1
Non-Hispanic Black	61.6	24.3	14.1
Non-Hispanic Other	43.8	39.2	16.9
Household size			
Size 1	35.9	45.1	19.0
Size 2	39.9	41.8	18.3
Size 3	38.5	43.3	18.2
Size 4	37.4	43.4	19.1
Size 5	48.7	35.3	16.0
Self-employed	28.7	45.7	25.7
Marital status			
Couple	37.5	44.0	18.5
Single male	30.0	42.4	27.6
Single female	54.1	35.7	10.2

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