# Does Greater Complexity Reduce Retirement Adequacy? Evidence from The Survey of Consumer Finances, 1995-2007

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## Abstract

Fudenberg's (2006) model of bounded rationality posits that greater complexity should result in households being less likely to achieve rational outcomes. Some households have higher complexity in retirement planning because expected retirement income varies during retirement. Based on 1995 to 2007 Survey of Consumer Finances datasets, about 73% of households have more than one stage. When income stages are taken into account, the proportion of households with retirement adequacy overall increased from 44% in 1995 to 58% in 2007, and in each year the proportion was much lower than estimates ignoring income stages. The combined stage adequacy proportion ranges from 44% to 58% with stage partition. Our multivariate analysis shows that households with more than one stage are more likely to have an adequate retirement than households with only one stage, contrary to Fudenberg's model, perhaps because of unmeasured differences in characteristics of households with multiple retirement stages. Controlling for other variables, retirement adequacy does not vary significantly during the 1995 to 2007 period.

## Introduction

Previous retirement adequacy studies have ignored expected retirement income stages. Studies that ignore retirement income stages result in biased estimations of retirement adequacy. In this study, the effect of having more than one planned retirement income stage is first analyzed theoretically and then empirically. The effect of having multiple retirement income stages on retirement adequacy is tested with means tests, and then, conditional on other characteristics, using a logistic regression. Retirement adequacy is estimated using a version of Palmer's (1992, 1994) required retirement ratio concept. The main purposes of this study are to explore how many planned retirement income stages are held by households and to analyze the effect of taking stages into account on projected retirement adequacy. Another purpose is to estimate changes in U.S. retirement adequacy from 1995 to 2007.

## Literature Review

Does the complexity of retirement planning, as measured by whether multiple retirement income states are expected, influence the likelihood of obtaining retirement adequacy, as measured by whether optimal consumption smoothing will be achieved? Although generally speaking, judgments and choices are intuitive, skilled, unproblematic, and reasonably successful (Klein, 1998), Tvershy and Kahneman (1986) have shown that the complexity of framing effects results in consumer mistakes. The reasoning process is impaired by the complexity of situation, and therefore, people tend to have bounded rationality when making decisions. Bounded rationality refers to the way that people use rules of thumb to derive consequences for their actions (Fudenberg, 2006). In behavioral economics, people are more likely to use heuristic methods such as a rule of thumb to make decisions (Fudenberg, 2006). When using a rule of thumb, people might not take into account some important information and are more likely to make irrational decisions.

### Retirement Adequacy

Chen (2007) reported that previous research studies on retirement adequacy of working households have produced a wide range of estimates, from 31% to 80% adequate. Court, Farrell, and Forsyth (2007) analyzed retirement adequacy of baby boomers (born from 1946 to 1964). After they formally retired, 60% of boomers will need to work just to maintain 80% of their current consumption, and more than 40% (29 million) will be working at age 65. Munnell, Webb and Golub-Sass (2007) used the 2004 SCF to compare replacement rates with a benchmark rate defined as adequate. They concluded that 43% of households sampled in 2004 will not be able to maintain their standard of living in retirement even if they retire at age 65. Hurd and Rohwedder (2011) performed 100 simulations of consumption and wealth paths of a sample of 66-69 year-olds by using data from the Health and

Retirement Study (HRS) and data from the Consumption and Activities Mail Survey (CAMS). They concluded that 71% of persons in the target age group were adequately prepared for retirement.

Retirement income stage

A few studies have discussed retirement stages, although none have taken retirement stages into account in projecting retirement adequacy of current workers. Everett and Anthony (2003) discussed classifying retirement into stages for planning calculations, but did not attempt to empirically assess adequacy. No previous published studies on retirement adequacy except for Chen and Hanna (2005) and Chen (2007) have attempted to address the technical question of calculating retirement adequacy by accounting for retirement income stages.

In this study, a retirement income stage is defined as a period in which the real income remains constant. In practice, some events might cause small changes in nominal income, for example, changes in income tax rules. Therefore, to have a more meaningful and technically feasible definition, only projected changes in the number of income sources are considered. Thus, an income stage is formally defined as a period in which the projected number of income sources is constant. Whenever the projected number of income sources changes, one new stage is created. The income stage starts with the planned retirement age and ends when the individual dies. The maximum stage number for a married household is eight, based on the stage drivers of Social Security retirement benefit, Defined Benefit pension, and part-time job wage. (For more details on the literature and methods related to retirement adequacy, contact the first author of this paper.)

## Methods

Data and sample selection

In this study, the 1995, 1998, 2001, 2004 and 2007 Survey of Consumer Finance (SCF) datasets are used to test the empirical result. The sample is composed of households with the head or spouse/partner who is age 35 to 70, and employed full time. The age restriction was used for reasons similar to those discussed by Yuh, Montalto, and Hanna (1998), that it can be difficult to accurately project careers and investments for workers younger than 35, as jobs, marital status, and contributions to retirement accounts might not be set for younger workers. Yuh et al. also discussed restricting their analysis to workers under age 70 because there is no additional benefit in Social Security benefits to working beyond that age. Also, the Internal Revenue Service requires that withdrawals begin from Individual Retirement Accounts when a worker reaches age 70 ½. About 16% of the sample households responded that they will never retire. For those households, we assumed that their planned retirement age equals the 70. Also, we assumed that households who expected to work part-time after retirement from a full-time job and who expected to never retire from the part-time job would retire at age 75. There were also some technical restrictions related to implausible projections of life expectancy, resulting in a final total sample size of 8,435 (Table 1).

Our calculation of resources during retirement was somewhat similar to the methods reported by Chen (2007), with calculation of retirement income from projected retirement assets combined with estimated income from Social Security pensions, defined benefit pensions, and part-time wages. For our descriptive reporting of the number of retirement income stages, we counted all stages. However, for our analyses of retirement adequacy, for households with more than two stages, we combined all stages but the last stage into one new stage. Our calculation of spending needed in retirement also generally followed the assumptions used by Chen (2007) and are similar to those of Palmer (1992; 1994). We estimated spending benchmarks from the Bureau of Labor Statistics 2007 Consumer Expenditure Survey published results and projected amounts above the published income categories using power function estimation from the lower income categories.

Multivariate Analysis

The dependent variable of logistic regression is a dichotomous variable with value equal to 1 if the replacement ratio is greater than the benchmark replacement ratio; otherwise, it is equal to 0. Independent variables such as demographic variables, economic status variables, and financial attitude variables are incorporated. The demographic variables include age, education, race, and marital status. The economic status variables include having a defined benefit pension, having a defined contribution pension, normal income, and expectation of working part-time after retirement from a full-time job. The financial attitude variables include spending behavior, risk tolerance, expectation of an inheritance, and assessment of health. In addition, dummy variables for survey year are used to test for a time trend. The SCF data has five complete data sets called “implicates” as a result of multiple imputation to handle missing data (Rubin, 1987; Montalto, Yuh, & Hanna, 2000). This study also uses repeated-imputation inference (RII) techniques to combine the five different data sets to make valid inferences (Rubin, 1987; Montalto et al., 2000; Montalto & Sung, 1996).

## Results

Stage Effect

About 27% of households have one stage, 35% have two stages, and almost 39% have more than two stages (Table 2). Quite a few households (5%) have more than 5 stages. Single heads and couple households where both plan to retire at age 62 or later in the same calendar year and have only one source of retirement income other than pensions would typically have only one retirement income stage. As shown in Table 3, 33% plan to retire before age 62, and almost 64% plan to have a part-time job after retirement from full-time work, and both of these patterns would result in multiple retirement income stages. Over 20% of households have defined benefit pension plans. Many households have multiple retirement income stage drivers: different planned retirement age, defined benefit pensions, and part-time jobs.

Table 4 shows the median length of household stages by the total number of stages. The median length of New Stage 1 is the sum of the lengths of the first N-1 old stages. The length of New Stage 2 is the difference between remaining life expectancy and the length of New Stage 1. The total length of New Stage 1 and New Stage 2 is equal to the remaining life expectancy at retirement. For example, consider a household with three stages. The length of Stage 1 is 3 years, Stage 2 is 4 years and life expectancy is 30 years. First Old Stage 1 and Old Stage 2 are combined into New Stage 1. The Old Stage 3 would be New Stage 2. Therefore, the length of New Stage 1 is 7 years (3+4 years). The length of New Stage 2 is 23 years (30-7years).

For non-couple households, the beginning of retirement is when the head plans to retirement from a full-time job. For couple households, the beginning of retirement is also based on the first year that the head plans to retire, unless the spouse is currently employed full-time and plans to retire in a year before the head plans to retire. Retirement income stages are defined based on both the situation of the head and of the spouse/partner in terms of Social Security eligibility and employment plans. The earlier age of first retirement, the more likely a household will have multiple stages as shown in Table 4. For example, households with four stages have a median first retirement age of 56, compared to the median first retirement age of 65 for households with only one stage. In general, if the first retirement age is before 62 there will be more than one retirement stage because the household will have to wait until the head turns 62 to start receiving the Social Security pension. The last stage length decreases as the households have more stages. For example, households with three stages have a last stage length of 15.7 years, while households with seven stages have last stage length of 10.3 years. The reason for this phenomenon is because first N-1 stages already count part of the life expectancy, so that the last stage length decreases.

The length of the first stage is generally longer than that of the middle stages. Households with two stages have a median first retirement age of 65, suggesting that a second stage is not generated only by retirement before the minimum Social Security age of 62. It is often generated by having a defined benefit pension and a part-time job. In contrast, households with more than two stages have a median first retirement age before age 62 and it is likely that the first stage results from retirement before the minimum Social Security age of 62. This can be verified by adding the length of first stage to the first retirement age which results in an age close to 62. For example, in households with four stages, the length of first stage is 7 years, and the first retirement age is 56. The sum of 6 and 55 is 63, which is very close to minimum Social Security age of 62. Since the first stage usually happens before age 62, and middle stages usually happen between 62 and 65, the length of the first stage is generally greater than that of middle stages.

Replacement Ratio

The combined dataset is segmented by three categories. Category 1 includes households with two New Stages and with projected retirement assets high enough to allow for equal spending in New Stage 1 income and New Stage 2. Category 2 includes households with two New Stages but lacking sufficient projected retirement assets to have equal spending in the two stages. Category 3 includes households with only one stage.

As Table 5 shows, the median replacement ratio ranges from 53% to 120% across categories and new stages. If stage partitions are ignored, the replacement ratio ranges from 53% to 265%. As expected, the replacement ratio ignoring stage partition is much higher than with stage partition, because the method ignoring stage partition recognizes all retirement income at the first planned retirement age. In contrast, the method with stage partition recognizes retirement income when income really occurs. The overestimation of the replacement ratio is substantial for households in category 1. Comparing the replacement ratio in category 1 between stage partitions and ignoring the stage partition, the average overestimation of replacement is around 130%. Within each survey year, the replacement ratio is highest in Category 1, but is lowest in Category 3. This is because households in Category 3 are less likely to have defined benefit pensions and part-time jobs.

With stage partition, the median replacement ratio of Category 1 steadily increased from 1995 to 2004 and dropped in 2007. There was no apparent year pattern for the replacement ratio of Category 2 and Category 3. If stage partitions are ignored, Category 2 has the similar trend as Category 1 with stage partition, and Category 1 and 3 have no obvious patterns over time.

Table 6 shows mean retirement adequacy proportions based on the benchmark replacement ratios. The mean retirement adequacy proportion ranges from 26% to 83% across categories and new stages. Ignoring stage partitions, the proportion ranges from 26% to 98%. It is as expected that the retirement adequacy proportion ignoring stage partition is higher than that with stage partition because the median replacement ratio of ignoring stage partition is higher. There was no apparent year pattern across the categories. Within each survey year, the adequacy proportion is highest in Category 1, but is lowest in Category 3 except the New Stage 1 in 1995.

For Category 1, the adequacy proportion steadily increased across years. The retirement adequacy proportion of New Stage 1 and New Stage 2 steadily increased from 1995 to 2001 and dropped in 2004 and 2007 for Category 2. The retirement adequacy ratio in Category 3 dropped from 1995 to 1998 but increased from 2001 to 2007. Within the same year, the adequacy proportion is highest in category 1, but is lowest in category 3 except 1995. The across categories combined results are presented in Table 7. Under the stage partition method, the average adequacy proportion steadily increased from 1995 to 2004, with 2007 about the same as 2004. Ignoring stage partitions, the adequacy proportion has a pattern similar to that with stage partitions, except that the proportions are over-estimated by 23% to 28%.

Multivariate Results

As shown in Table 8, households with more than one stage are more likely to have an adequate retirement than households with only one stage. This result is contrary to Fudenberg's model, which may perhaps be due to the unmeasured differences in characteristics of households with multiple retirement stages. Also, the retirement adequacy does not vary significantly during the 1995-2007 period. Not surprisingly, the likelihood of having an adequate retirement increased with the age of planned retirement.

Having a defined benefit pension and having a defined contribution pension is positively related to the likelihood of adequate retirement. This result is consistent with results reported by Yuh, et al. (1998). White households are more likely than Black households to have an adequate retirement. The current age of the head is not related to retirement adequacy, although since we are also controlling for planned retirement age, it is likely that the result that those age 65 to 70 are not different from the youngest age group is due to multicollinearity. The education of head is not significantly related to the likelihood of having an adequate retirement, except that those with a bachelor's degree or higher are more likely than high school dropouts to have adequacy.

As risk tolerance increases, the likelihood of having an adequate retirement increases. Married couple households are more likely than separated/divorced, widowed and never married households to have an adequate retirement. Households with income under $10,000 per year are more likely to have retirement adequacy (to achieve spending as high as current spending) than those in the $10,000 to $49,999 income range. Households in the $50,000 to $99,999 income range are not different from those in the lowest income category in projected retirement adequacy. Households in the highest income category ($100,000 or greater) are much more likely than those in lower income categories to have retirement adequacy. Those who consider themselves in good or excellent health are more likely to have retirement adequacy than those who consider themselves in poor or fair health. Lastly, the 89.4% concordance shows the model does a very good job of predicted retirement adequacy.

## Discussion

The result that greater complexity is associated with higher levels of retirement adequacy is puzzling, and requires more in-depth study. The result that accounting for retirement income stages gives much lower levels of retirement adequacy than estimates ignoring stages is an extremely important result, and future researchers on retirement adequacy need to carefully consider retirement income stages.

Our multivariate analysis shows that retirement adequacy does not vary significantly during the 1995-2007 period. Based on the result tables, no apparent pattern of trend over the survey years was detected.

Financial planners and households planning for retirement need to consider retirement income stages. Retirement income stages represent multiple income cash flows. In other words, a household with more retirement income stages have more income cash flows. Due to the complexity of cash flow management, discrepancies may exist in forecasting the timing and amount of future cash flow. Such discrepancies could result in financial planning failures. Therefore, better understanding of retirement income stage analysis by financial planners is necessary to reduce the risk of such financial planning failures for their clients.

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**Table 1**
*Sample Size by Survey Year*

| SCF Survey year | Sample size with restriction | Sample size without restriction |
|---|---|---|
| 1995 | 1,453 | 4,299 |
| 1998 | 1,605 | 4,305 |
| 2001 | 1,675 | 4,442 |
| 2004 | 1,903 | 4,519 |
| 2007 | 1,799 | 4,418 |
| Total | 8,435 | 21,983 |

Note. Restrictions are described in the Methods Section, and include head or spouse/partner being 35 or older, but no more than 70, and head and/or the spouse being in the labor force. The

**Table 2**
*Distribution of Number of Retirement Income Stages*

| Stages | Percentage | Cumulative Percentage |
|---|---|---|
| 1 | 26.52 | 26.52 |
| 2 | 34.63 | 61.15 |
| 3 | 21.65 | 82.80 |
| 4 | 11.87 | 94.67 |
| 5 | 4.71 | 99.38 |
| 6 | 0.60 | 99.98 |
| 7 | 0.02 | 100.00 |

**Table 3**
*Characteristics of households in the sample (1995-2007 SCF)*

| Variables | (%) |
|---|---|
| **Age of head** | |
| Less than 35 | 2.19 |
| Between 35 and 44 | 40.63 |
| Between 45 and 54 | 34.94 |
| Between 55 and 64 | 18.66 |
| 65 and over | 3.58 |
| **Highest education of head** | |
| Less than high school | |
| High school graduate | 9.66 |
| Some college | 30.33 |
| B.S degree or more | 18.61 |
| | 41.40 |
| **Marital status** | |
| Married | |
| Partner | 61.39 |
| Separated or Divorced | 6.52 |
| Widow or widower | 20.10 |
| Never married | 2.73 |
| | 9.26 |
| **Household income** | |
| Less than $10,000 | |
| Between $10,000 and $24,999 | 1.17 |
| Between $25,000 and $49,999 | 11.32 |
| Between $50,000 and $99,999 | 30.38 |
| Between $100,000 and over | 36.59 |
| | 20.54 |
| **Racial-ethnic status of respondent** | |
| White | |
| Black | 75.77 |
| Hispanic | 11.93 |
| Asian and others | 8.07 |
| | 4.23 |
| **Household defined contribution pension plan** | |
| Yes | |
| No | 25.71 |
| | 74.29 |
| **Household defined benefit pension plan** | |
| Yes | |
| No | 20.37 |
| | 79.63 |
| **Head's planned retirement age** | |
| retire age <**62** | |
| **62**<=retire age<=**65** | 33.30 |
| Retire age>**65** | 39.93 |
| | 26.77 |
| **Has retirement as saving purpose** | |
| Yes | |
| No | 58.39 |
| | 41.61 |

| Variables | (%) |
|---|---|
| **Risk tolerance** | |
| Take no risk | 32.69 |
| Take average risk | 42.91 |
| Take above average risk | 20.29 |
| Take substantial risk | 4.11 |
| **Spend more than current income** | |
| Yes | 13.37 |
| No | 86.63 |
| **Household has more than one stage** | |
| Yes | 73.48 |
| No | 26.52 |
| **Household plans part-time job after retirement** | |
| Yes | 63.77 |
| No | 36.23 |
| **Household expects inheritance** | |
| Yes | 15.46 |
| No | 84.54 |
| **Household has good health** | |
| Yes | 80.36 |
| No | 19.64 |

Note: dollar amounts for income are adjusted to 2007 prices.

**Table 4**
*Median Period Length of Old Stage and New Stage*

| Median Period Length subgroup by stages (SCF 1995-2007) | | | | | | | | Median New Stage Length | | First Retirement Age |
|---|---|---|---|---|---|---|---|---|---|---|
| | p1 | p2 | p3 | p4 | p5 | p6 | P7 | newN1 | newN2 | |
| 1 stage | 21.71 | | | | | | | 24.32 | | 65 |
| 2 stages | 6 | 12.87 | | | | | | 6 | 12.87 | 65 |
| 3 stages | 9 | 2 | 15.68 | | | | | 11 | 15.68 | 60 |
| 4 stages | 7 | 5 | 2 | 14.16 | | | | 16 | 14.16 | 56 |
| 5 stages | 6 | 3 | 4 | 2 | 12.25 | | | 19 | 12.25 | 55 |
| 6 stages | 4 | 2 | 3 | 2 | 2 | 12.01 | | 19 | 12.01 | 55 |
| 7 stages | 2 | 2 | 1 | 2 | 1 | 2 | 10.26 | 16 | 10.26 | 56 |

Note. This table is a summary of aggregate data result.

**Table 5**
*Median Income Replacement Ratios by SCF 1995-2007*

| | 1995 | 1995 | 1998 | 1998 | 2001 | 2001 | 2004 | 2004 | 2007 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| With Stage Partition | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 |
| Category1 | 109% | 109% | 111% | 112% | 118% | 120% | 119% | 119% | 115% | 116% |
| Category2 | 78% | 75% | 93% | 81% | 93% | 86% | 85% | 80% | 88% | 82% |
| Category3 | 67% | N/A | 53% | N/A | 66% | N/A | 64% | N/A | 62% | N/A |
| No Stage Partition | 1995 | | 1998 | | 2001 | | 2004 | | 2007 | |
| Category1 | 230% | | 240% | | 265% | | 248% | | 238% | |
| Category2 | 181% | | 192% | | 195% | | 196% | | 200% | |
| Category3 | 67% | | 53% | | 66% | | 64% | | 62% | |

Category 1: Households have two New Stages. New stage 1 spending and New Stage 2 spending *can* be equalized by accumulated retirement assets.
Category 2: Households have two New Stages. New stage 1 spending and New Stage 2 spending *cannot* be equalized by accumulated retirement assets.
Category 3: Households have only one stage.

**Table 6**
*Mean Retirement Adequacy Proportion by SCF 1995-2007 (Compared to Benchmark Replacement Ratio)*

| | 1995 | 1995 | 1998 | 1998 | 2001 | 2001 | 2004 | 2004 | 2007 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| With Stage Partition | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 | New Stage 1 | New Stage 2 |
| Category1 | 67% | 67% | 71% | 71% | 79% | 79% | 82% | 82% | 83% | 83% |
| Category2 | 29% | 35% | 37% | 33% | 46% | 43% | 44% | 43% | 50% | 42% |
| Category3 | 32% | N/A | 26% | N/A | 33% | N/A | 35% | N/A | 38% | N/A |
| Overall proportion, accounting for stages | 44% | | 47% | | 55% | | 57% | | 58% | |
| No Stage Partition | 1995 | | 1998 | | 2001 | | 2004 | | 2007 | |
| Category1 | 96% | | 96% | | 98% | | 96% | | 97% | |
| Category2 | 83% | | 89% | | 93% | | 94% | | 96% | |
| Category3 | 32% | | 26% | | 33% | | 35% | | 38% | |
| Overall proportion, ignoring stages | 71% | | 76% | | 78% | | 82% | | 81% | |

Category 1: Households have two New Stages. New stage 1 spending and New Stage 2 spending *can* be equalized by accumulated retirement assets.
Category 2: Households have two New Stages. New stage 1 spending and New Stage 2 spending *cannot* be equalized by accumulated retirement assets.
Category 3: Households have only one stage.

**Table 7**
*Retirement Adequacy Difference between Stage Partition Method and Non-Stage Partition Method*

| | 1995 | 1998 | 2001 | 2004 | 2007 |
|---|---|---|---|---|---|
| Stage 1 | 43% | 48% | 55% | 57% | 59% |
| Stage 2 | 45% | 47% | 54% | 57% | 56% |
| Average of S1 & S2 | 44% | 47% | 55% | 57% | 58% |
| Non-stage partition | 71% | 76% | 78% | 82% | 81% |
| Difference between adequacy rates ignoring stage partition and counting stage partition | 28% | 28% | 23% | 25% | 23% |

**Non-stage partition estimate is based on the assumption that all retirement income is realized at the beginning of Stage 1.**

**Table 8**
*Logistic Regression of Retirement Adequacy (with stage partition)*

| Variable | Coefficient | p-value [a] | Standard Error | Odds ratio |
|---|---|---|---|---|
| More than one stage | 1.0922 | <.0001 | 0.1056 | 2.981 |
| Year: reference category:1995 | | | | |
| 1998 | -0.0674 | 0.5211 | 0.1052 | 0.935 |
| 2001 | 0.0984 | 0.3525 | 0.1065 | 1.103 |
| 2004 | 0.1302 | 0.2357 | 0.1097 | 1.139 |
| 2007 | 0.1522 | 0.1514 | 0.1061 | 1.164 |
| Planned retirement age: reference category : before 62 | | | | |
| 62 ≤ Retirement age ≤ 65 | 0.9790 | <.0001 | 0.0868 | 2.662 |
| Retirement age > 65 | 1.7535 | <.0001 | 0.1075 | 5.775 |
| Plan part-time job | -0.0112 | 0.9167 | 0.1027 | 1.185 |
| Have Defined Contribution plan | 0.7492 | <.0001 | 0.1107 | 2.115 |
| Have Defined Benefit pension | 1.4436 | <.0001 | 0.1043 | 4.236 |
| Racial-ethnic category: reference category: White | | | | |
| Black | -0.3667 | 0.0034 | 0.1254 | 0.693 |
| Hispanic | -0.2085 | 0.1551 | 0.1474 | 0.812 |
| Asian or others | -0.2489 | 0.1623 | 0.1777 | 0.780 |
| Age of head: reference category: age 55 to 64 | | | | |
| 25 - 34 | 0.4148 | 0.1203 | 0.2663 | 1.514 |
| 35 - 44 | 0.0714 | 0.4769 | 0.1003 | 1.074 |
| 45 - 54 | 0.1893 | 0.0481 | 0.0957 | 1.208 |
| 65 - 70 | 0.2584 | 0.1546 | 0.1818 | 1.295 |
| Education of head: reference category: less than high school | | | | |
| High school | 0.1520 | 0.2381 | 0.1291 | 1.164 |
| Some college | 0.0907 | 0.5371 | 0.1469 | 1.095 |
| Bachelor degree or higher | 0.3332 | 0.0204 | 0.1437 | 1.395 |
| Risk tolerance: reference category: Take no risk | | | | |
| Average risk | 0.5495 | <.0001 | 0.0924 | 1.732 |
| Above average risk | 0.8807 | <.0001 | 0.1053 | 2.413 |
| Substantial risk | 0.9939 | <.0001 | 0.1617 | 2.702 |
| Marital status: reference category: married | | | | |
| Partner | -0.0706 | 0.5943 | 0.1330 | 0.932 |
| Separated or divorced | -1.6925 | <.0001 | 0.1047 | 0.184 |
| Widow | -1.4092 | <.0001 | 0.2241 | 0.244 |
| Never married | -1.4318 | <.0001 | 0.1352 | 0.239 |
| | | | | |

| Variable | Coefficient | p-value [a] | Standard Error | Odds ratio |
|---|---|---|---|---|
| Household income: reference category : less than $10,000 | | | | |
| $10,000 - $24,999 | -1.3017 | 0.0001 | 0.3450 | 0.272 |
| $25,000 - $49,999 | -0.6818 | 0.0336 | 0.3233 | 0.506 |
| $50,000 - $99,999 | -0.2159 | 0.5152 | 0.3383 | 0.806 |
| More than $100,000 | 1.8793 | <.0001 | 0.3613 | 6.549 |
| Current deficit (spend greater than income) | -0.3323 | 0.0038 | 0.1149 | 0.717 |
| Have good health | 0.4872 | <.0001 | 0.0886 | 1.628 |
| Expect inheritance | 0.2018 | 0.0255 | 0.0904 | 1.224 |
| Concordance (mean) | 89.4% | | | |

[a] Significance level and standard error based on RII technique.