

# The Determinants of Planned Retirement Age

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## Abstract

Montalto, Yuh and Hanna (2000) analyzed the planned retirement age of respondents using the 1995 Survey of Consumer Finances (SCF). For a sample of households with respondents age 35 to 70, they analyzed determinants of working full-time, and for those working full-time, the determinants of planned retirement age. The purpose of this paper is to partially replicate the planned retirement equation used in Montalto, et al. by using the 1995, 1998, 2001, 2004, and 2007 SCF, in order to see if planned retirement age had changed, controlling for changes in other factors. Mean planned retirement age increased from under 62 in 1995 to over 63 in 2007. Based on a logistic regression on planned retirement age, planned retirement age was 0.6 years higher in 2007 than in 1995, after controlling for net worth, current age, and other characteristics.

## 1. INTRODUCTION

People's planned retirement age has a big impact on many social issues, especially the social security system. It is hard to analyze accurately the sufficiency of the social security reserve without accurately estimate people's planned retirement age. According to the data from the U.S Census Bureau in 2009, people age 65 and over are made up of 12.5 percent of the whole population. Moreover, according to the CRS report for the Congress, the demographical change of the United States can be summarized in one sentence, that is "The United States is getting bigger, older and diverse." According to this report, the proportion of people who aged at 65 and over will increase rapidly in the future due to the low birth rate and the low immigration rate. It is projected that by year 2050, people aged 65 and over will hit 88.5 million which is 20% of the whole population in the United States by that time. The increase of old people is quite impressive in the coming 40 years.

The significant increase in the percentage of old people forces us to rethink the viability of our current social security system. According to the U.S Social Security Administration, a person must be at least 61 years and 9 months old to apply for the retirement benefit. Then we have a question about the sufficiency of the current social security funding. Kotlikoff, Smetters and Walliser (2007) in their research pointed out that in the next 30 years when over 77 million baby boomers retire, 15% more workers in the workplace will support twice the number of elderly through social security benefit and the Medicare. By that time, the social security system is seriously fall short due to the demographical change of the United States.

How to keep the social security system solvent has experienced a long political debate. Hanna, Yuh and Montalto's research of retirement adequacy (1998) indicates that retirement adequacy is influenced by total assets accumulated upon retirement age, pension income, consumption level,

retirement age and life expectancy. The planned retirement age directly determined the projection of retirement adequacy because it directly determined the time period that is included in the calculation of retirement assets.

The estimate of social security retirement also includes the estimate of the planned retirement age and the continuing income from the workplace and consumption level. In order to keep the social security solvent, many professionals gave good suggestions. For example, the Economist magazine has pointed out that, to save the social security system, three things can be done: first, the government can issue debt to cover the deficit; second, to cut the benefit to an affordable amount; third, to raise the tax to fund the social security system. Some scholars even suggest privatizing the social security system to make it more efficient.

However, among the suggestions provided by previous studies, few of them paid attention to the planned retirement age. If the age to apply for the retirement benefit changes, for example, from 62 to 65, the social security system may suffer from less pressure because the time periods covered by the retirement benefits decrease but the contributions made to the social security system increase.

The practical meaning of the planned retirement age raised our interests to see the planned retirement age changes over the last 15 years (from 1992 to 2007). Montalto, Yuh and Hanna (2000) article provides a good starting point. The purpose of this partial replication is to include the 1995-2007 SCF datasets to see the trends of the planned retirement age as well as possible new findings in terms of the significance of independent variables.

## **2. LITERATURE REVIEW**

There have been many studies on the retirement planning issues. Some variables are shown to be relevant to the planned retirement age. Also, some studies have indicated that planned retirement age is very important to the current social security system.

Fieldstein (1974) examined the impact of social security on the individuals' decision about retirement and saving. The results showed that personal savings, accumulation of capitals are depressed by social security benefit. The lack of incentive of saving and capital accumulation induced early retirement.

Boskin (1977) have found that the poor health as well as the guaranteed income and implicit tax on earnings greatly affect people's retirement decisions. They found that the social security benefit, as one of the guaranteed retirement income sources, actually induced people to retire earlier.

Pellechio (1978) used Current Population Survey to estimate the effect of Social Security wealth on the labor supply of older men in the 1970s and 1980s. Results indicate that people who received lower social security benefit tends to withdraw earlier from the workplace compared with their cohorts with higher social security benefit. This once again proved that social security benefit has a great impact on people's retirement decisions.

Crawford and Lilien (1981) modeled the effect of social security benefit, private pensions and other forms of insurances on individual's retirement decisions. They argued that the deviation from fairness causes the social security benefit to induce early retirement. However, if there is no such a deviation, that is to say, if the lifetime is certain, the capital market is perfect and the social security benefit is actuarially fair, the social security benefit should not have an impact on the retirement age. Another finding would be the ownership of insurance does have an effect on early retirement.

Fields and Mitchell (1982) investigated the how the structure of earnings and pension opportunities affect retirement behavior. Different from previous studies, this study found that sometimes people's retirement income is even higher than their net labor income. The article concludes

that people's retirement decisions are negatively influenced by base income but positively influenced by the expected gain by postponing retirement.

Sueyoshi (1989) examined the determinants of retirement behaviors using the competing risk model which simulates full-time retirement and part-time retirement. The results show that the significant social security benefit increase in 1970 only has moderate effect on the early retirement.

Stock and Wise (1990) examined the effect of firm pension plans on the older employees. They conducted their research in a large firm with defined benefit plan. They analyzed the option value of continued to work. They found that a person will continue to work if the benefit of working is more than the benefit of retiring now. They also found that the defined contribution plan (if the firm switch from the defined benefit plan to a defined contribution plan) has no age-specific incentive effects.

To sum up, previous studies provide evidence that social security benefit might have an effect on early retirement. Other factors that could have an effect on the retirement age include the health status, pension plans and the income. The insurance might be a factor and should be included in the future research. There could be more variables that can be included in the equation that are not quite mentioned by the previous research, for example, employment status, demographical characteristics and education level. The SCF provides sufficient information on all these variables.

### **3. Conceptual Framework**

In this article, the key part of the conceptual framework is to define the term "retirement". Currently, there are several definitions of "retirement", include: self-reported retirement; termination of work or looking for work; termination of full-time work; working less than a given number of hours; leaving the main employer; and receipt of an employer-provided pension or social security benefit. The choice of independent variables in the planned retirement age equation suggested by the original article embodied these conceptual frameworks. However, unlike the original article, we combined all financial variables as one financial variable which is the net worth. The reason for this change is that the net worth is believed to be more accurately reflect one's asset accumulation and the ability to afford retirement.

The replication, just like the original article did, defines retirement as occurring when an individual stops working full-time which is the most commonly used definition in empirical studies. Like the previous studies, a planned retirement age must take into account the adequacy of resources, whether working will be plausible and the individual's preferences for leisure. The SCF allows the examination of several of these factors.

### **4. Hypotheses**

The original article has several hypotheses regarding the possible relationship between the dependent variables and the independent variables. The replication will follow those hypotheses and assumes that the each independent variable is correlated with the dependent variable. The similar prediction equation will also be employed in the replication process. In the original article, there are 27 dependent variables. However, in the replication, we have 19 variables due to two reasons. First, we substitute the several financial variables in the original article by "net worth". Second, we forgo variables with large amount of missing value (employed spouse/partner). The only dependent variable in the planned retirement age equation is the "planned retirement age". There are 19 independent variables as the equation shows. The 19 variables can be categorized as financial variables and head's demographical variables.

The prediction equation used in the replication is as follows:  $\text{Planned retirement age} = \alpha_0 + \alpha_1 \text{Log}(\text{net worth}) + \alpha_2 \text{household size} + \alpha_3 \text{retirement saving goal} + \alpha_4 \text{poor health} + \alpha_5 \text{self-employed} + \alpha_6 \text{technical} + \alpha_7 \text{service} + \alpha_8 \text{precision/repair} + \alpha_9 \text{operator} + \alpha_{10} \text{farming} + \alpha_{11} \text{life expectancy} + \alpha_{12} \text{age} + \alpha_{13} \text{age-squared} + \alpha_{14} \text{black non-hispanic} + \alpha_{15} \text{hispanic} + \alpha_{16} \text{other} + \alpha_{17} \text{high school} + \alpha_{18} \text{some college} + \alpha_{19} \text{years}$

The hypotheses are summarized as follows: the hypotheses are similar to the original article except using the net worth to substitute the several financial variables in the original article.

## **5. Method**

### **5.1 Data Set**

Data from the 1995-2007 Survey of Consumer Finances were used for the analysis. The survey is sponsored by the U.S. Federal Reserve Board in cooperation with the U.S. Department of the Treasury and it is conducted every three years since 1983. Telephone interviews were conducted to collect relevant information about the participants' demographical characteristics (age, race, education level and etc.) and financial information (balance sheets, income, pension and the use of financial institutions). The replication combined 1995-2007 SCF, resulting in a combined dataset consists of 20,223 households, among which 4,299 households from 1995, 4,305 households from 1998, 4,442 households from 2001, 4,519 households from 2004, and 4,418 households from 2007. The sample size, therefore, is large enough to provide relatively robust estimates of effects.

### *5.2 Sample Selection*

As the original article did, heads of household age 35-70 were selected for the planned retirement age analysis. Heads under age 35 and over age 70 were deleted from the combined dataset. The original article used the Heckman's two-step estimation procedure to estimate a planned retirement age equation. The first step is to run a probit analysis to estimate the probability of working full-time for the full sample of heads age 35 to 70. The probit results are then used to estimate the selection bias correction variable for each observation. In order to run the first step of Heckman selection procedure, only individuals working full time are selected. However, because the results from the first step were not significant in Montalto, et al. (2000), in the replication, we skipped the Heckman selection procedures and only used the regression procedure to estimate the planned retirement age.

### *5.3 Measures*

The OLS regression model will be utilized in the analysis. The original article used the RII techniques to combine data from all five implicates of the SCF to generate the coefficient estimates of the planned retirement age equation. In the replication, we used the method suggested by Lindamood, Hanna and Bi (2007), weights are used to generate descriptive analysis results. However, weights are not used in the multivariate analysis, but just averaged across the five implicates.

#### *5.3.1 Dependent Variable*

The dependent variable in the replication is the planned retirement age which is estimated by OLS regression based on the sub-sample of household head aged 35 to 70. This variable is created based on the question (x7728) and answers (x7727) in the SCF, with a value -2 indicating "never stop" and 0 "inapplicable". Following the procedures in Montalto et al. (2000), households that were not in full-time employment were deleted and those who said they would never retire were deleted.

### 5.3.2 Independent Variable

There are 19 independent variables in the planned retirement age equation. The independent variables can be categorized as financial variables, variables capturing access to resources, characteristics of employment and head's demographic characteristics.

#### *Financial Variable*

In the original article, the financial variables include amounts of noninvestment income, financial assets excluding retirement assets, non-financial assets, debt and retirement assets. Financial variables are measured as the natural logarithm to reduce unequal variance of the disturbances. In the replication, as stated before, the log (net worth) is used to better reflect people's assets accumulation to afford retirement. The descriptive analysis was conducted to reach the mean percentage of log (net worth).

#### *Variables captures access to resources*

Variables captures access to resources include household size, retirement saving goal. The x7001 in the SCF book was used to calculate the value of household size, it is a continuous variable and the descriptive analysis is used to seek for the mean number of people in each household. The retirement saving goal is a created indicator variable with 1 represents "yes" and 0 represents "no".

#### *Head's characteristic of employment*

Variables of Characteristic of employment include two variables: self-employment and poor health. Both of these variables are indicator variables.

#### *Head's demographic characteristics*

Variables of demographic characteristics include head's age, and in the multivariate analysis we included age squared to allow for nonlinear effects. Racial/ethnic group is categorized as white, black, Hispanic, and other. Education level categorized as less than high school, high school degree, some college, and Bachelor's degree, and post-bachelor's degree.

#### *Survey year*

As mentioned earlier, 1995, 1998, 2001, 2004, and 2007 SCF data sets were used in this study. Therefore, the survey year has 5 categories.

## **6. Results**

### *6.1 Descriptive Results*

The planned retirement age is increasing from 1995-2007. Figure 1 shows the trend of planned retirement age from 1995-2007. Planned retirement age increased from 61.8 in 1995 to 63.1 in 2007.

The weighted descriptive analysis results for independent variables are showed in Table 2. Compared with original article, there are some changes in terms of the mean percentage of several

independent variables. For example, the “retirement is a saving goal” has the mean percentage quite different from the 1995 study. The 1995 study reports that only 34.1% of the head consider retirement as a saving goal. However, this percentage increased to 61.15% in the replication. The change probably due to people’s enhanced financial literacy regarding the importance of saving for retirement. The percentage for “poor health” and “self-employment” are also very different when comparing the replication and the original study. Only 1% of respondents reported poor health in 1995 study but this percentage increased to 2.6% in the replication. As for the self-employment, only 10.8% of respondents report “self-employment” but this percentage increased to 17.89% in the replication. There is also a trend that people’s education level is getting higher compared with year 1995. More people possess college degree or post-graduate degree.

## 6.2 Regression Results

Table 1 shows the OLS regression results. More independent variables are significant than Montalto et al. (2000) reported. The planned retirement age prediction equation explains approximately 20% of the variance.

### 6.2.1 Demographic characteristics:

Demographic characteristics (including occupation, race, educational level, age and life expectancy) are generally significant. As Montalto et al. (2000) found, current age has a substantial effect. As current age increases from age 25, there is a very slight decrease to age 29, then planned retirement age increases substantially, as shown in Figure 2. At the mean value of other variables, planned retirement age increases from 60 at age 30 to almost 69 at age 65. Planned retirement age is affected by occupation. Four occupations are found to have significant effects relative to managerial/professional occupations: technician, service, operation and farming. As Montalto et al. (2000) found, older people intend to retire later. Households with white respondents had planned retirement ages higher than otherwise similar households with respondents of other racial/ethnic groups.

### 6.2.2 Financial variables:

The level of net worth significantly reduces the planned retirement age. The result is consistent with assumption 1 (higher level of net worth decreases planned retirement age). The natural log of net worth is a significant variable in predicting planned retirement age. Figure 3 shows the relationship between net worth and planned retirement age.

### 6.2.3 Variables captures access to resources

The household size and the retirement is a saving goal are both significant, especially the retirement is a saving goal. Holding all other things constant, those who deem retirement as a saving goal have planned retirement age 0.6 lower than those do not. The results are consistent with assumption 3 (increase access to resources reduce planned retirement age). The household size is also significant, larger household size increases the planned retirement age which is consistent with assumption 4.

### 6.2.3 Characteristic of employment variables:

The self-reported poor health factor is significant while the self-employment factor is not. Holding other things equal, those in poor health status have planned retirement age 0.34 lower than

those in good health status. Consistent with the result in the original article, being self-employed will not significantly affect the planned retirement age. The results are consistent with assumption 5 (poor health reduces planned retirement age). However, assumption 6 (self-employed increases planned retirement age) cannot be proved.

#### 6.2.4 Survey Year

All other things equal, heads in 2007 had a planned retirement age 0.6 years higher than those in 1995.

### 7. Summary and Conclusion

When compared the original findings with the replication, there are some changes worth to notice. The biggest changes happened in the “increase access to resources variables” and the “characteristics of employment variables”. In the replication, “the household size” and “the retirement is a saving goal” are both significant but in the original study they are not. “Poor health” factor is found to be significant in the replication but not the original study. The demographic characteristics are found to be all significant which is consistent with the original article. The education factors are found to be insignificant in original article while in the replication they are found to be somewhat significant especially for people possess bachelor degree or postgraduate degree.

### 8. Implication

There is a trend of increasing retirement age from 1995 to 2007. However, a longitude follow-up study might need to be conducted to confirm that the increasing planned retirement age is actually a trend. This is one of the implications for future studies. In addition, future studies could add more predictive independent variables in the equation.

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**Table 1**  
**Logistic Regression, Planned Retirement Age as a Function of Survey Year, Current Age, and Other Characteristics**

Descriptive statistics and ordinary least squares regression of planned retirement age	Mean or %	Parameter est	SE	P
Variable				
Planned retirement age (dependent variable)	62.36			
Intercept		65.30693	0.78878	0.0001
Financial variables/access to resources				
Log(net worth)	11.68	-0.2141	0.00788	0.0001
Household size	2.77	0.1008	0.0179	0.0001
Retirement is a saving goal	61.15%	-0.60248	0.04999	0.0001
Characteristics of employment				
Self-reports poor health	2.58%	-0.3421	0.05243	0.0001
Self employed	17.89%	-0.05716	0.057	0.2863
Occupation (reference category: Managerial and professional specialty)				
Technical, sales, administrative support	19.51%	0.46476	0.06868	0.0001
Service	9.14%	-0.84907	0.10528	0.0001
Precision production, craft and repair	15.58%	-0.02546	0.08641	0.7683
Operator, fabricators, and laborers	14.11%	0.18692	0.09203	0.0422
Farming, forestry, and fishing	1.35%	0.89281	0.19478	0.0001
Demographic characteristics and perceptions				
Head's life expectancy (year)	81.31	0.02902	0.00227	0.0001
Age of head	47.33	-0.39757	0.0306	0.0001
Age of head squared		0.00683	0.0003	0.0001
Respondent's race/ethnicity (reference category: White)				
Black	11.18%	-1.5805	0.09174	0.0001
Hispanic	6.77%	-0.77464	0.1118	0.0088
Asian and other races	4.1%	-0.6558	0.11764	0.0001
Education (reference category: less than high school graduates)				
High school graduate	24.79%	0.04952	0.14202	0.7273
Some college education	27.38%	0.11763	0.14298	0.4107
College graduate	23.59%	0.37219	0.14757	0.0117
Graduate degree	19.36%	0.68409	0.14999	0.0001
Survey year (reference category: 1995)				
1998	19.42%	-0.04865	0.07655	0.5251
2001	21.08%	0.10297	0.07496	0.1695
2004	20.44%	0.27958	0.07531	0.0002
2007	20.92%	0.60718	0.0754	0.0001

Figure 1

Planned Retirement Age by Survey Year

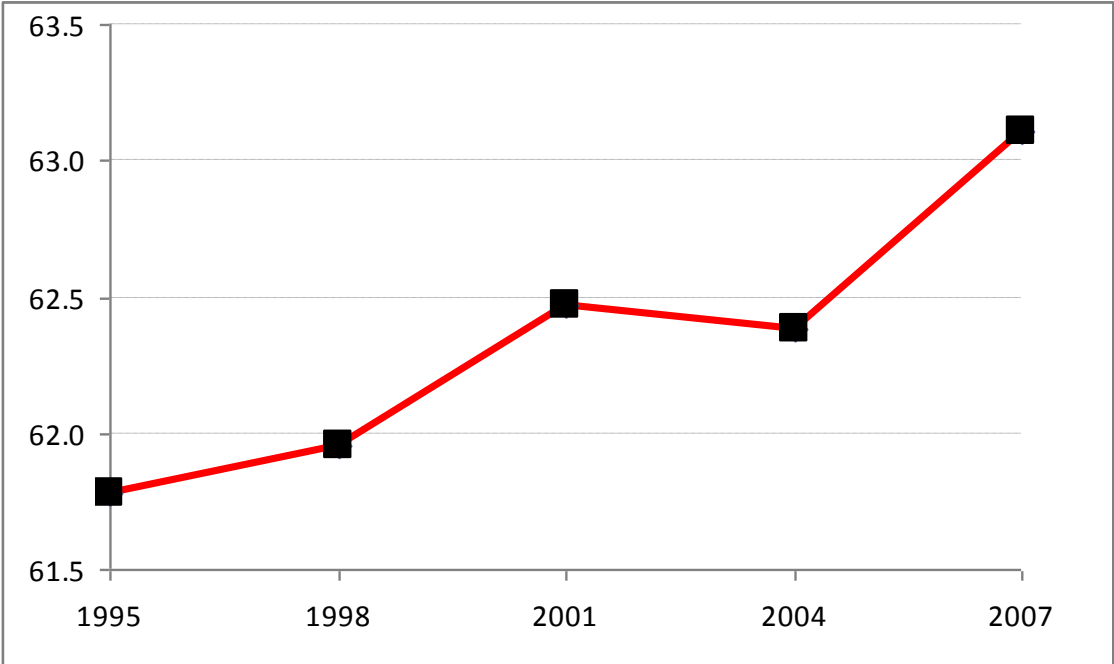
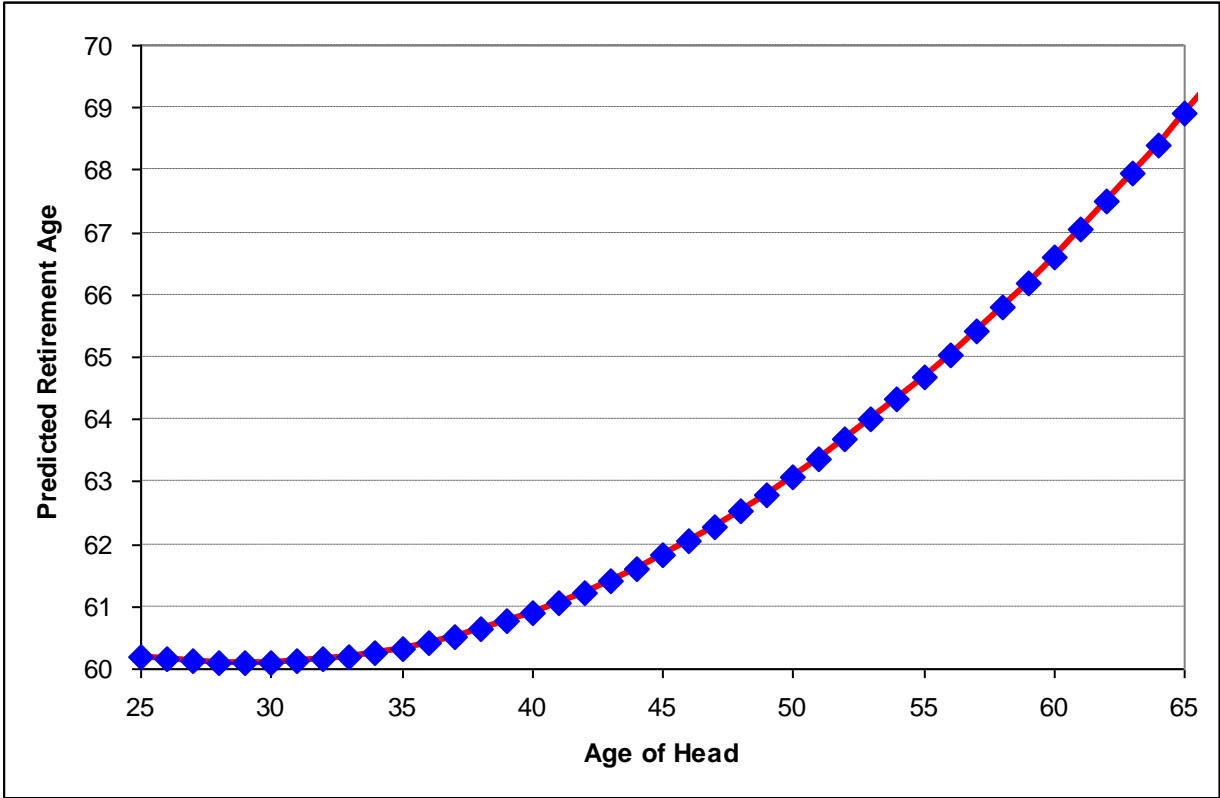
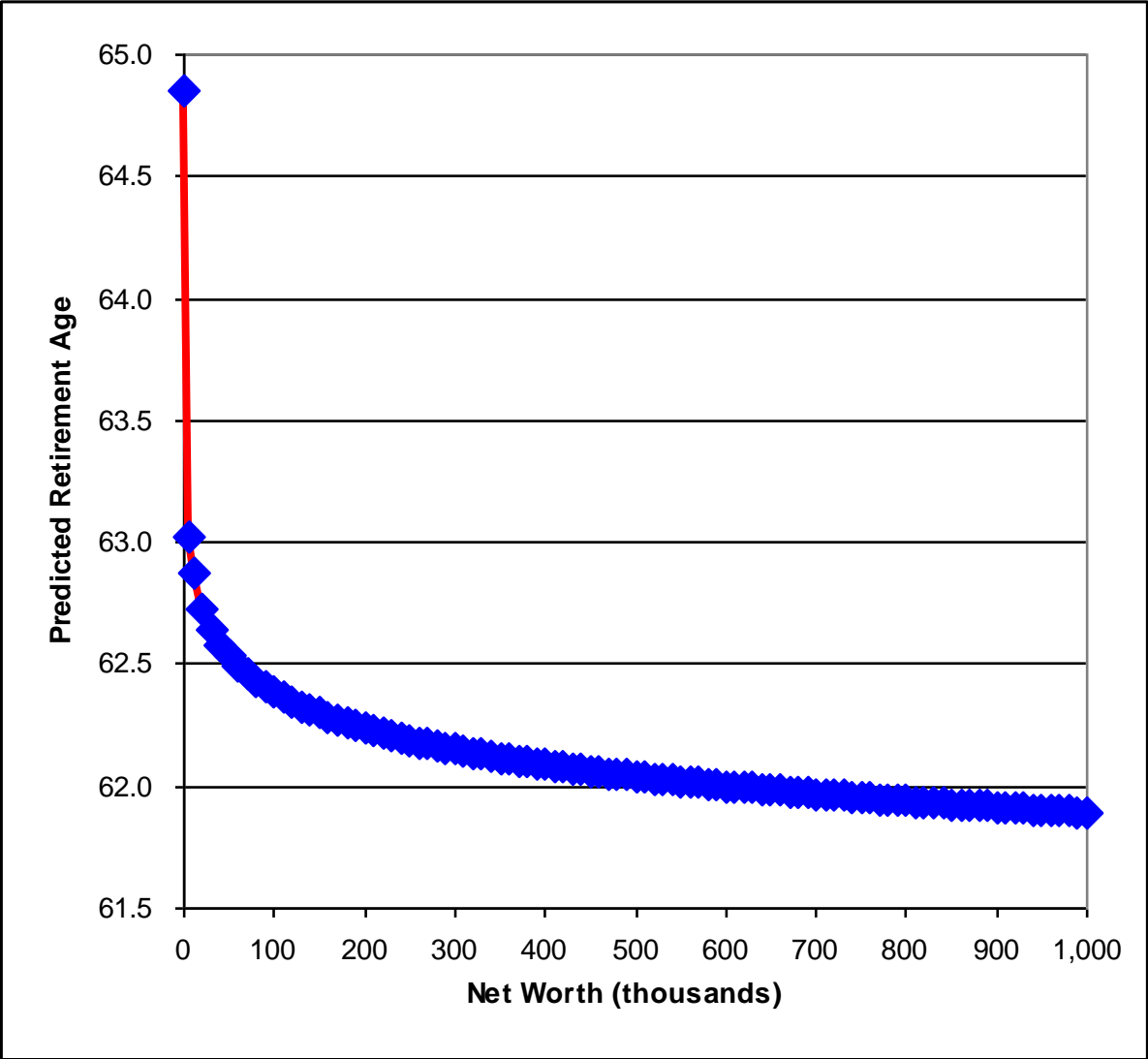


Figure 2  
Planned Retirement Age by Current Age



Combined effect of age and age squared, at mean values of other variables, based on regression results shown in Table 1

Figure 3  
Effect of Net Worth on Planned Retirement Age



Effect of net worth, at mean values of other variables, based on regression results shown in Table 1