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Wealth Effects and the Consumption of Leisure: Retirement Decisions During the Stock Market Boom of the 1990s

Julia Lynn Coronado
Federal Reserve Board
Washington, DC 20551
202-452-3044
jcoronado@frb.gov

Maria Perozek
Federal Reserve Board
Washington, DC 20551
202-452-3044
mperozek@frb.gov

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Abstract
It is well accepted that households increase consumption of goods and services in response to an unexpected increase in wealth. Consensus estimates of this wealth effect are in the range of 3 to 5 cents of additional consumption spending for each additional dollar of wealth. Economic theory also suggests that consumption of leisure, like consumption of goods and services, should increase with positive shocks to wealth. In this paper, we ask whether the run-up in equity prices during the 1990s led people to consume more leisure by retiring earlier than they had planned. We are able to identify the effect of unanticipated changes in wealth effect by exploiting unique expectations data in the Health and Retirement Survey (HRS). Our results suggest that households that held corporate equity immediately prior to the bull market of the 1990s were more likely to retire "early".

Introduction

Between 1990 and 1999 the S&P 500 stock index, one of the broader measures of stock values, appreciated an average of over 15 percent per year--more than twice its average in the previous 40 years. As shown in Figure 1, this rise in stock values was strongly correlated with a boom in the ratio of personal consumption expenditures to disposable income, and this correlation spawned a literature that sought to measure the impact of changes in wealth on consumption.[1]

Most analyses of the wealth effect have defined consumption narrowly as the consumption of goods and services and either ignored the consumption of leisure, or assumed no leisure response. Yet, under the assumption of an after-tax interest rate of 3 percent, consensus estimates of the wealth effect imply that people will not eventually consume all their wealth (Cheng and French, 2000). For this to make sense in a life cycle framework, individuals must either increase their leisure consumption or have strong bequest motives, or both.

In this paper, we ask whether the run-up in equity prices during the 1990s led people to increase their consumption of leisure by retiring earlier than they had planned. We focus on the retirement decision for three reasons; 1) much of the leisure response will likely accumulate and occur at retirement due to institutional inability to adjust leisure consumption at the margin, 2) those nearing retirement age in the early 1990s were close to their peak net worth when the stock boom occurred and likely benefited from it the most, and 3) we can take advantage of a unique data set that enables us to identify the wealth effect on retirement.

[1] Poterba (2000) provides a useful survey of the literature on wealth effects. More recent examples include Dynan and Maki (2001) and Maki and Palumbo (2001).

Understanding the relationship between wealth shocks and retirement may be just as important as estimating the wealth effect on the consumption of goods and services. For example, in a booming economy with a booming stock market, tight labor market conditions might be exacerbated by the reduced labor supply of stockholders, further fueling inflationary wage pressures. In addition, the effect of wealth shocks on retirement is relevant for many of the critical retirement security issues being debated today, especially in light of the shift toward defined contribution pension plans and recent proposals to add individual accounts to the social security system.

Previous Literature

Our paper contributes to a small but growing literature on the effects of wealth on retirement decisions.[2] Earlier work tends to focus on the effects of inheritances and lottery winnings as sources of unanticipated wealth shocks. For example, Holtz-Eakin, Joulfaian and Rosen (1993) provide evidence that large inheritances reduce the labor supply of recipients.[3] Although inheritances may or may not constitute unexpected increases in wealth, the negative effects on labor supply suggest that at least part of the inheritance was unexpected. In addition, Imbens, Rubin and Sacerdote (1999) find that winners of large lottery prizes show a significant reduction in labor force participation as well as labor supply measured in hours.

More recently, the literature has focused on the effect of the 1990s stock market boom on labor force participation. Cheng and French (2000) estimate that the stock

[2] There is a large literature on other aspects of retirement behavior, particularly on the effects of pensions on retirement. For example, see Gustman and Steinmeier (1986), Stock and Wise (1990), Rust and Phelan (1997), Samwick (1998), Coile and Gruber (2000), and Chan and Stevens (2001).

[3] Joulfaian and Wilhelm (1994) find only modest negative disincentive effects of inheritances on labor supply.

market run-up of the 1990s reduced male labor force participation rates by between 1 percent and 3-1/4 percent, on average, between 1995 and 1999. Sevak (2001) finds that early retirement rates for workers with DC pension plans rose relative to the early retirement rates of other workers, which remained stable between 1992 and 1998. Taken together, these findings suggest that positive wealth shocks can reduce labor supply.

A Life-Cycle Model of Retirement Behavior

This section presents a simple life-cycle framework for thinking about retirement behavior in the presence of uncertainty about future economic status as well as family and individual characteristics such as health and marital status. Life-cycle models predict that individuals will work and accumulate assets while young and middle-aged, and retire and draw down assets when old. If there is no uncertainty in the world, life-cycle consumers will never find it optimal to deviate from the retirement age and consumption path chosen at the beginning of their lives.

In reality, consumers face uncertainty regarding the outcomes of economic variables such as future income and investment returns, as well as family and individual characteristics such as health status and marital status. Individuals must make retirement plans and consumption decisions based on what they know about the likelihood of future realizations of uncertain variables given all information available at the time. For simplicity we assume that consumers are exposed to two types of uncertainty: uncertainty in investment returns (r_t) and uncertainty about certain components of household status (Z_t), including marital status and the health status of family members. We assume that individuals understand the laws of probability that govern the distribution of future

investment returns and household status variables conditional on all available information. Individuals choose their retirement age R and consumption path $\{c_t\}_{t=t_0}^{T}$ to maximize expected lifetime utility, which is a function of consumption in each period (c_t), leisure in each period, (l_t), and a vector of household and individual characteristics Z_t:

$$(1) \qquad \underset{R,\, s_t}{Max} \quad E_{t_0}\sum_{t=t_0}^{R-1}\beta^{t-t_0}U(c_t, l_t, Z_t) + \quad E_{t_0}\sum_{t=R}^{T}\beta^{t-t_0}U(c_t, l_t\ Z_t)$$

where $c_t = (1+r_t)W_{t-1} + y_t - s_t$

and $y_t = \begin{cases} w_t & if\ t < R \\ B_t & if\ t \geq R \end{cases}$

and $W_T \geq 0$

where T is the fixed length of life, β is the discount factor, y_t is family income, s_t is saving, W_t is wealth, and r_t is the return on wealth, which is broadly defined to include interest and dividend income as well as capital gains on existing assets.

At time t_0, the worker takes into account all of the information available and estimates the age of retirement and consumption path that maximize his expected lifetime utility. The expected retirement age at time t_0, $R_{t_0}^{E}$, is a function of the state variables at time t_0 $(W_{t_0},\ r_{t_0},\ y_{t_0},\ Z_{t_0})$ as well as other information available at time t_0 (I_{t_0}):

$$(2) \qquad R_{t_0}^{E} = f(W_{t_0},\ r_{t_0},\ y_{t_0},\ Z_{t_0},\ I_{t_0})$$

As time goes by, some uncertainty about health status, family composition, and investment returns is resolved. For example, after Δ years--at time $t_0+\Delta$--the consumer will have observed the realizations of health status, family composition, and investment returns over that period. To the extent that these realizations differ from expectations at time t_0, workers will update their expectations about retirement age and consumption path by re-optimizing given the realizations of health status, family composition, and investment returns between time t_0 and time $t_0+\Delta$. Accordingly, the updated expected retirement age at time $t_0+\Delta$ is given by:

$$(3) \qquad R^{E}_{t_0+\Delta} = f(W_{t_0+\Delta}, r_{t_0+\Delta}, y_{t_0+\Delta}, Z_{t_0+\Delta}, I_{t_0+\Delta})$$

Revisions to retirement expectations occur over time as uncertainty is resolved, leading to current conditions that differ from previous expectations and altering expectations about future states. Formally, changes in expected retirement dates between time t_0 and time $t_0+\Delta$ can be written as the difference:

$$(4) \qquad R^{E}_{t_0+\Delta} - R^{E}_{t_0} = f(W_{t_0+\Delta}, r_{t_0+\Delta}, y_{t_0+\Delta}, Z_{t_0+\Delta}, I_{t_0+\Delta}) - f(W_{t_0}, r_{t_0}, y_{t_0}, Z_{t_0}, I_{t_0})$$

or

$$(4') \quad R^{E}_{t_0+\Delta} - R^{E}_{t_0} = (W_{t_0+\Delta} - W_{t_0}, r_{t_0+\Delta} - r_{t_0}, y_{t_0+\Delta} - y_{t_0}, Z_{t_0+\Delta} - Z_{t_0}, I_{t_0+\Delta} - I_{t_0}, W_{t_0}, r_{t_0}, y_{t_0}, Z_{t_0}, I_{t_0})$$

In our simplified presentation, deviations in retirement decisions or expectations from what was planned at time t_0 will be a function of realizations of health status, family composition, and investment returns that differ from what was anticipated at time t_0.

Identifying the Effects of Wealth Shocks on Retirement Decisions

In the context of the life cycle framework described above, the level of wealth and the decision to retire will be simultaneously determined. Individuals that have strong preferences for leisure may opt to save more and accumulate more wealth while young in order to facilitate earlier retirement from the labor force. Therefore, identifying the effect of wealth on retirement decisions is fraught with difficulties, even when panel data are available.

This paper identifies the effect of wealth shocks on retirement decisions by exploiting unique data available from the Health and Retirement Study (HRS) on retirement expectations just prior to the period of extraordinary, and arguably unanticipated, stock market returns in the 1990s. The HRS is a panel data set that provides detailed information on the health status, economics status and work histories of a nationally representative cohort that was aged 51-61 in 1992. These individuals are then re-interviewed every two years. We use data from the first four waves of the HRS (1992, 1994, 1996 and 1998), which allows us to capture the bulk of the stock market run-up of the 1990s. We select a sample of respondents who are in the labor force at the initial interview in 1992.

The key to identifying the wealth effect lies in our ability to measure retirement expectations at the initial interview in 1992. Respondents who were in the labor force

were asked to estimate the date at which they expected to retire completely. In theory, if expectations are rational, survey respondents should use all relevant information available to them in 1992 to form expectations about their retirement date.[4] Relevant information likely includes the level and composition of wealth in 1992, family income in 1992, expected retirement benefits conditional on age of retirement, the availability of employer-provided health insurance and retiree health insurance, and family and individual characteristics such as health status, marital status and family size.

Our empirical test for the wealth effect on retirement assumes that retirement expectations are rational in the sense that they reflect relevant information available at the 1992 baseline interview, as well as subjective probability distributions of events, such as health shocks, that might influence labor force decisions. While there has been a fair amount of work on the validity of the expectations data in the HRS, most of this work has focused on mortality expectations and other expectations variables rather than retirement expectations.[5] A notable exception is work by Douglas Bernheim (1989) that uses data from the Retirement History Survey (RHS) to examine the accuracy of retirement expectations of retirement-aged households from 1969-1975. Bernheim finds that consumers form reasonably accurate expectations about retirement, but that the accuracy of these expectations tends to vary by gender, marital status and wealth. However, Bernheim does not consider the effects of uncertainty in health status or investment returns on deviations from expected retirement dates. It is likely that shocks to both health and wealth affect behavior differently by gender, marital status and wealth.

[4] For instance, workers in poor health may foresee further health problems in the future, and consequently plan to retire earlier than workers who are in better health. Alternatively, the value of leisure might be greater for someone in better health, leading them to retire earlier. The question of which effect dominates is an empirical one. In any case, the health status at baseline will be factored into retirement.
[5] See Hurd and McGarry (1995, 1997), Bassett and Lumsdaine (1999, 2001)

As we follow people through time, we can observe whether individuals retired earlier or later than expected. The top panel of figure 2 shows the expected retirement age of our sample members. The vast majority of the sample expects to retire between the ages of 60 and 67, with spikes at 62 and 65.[6] Approximately 35 percent of our sample retires before the fourth wave, and their age at retirement is plotted in the middle panel.[7] The bottom panel shows how actual retirement ages differ from the expected retirement age in our sample. In the chart, deviations are calculated as the actual age of retirement minus the expected age, so if an individual retired earlier than expected their deviation will be negative. More than a third of those who retired did so earlier than expected, somewhat less than a third did so as expected, and about a third did so after expected. However, there is much more dispersion in deviations among those who retired early. We will discuss further the skewness of the distribution in deviations from retirement expectations when we present our econometric specification.

If actual retirement dates deviate from expectations, we can explore whether these deviations are related to changes in the fundamental economic and family/individual characteristics on which expectations were based in 1992. The largely unanticipated stock market returns in the 1990s suggest that respondents holding stock in the early waves, either directly or indirectly through mutual funds or defined contribution pension plans, would realize unexpectedly large capital gains on their stock portfolio. The positive shock to the wealth of stockholders might induce some of these individuals to retire earlier than they expected at the 1992 baseline interview.

[6] We include spouses of age eligible respondents in our sample, some of whom are younger than 51 and may expect to retire at relatively young ages.

[7] We measure retirement age using the retirement status variable in each wave, so an individual who retired in 1993 at age 62 will be measured as retiring at age 63 in 1994. This leads to greater dispersion in the actual retirement age.

Table 1 shows some descriptive statistics that suggest that increases in stock market wealth are correlated with decisions to retire earlier than expected. The table categorizes individuals according to their retirement status in 1998 (wave 4 of the HRS). Those retired are further categorized according to whether they retired later than expected, as expected, or earlier than expected. Given the stock market boom of the 1990s, we might expect early retirees to be more likely to hold stock and to have received larger gains on their stock holdings than other retirees and non-retired respondents. Lines 4 through 7 of the table show that, while those who retired early were not more likely to hold stock in 1992, they report much larger gains in the value of their stock portfolio and overall net worth than other groups. Indeed, the change in the value of stocks held by early retirees averaged about $93,000--significantly higher than the average of about $58,000 for the total sample. These results suggest that increases in stock market wealth are associated with early exits from the labor force.

Several indicators of health shocks are also included in the table. Sample members who did not retire were in better initial health, and were far less likely to experience a health shock before 1998. Among retirees, however, health shocks and shocks to spouse's health were actually more likely among those who retired late than those who retired early. Early retirees were in poorer initial health, however, and therefore were possibly more adversely affected by health shocks than other retirees.

These descriptive results suggest that there may be important relationships between shocks to health and wealth and decisions to retire earlier than expected. However, in order to identify the effects of wealth and health shocks on deviations from

retirement expectations, it is necessary to control for other relevant variables in a regression framework.

Econometric Specification

We want to identify the factors that lead individuals to make retirement decisions that differ from expectations formed in 1992. According to equation (4′), the factors that lead to revisions in retirement expectations are realizations of variables that are not known with certainty such as investment returns, health conditions, and family structure that differ from a priori expectations. While we observe retirement expectations in the first wave of the HRS, individuals are not asked when they expect to retire in subsequent waves, and we will therefore not observe revisions to retirement expectations. If sample members retire prior to the fourth wave, however, we observe their actual retirement date and can calculate how much their actual retirement date differs what they expected in 1992. We therefore estimate the following equation:

$$(5) \qquad R_{ti} - R^{E}_{1992,i} = \beta_0 + \beta_1(W_{ti} - W_{1992,i}) + \beta_2'(Z_{ti} - Z_{1992,i}) + \beta_3 W_{1992,i} + \beta_4 Z_{1992,i} + \varepsilon_i$$

Retirement behavior that deviates from expectations is a function of unanticipated changes in wealth, health status, and household composition, as well as baseline values for these variables. Although expectations in 1992 should reflect the baseline values for wealth and other characteristics, they are included in the specification for two reasons. First, the accuracy of expectations may differ systematically by baseline characteristics. For example, Bernheim (1989) finds evidence that men form more accurate retirement

expectations than women, and that married women, in particular, tend to underestimate how long they need to work. Second, health shocks may affect people differently depending on their baseline characteristics. For example, a person in poor health may be more likely to leave the labor force following a health shock than a worker who was in excellent health at the initial interview.

Several issues arise in estimating this relationship. First, theory predicts that only unanticipated changes in relevant socio-economic variables should alter expectations about retirement. However, in reality, we can only measure changes in the relevant variable; we cannot decompose those changes into anticipated changes and unanticipated changes. For example, if all changes in wealth were anticipated, then the estimate of the coefficient β_1 should be zero. Therefore, a significant coefficient estimate on β_1 indicates that at least part of the change in wealth was unexpected, although the measurement of the actual effect of unanticipated wealth changes will be biased toward zero.

Second, we can only calculate deviations from retirement expectations for sample members who retired before wave 4. Some of those who did not retire by 1998 expected to do so and we therefore know that they will retire after they expected but we don't know by how many years. Others did not expect to retire by 1998, and they may retire after expected, as expected, or before expected. We observe only that their behavior has not yet deviated from expectations. We treat individuals who have not yet retired as censored observations and estimate equation (5) using a generalized tobit specification that allows for censoring at different values of the dependent variable. Deviations from retirement expectations for individuals who expected to retire by 1998 and did not are

calculated as the expected retirement date minus 1998, or the deviation observed to date. For those who did not expect to retire by 1998 and did not, their deviation to date is zero.

Another issue in estimating equation (5) is that it would be incorrect to assume that the error term has a constant variance. In addition to the observable characteristics that we control for, it seems reasonable to assume that deviations from retirement expectations will vary with the planning horizon. The closer to retirement, the more time and effort an individual is likely to put into forming an expectation and therefore the smaller the variance in error is likely to be. We therefore allow the variance of the error term to vary with the number of years remaining until the expected retirement date.

Results

Equation (5) was estimated using maximum likelihood procedures that took into account the censoring of respondents who had not retired by wave 4. The dependent variable measures deviations from retirement expectations, and the independent variables have been grouped into three categories: changes in net worth, changes in family and health status, and baseline characteristics. The results are presented in table 2 for the total sample, and then separately for women and men. The coefficient estimates from the first regression, which was estimated pooling all sample members, are shown in the first column, and standard errors are shown in the second column. The coefficient estimates can be interpreted as the number of years the respondent retired before or after expected, with a negative coefficient indicating the number of years they retired before expected, and a positive coefficient indicating the number of years they retired after expected. Note, however, that due to the nonlinearity of the censored normal regression, coefficient

estimates cannot be interpreted as the marginal effect on the labor force participation of all respondents.

As discussed above, it is difficult to disentangle expected changes in wealth from true "shocks" to wealth. We assume that the persistent double-digit returns on equity in the 1990s were unanticipated and therefore constitute a shock to wealth that will only have been realized by stockholders. We measure this effect with two variables; one is a dummy variable indicating any stock ownership in wave 1, and the second is the change in the value of the family's stock portfolio between wave 1 and wave 4. As shown in the first two rows of table 2, stock ownership and the change in the value of stock held by respondents are both associated with significant negative deviations from retirement expectations. That is, those holding stock in the first wave were more likely to retire earlier than expected relative to those who did not hold stock in the first wave. This result appears to be both statistically and economically significant: Among retirees, those holding stock retired about 9 months earlier than expected relative to other retirees, and even earlier if the increase in the value of their stock portfolio was large. Interestingly, the estimated effect of stock ownership on deviations from retirement expectations is somewhat stronger for women than for men, although the difference does not appear to be statistically significant. Other changes in economic status, such as changes in the value of net worth excluding stock and receiving retirement incentives from an employer do not appear to have significant effects on deviations from retirement expectations, perhaps indicating that these changes were anticipated and incorporated into expectations in 1992.

The second panel of table 2 shows the effects of health shocks and changes in marital status on deviations from retirement expectations. The results indicate that respondents who were married or divorced between wave 1 and wave 4 worked longer than expected relative to those whose marital status was unchanged. However, this effect is only statistically significant for men: Among men who retired between 1992 and 1998, those who were married or divorced during that time worked 2 years longer than expected at the baseline.

Health shocks also appear to play an important role in early retirement, although the effects of these shocks vary significantly by gender.[8] For example, for the total sample, the effect of being diagnosed for the first time with cancer, heart disease or stroke (health shock--type 1) is negligible. However, women who received such a diagnosis were more likely to work longer than expected, while men who received the diagnosis were more likely to retire earlier than expected. In contrast, receiving a repeat diagnosis of heart disease or cancer has a significant and negative effect on labor force participation in the total sample; however, this effect is not significant for men.

We have abstracted from the joint decision making process that likely influences expected and actual retirement dates for couples and treated changes in spouses' economic status and health as exogenous. The results indicate that a spouse's decision to retire can induce earlier than expected retirement for both men and women. While the variables indicating that a spouse received a health shock are not significant in the sample overall, men and women appear to react very differently when their spouse falls ill. Women tend to retire earlier than expected if their spouse receives a health shock of any

[8] See Dwyer and Mitchell (1999) for a more thorough exploration of the role of health shocks on retirement.

type or experiences deterioration in his health status, while men do not appear to alter their retirement plans, except to increase work relative to expectations if a spouse falls ill. This might make sense if women are more likely to be secondary workers, and therefore, more likely to drop out of the labor force to take care of a sick spouse. In addition, it is possible that women are more likely to receive employer-provided health insurance through their spouse, and therefore, a women's illness may necessitate that her husband work longer than expected to be covered by health insurance.

As noted above, we assume that expectations reflect all relevant information available in 1992, such as the baseline characteristics included in the regression. However, these variables may be significant determinants of deviations from retirement if the accuracy of expectations varies by subgroup, or if baseline characteristics interact with shocks to health or wealth in systematic ways. For example, respondents who are married in wave 1 may react to wealth or health shocks differently because of the presence of their spouse, who may help to buffer against shocks. Alternatively, spouses can be a source of shocks to the family, e.g. health shocks, and require a reduction or increase in labor supply by the other member of the couple. In fact, the regression results suggest that married respondents worked longer than expected relative to never married respondents, although the effect is only statistically significant for women. In fact, marital status appears to have quite different effects by gender. For example, women who were widows in the first wave work significantly longer that expected, whereas men who were widowers retired significantly earlier than expected.

Some of the other baseline characteristics also appear to be important determinants of deviations from retirement expectations. In particular, the availability of

employer provided health insurance (without retiree health insurance) is associated with working significantly longer than expected, possibly reflecting the need to continue working in order to receive health insurance if a health shock occurs. On the other hand, if a respondent has retiree health insurance, then the respondent is no more or less likely to deviate from expectations than a respondent with no employer-provided health insurance. Initial health status also appears to be important; those reporting fair health were likely to retire earlier than expected relative to those in good or better health at the initial interview. This result may indicate an increased vulnerability to health shocks for those in fair health relative to those in better health. Greater levels of educational attainment are also associated with working longer than expected.

Conclusion

The results of our analysis suggest that the bull market of the 1990s led to a wealth effect on the consumption of leisure. In particular, among retirees, those who held stock in 1992 were more likely to retire earlier than they had planned. Further, larger increases in stock values are associated with earlier retirements relative to expectations.

Given the recent declines in stock prices, we might expect workers with exposure to the stock market to have postponed their retirement. As defined contribution pension plans become a more dominant part of household portfolios, our results indicate that labor force participation may be increasingly tied to fluctuations in asset prices.

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Table 1 - Baseline Conditions and Shock Measures by Retirement Status

		Timing of retirement			
	Not retired	After expected	As expected	Before expected	Total sample
Age	53.74 (0.0727)	58.77 (0.1810)	58.11 (0.1404)	55.34 (0.1415)	54.82 (0.0628)
Male	0.46 (0.0096)	0.51 (0.0324)	0.57 (0.0222)	0.40 (0.0184)	0.47 (0.0077)
Years to expected retirement in wave 1	9.945 (0.0878)	2.385 (0.0697)	3.531 (0.0755)	8.366 (0.1460)	8.474 (0.0745)
Net worth in wave 1	185,994 (8,313)	212,019 (20,675)	185,099 (11,815)	186,569 (13,985)	187,483 (6,205)
Held stock	0.5104 (0.0096)	0.5781 (0.0321)	0.5854 (0.0222)	0.5144 (0.0190)	0.5239 (0.0078)
Value of growth in stock holdings between wave1 and wave 4	49,051 (6,535)	48,607 (10,818)	59,182 (9,336)	93,438 (22,733)	57,777 (5,898)
Growth in net worth	112,683 (19,592)	87,809 (19,704)	100,016 (12,542)	155,131 (30,228)	116,944 (13,911)
Received retirement incentive from employer	0.10 (0.01)	0.13 (0.02)	0.19 (0.02)	0.16 (0.01)	0.12 (0.01)
Married in wave 1	0.80 (0.01)	0.79 (0.03)	0.83 (0.02)	0.79 (0.02)	0.80 (0.01)
Working spouse	0.62 (0.01)	0.56 (0.03)	0.58 (0.02)	0.57 (0.02)	0.60 (0.01)
College degree or higher	0.22 (0.01)	0.23 (0.03)	0.22 (0.02)	0.17 (0.01)	0.21 (0.01)
Self-employed	0.16 (0.01)	0.10 (0.02)	0.09 (0.01)	0.12 (0.01)	0.14 (0.01)
Ranked own health as good or better in wave 1	0.91 0.01)	0.82 0.02)	0.87 (0.02)	0.76 0.01)	0.88 0.01)
Spouse retired before wave 4	0.15 (0.01)	0.31 (0.03)	0.35 (0.02)	0.25 (0.02)	0.20 (0.01)
Had serious health shock before wave 4	0.19 (0.01)	0.36 (0.03)	0.33 (0.02)	0.29 (0.02)	0.23 (0.01)
Spouse had serious health shock before wave 4	0.20 (0.01)	0.27 (0.03)	0.22 (0.02)	0.21 (0.02)	0.21 (0.02)
Number of individuals	2,710	239	497	705	4151

Table 2 – Determinants of Retirement Decisions that Differ from Expectations

	Total Sample		Women		Men	
Variables	β	σ	β	σ	β	σ
Changes in economic status:						
Owned stock in wave 1	-0.729**	0.149	-0.835**	0.225	-0.666**	0.204
Growth in value of stock (thousands)	-0.001**	0.000	-0.001**	0.000	-0.000	0.000
Change in other net worth	-0.000	0.000	-0.000	0.000	0.000	0.000
Employer offered retirement incentive	-0.120	0.186	0.020	0.261	-0.024	0.264
Changes in family and health status:						
Widowed	-0.322	0.448	-1.211**	0.481	0.351	0.965
Divorced	1.845**	0.671	2.552	2.053	2.017**	0.762
Married	0.969**	0.462	0.916	0.596	2.071**	0.796
Health improved	-0.575**	0.153	-0.920**	0.200	-0.240	0.232
Health deteriorated	-0.487**	0.149	-0.721**	0.201	-0.386*	0.211
Health Shock-type1	0.009	0.154	0.685**	0.209	-0.444**	0.218
Health shock-type2	-0.725**	0.269	-1.396**	0.419	-0.392	0.363
Spouse retired	-1.233**	0.181	-1.491**	0.267	-1.015**	0.245
Spouse had type 1 health shock	-0.186	0.173	-0.437**	0.226	0.007	0.257
Spouse had type 2 health shock	-0.341	0.326	-0.806*	0.470	0.033	0.459
Spouse's health deteriorated	0.082	0.155	-0.593**	0.216	0.634**	0.216
Baseline Conditions:						
Male	0.182	0.142				
Age <51	3.756**	0.696	3.128**	0.712	7.815**	2.327
Age >51 and <61	0.363**	0.184	0.859	0.391	0.617**	0.225
Expected to retire before 1998	-4.602**	0.489	-2.852**	0.566	-6.630**	0.782
Retirement horizon	0.189**	0.051	0.118*	0.062	0.162**	0.078
Self-employed	0.683**	0.237	-0.429	0.310	1.250**	0.357
Net worth wave 1	0.000	0.000	0.000	0.000	0.000	0.000
Employer health insurance	0.704**	0.254	0.225	0.315	0.662*	0.387
Retiree health insurance	-0.678**	0.196	-0.457*	0.251	-0.467	0.291
Excellent health	0.435**	0.193	1.205**	0.246	-0.273	0.293
Very good health	0.149	0.166	0.349	0.229	0.136	0.238
Fair health	-0.637**	0.219	-0.566*	0.295	-0.861**	0.319
Poor health	0.256	0.359	-0.127	0.498	0.142	0.503
Had working spouse	0.927**	0.190	0.881**	0.284	0.854**	0.261
Married	1.000**	0.439	2.073**	0.553	0.464	0.678
Divorced or separated	0.957**	0.463	2.074**	0.555	-0.321	0.773
Widowed	1.353**	0.486	2.369**	0.555	-1.565*	0.922
High-school graduate	0.438**	0.177	-0.076	0.259	0.726**	0.248
Some college	0.579**	0.230	0.497	0.311	0.526	0.346
College graduate	0.350	0.268	-1.367**	0.393	1.042**	0.361
Graduate education	0.437*	0.241	0.048	0.336	0.368	0.344
Constant	5.353**	0.751	3.946**	0.913	7.463**	1.164
Number of observations		4104		2181		1923
Censored observations		2685		1435		1250

Figure 1 - S&P 500 Index vs. Ratio of Personal Consumption Expenditures to Disposable Personal Income

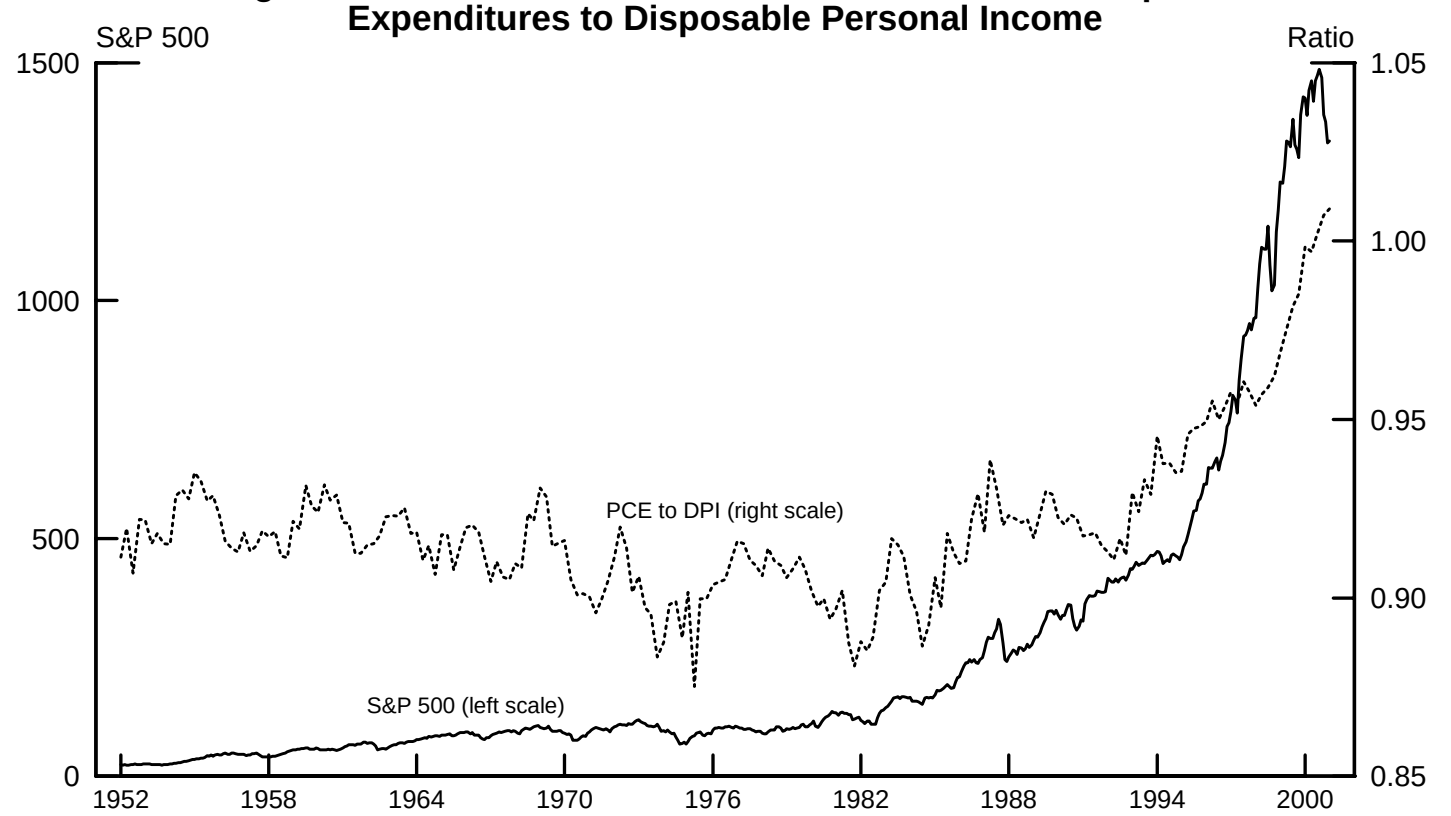

Figure 2 - Retirement Expectations and Realizations in the HRS