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Back to Work

Expectations and Realizations of Work after Retirement

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LABOR AND POPULATION

BACK TO WORK: EXPECTATIONS AND REALIZATIONS OF WORK AFTER RETIREMENT

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Abstract

This paper analyzes a puzzling aspect of retirement behavior known as "unretirement," in which retirees appear to reverse their retirement decisions and return to work. Using panel data from the Health and Retirement Study, I show that nearly 50 percent of retirees follow a nontraditional retirement path that involves partial retirement or unretirement, and that 26 percent of retirees later unretire. I explore two possible explanations: 1) unretirement transitions are unexpected, resulting from failures in planning or financial shocks; and 2) unretirement transitions are anticipated prior to retirement, reflecting a more complex retirement process. I present a theoretical model that illustrates how both unplanned and planned unretirement might arise in a life-cycle framework—the former via uncertainty in asset returns and medical expenses, and the latter through a phenomenon I call "burnout and recovery," in which individuals systematically burn out on their career jobs, retire, then return to the labor force after a period of recovery. Using data on expectations and realizations of work during retirement, I show that unretirement was anticipated for the vast majority (82 percent) of those returning to work, and is not a result of financial shocks, poor planning or low wealth accumulation. For the small minority who unexpectedly returned to work, the evidence points to preference shocks—that is, discovering retirement leisure less satisfying than expected. If anything, expectations err on the side of excessive pessimism about retirement rather than unwarranted optimism; this finding complements a growing literature on consumption behavior at retirement which has suggested that realized retirement turns out better than expected for most people.

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1. Introduction

Retirement marks a sharp reduction or cessation of lifetime work effort. Yet, a curious fact about retirement behavior is that many people later reverse their retirement decision and return to work. Many have speculated that economic shocks are a likely cause. Indeed, rates of return on many financial assets are uncertain, health care expenses may increase unexpectedly, and no one knows the evolution of his health or life span. Information shocks are also possible, if after retiring some individuals learn they did not save enough[1] or discover they do not like retirement as much as anticipated. An alternative explanation is that "unretirement" transitions are planned. For example, Diamond and Hausman (1984) note that the social security earnings test could generate planned unretirement, at least in theory. More generally, unretirement could be part of a multi-stage retirement process; an intentional way of transitioning gradually out of the labor force, much like partial retirement.

The welfare implications of these two explanations are quite different, and the retirement literature offers little guidance as to which is the more likely reason. Even though unretirement could be optimal in a theoretical life cycle model, whether on account of uncertainty or some predictable force, many empirical analyses assume retirement is an absorbing state. Of those that relax this assumption (e.g., Berkovec and Stern, 1991, Blau, 1994, French, 2005, Rust and Phelan, 1997), only Blau (1994) and Rust and Phelan (1997) examine whether their models can predict observed re-entry rates. Although many authors have noted the existence of so-called reverse transitions in the data, rarely has unretirement been the object of direct study, perhaps because unretirement transitions were often thought to be relatively infrequent (see e.g., Reimers and Honig, 1993, Rust and Phelan, 1997).

[1] A growing literature has examined whether such shocks can explain the seemingly "irrational" drops in consumption spending after retirement known as the retirement-consumption puzzle (Banks et al., 1998, Haider and Stephens, 2004, Hurd and Rohwedder, 2003, Smith, 2004).

In this paper, I show that unretirement transitions are not infrequent. In the Health and Retirement Study (HRS), 26 percent of retirees reverse their retirement decision, and as many as 35 percent of the youngest retirees do so. To help interpret these data, I offer a simple life cycle model of retirement that generates optimal unretirement by two mechanisms: 1) uncertainty in asset returns, healthcare expenses, and wage offers; and 2) a phenomenon I call "burnout and recovery" in which individuals predictably "burn out" on work, retire, and "recover." I use this framework to guide a set of reduced form analyses designed to test whether unretirement transitions were mostly expected or unexpected as of the period *before* retirement.

Drawing on unique expectations data in the HRS, I show that 82 percent of those later observed to unretire expected to work during retirement. I reinforce this finding by showing that information known prior to retirement predicts subsequent unretirement nearly as well as ex-ante and ex-post information combined. For the small minority of unretirees who deviated from their pre-retirement expectation of not working, there is little evidence that financial shocks played a significant role. If anything, my results point to preference shocks—some individuals apparently found retirement less satisfying than anticipated. Perhaps surprisingly, unfulfilled work expectations were much more common than unfulfilled leisure expectations. In this regard, the evidence points to two causal factors: the arrival of *positive* news about financial position at retirement for some and the arrival of negative news about health (i.e., health shocks) for others.

Finally, I show that unretirement is quite similar to partial retirement both in terms of the jobs held and the characteristics of the individuals who choose these non-traditional retirement paths. The prevalence of unretirement, as well as partial retirement, underscores the rising importance of multi-stage retirement transitions. I offer the burnout/recovery hypothesis as a starting point for allowing unretirement transitions to arise not only through uncertain

realizations of the budget constraint in structural life cycle models, but also through dynamic preferences for leisure.

2. The Empirical Importance of Unretirement

2.1 Definitions of Retirement and Unretirement

I define the states of full and partial retirement on the basis of hours worked. I then refine these classifications using self-assessed retirement status in order to distinguish the unemployed and disabled from the retired, and part-time workers from the partially retired. [2] Specifically, an individual is classified as *fully retired* if 1) he reports not working for pay; and 2) he describes himself as retired. If he makes no mention of retirement, he is considered unemployed, disabled or not in the labor force. An individual is classified as *partially retired* if 1) she reports working for pay; 2) she works part-time (defined as working fewer than 35 hours per week or fewer than 36 weeks per year); and 3) she describes herself as retired. If she makes no mention of retirement, then she is classified as working part-time, rather than partially retired. Unretirement is defined as any of three possible transitions: 1) full retirement to full-time employment; 2) full retirement to partial retirement/part-time employment; and 3) partial retirement to full-time employment. It is also useful to distinguish partial retirement transitions which here refer to direct transitions from full-time work to partial retirement. Transitions are identified on the basis of wave-to-wave changes in labor force status, and the associated transition dates reported by respondents are carefully recorded.[3] The Data Appendix discusses additional issues associated

[2] For example, only 64 percent of those who were not working for pay in Wave 2 also said they were retired; the remaining 36 percent said they were unemployed, disabled, or "not in the labor force." Although the fraction of nonworkers who say they are retired grows over time, even by Wave 6, only 87 percent of nonworkers say they are retired.

[3] As Blau (1994) has noted, wave-to-wave transition measures miss short unretirement spells that occur between waves, and whose importance is debatable. Using the detailed between-wave job history information to identify short unretirement spells in the HRS, I found that while about five percent of retirees re-enter and exit the labor force between waves, their spells were of very short duration and associated with extremely low annual earnings.

with identifying transitions, provides details about the procedure used to impute missing transition dates, and describes sample restrictions.

2.2 An Overview of Retirement Paths

I start with an overview of the different retirement paths followed by the original HRS cohort members (b. 1931-1941) and their spouses, who were first interviewed in 1992 and re-interviewed every other year through 2002. Table 1 shows the retirement paths chosen by HRS respondents who first retired after 1992 and who are observed for at least six years following their first retirement. Row 1 shows that 52.2 percent of retirees transitioned from work to full retirement and remained fully retired during the following six or more years. This suggests that retirement is an absorbing state for only half of retirees, whereas the other half takes a path involving partial retirement and/or unretirement. Rows 2 and 3 show that 12.9 percent of retirees fully retired then later returned to part-time work, whereas about half as many (6.3 percent) returned to full-time work after fully retiring. Another 7.2 percent (row 6) initially partially retired then resumed full-time work. Summing rows 2, 3, and 6 yields a total of 26.4 percent of retirees who ever unretired following their initial retirement. As a group, they constitute over half of those who follow a non-traditional retirement path.

Table 1 also illustrates the empirical importance of partial retirement. Some 28.6 percent of retirees transitioned directly from work to partial retirement,[4] whereas another 12.9 percent entered partial retirement after an initial spell of full retirement. In total, 41.5 percent of retirees

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To avoid overstating the importance of unretirement, these very short spells are not included in the analysis. Additional details are given in the Data Appendix.

[4] About 5 percent of reported retirement transitions are from part-time work to partial retirement. While it is possible that these are true retirements, it is also possible that these represent response errors.

chose a retirement path involving a spell of partial retirement, which falls between Gustman and Steinmeier's (1984b) estimate of one-third and Ruhm's (1990) estimate of one-half.[5]

2.3 Retirement Paths Featuring Unretirement

Table 2 shows the percent ever unretiring for the entire sample and various demographic subgroups, while varying the length of the post-retirement observation period. The first column shows the percent who ever unretire without controlling for the observation period, whereas the second column restricts the sample to those observed at least one year after their initial retirement. The figures are lower in the first column, reflecting a downward bias due to censoring: the denominator includes many recent retirees who have not yet had an opportunity to unretire. The figures are highest in the last column, where the percent ever unretiring is computed for the subset of respondents observed the longest, at least six years after their first retirement. Focusing on the last column, the first row shows that over a period of at least six years, 26.4 percent of retirees return to work.[6] This estimate is surprisingly close to Ruhm's (1990) estimate of 25.4 percent in the older Retirement History Survey (RHS) cohort (b. 1905-1911).[7] This is surprising given the two-decade difference between the cohorts, and would appear to suggest little change over time in the likelihood of unretirement; however, Ruhm's estimate includes unemployed workers who transition to second careers at relatively young ages. Thus, if the definitions of retirement and unretirement used here were applied to Ruhm's sample,

[5] Although the two papers use the same data; Ruhm's definition of retirement is quite broad, potentially including transitions to second careers by individuals in their 40s. In contrast, Gustman and Steinmeier consider only transitions to partial retirement from full-time jobs held at age 55.

[6] Note this is *not* an estimate of those who return to work after six years of retirement; rather it is an estimate of the percent ever unretiring among those who are observed for at least six years after retirement; they may have unretired at any time during the observation period.

[7] Ruhm reports unretirement estimates separately for the partially retired (26.1 percent) and fully retired (24.9 percent). I have taken a weighted average of Ruhm's separate estimates to construct a single estimate that is comparable to those presented here.

the estimated unretirement rate would likely be lower. [8] Blau (1994) examined quarterly employment transitions in the RHS panel and found that 25.7 percent of non-employment spells ended in re-entry, and similarly 22.6 percent of part-time employment spells ended in a transition to full-time work. As with Ruhm's analysis, transitions out of unemployment as well as retirement are included, implying that the percentage re-entering from retirement only would be lower. Support for this assertion comes from Rust (1990), who tracked employment sequences over 10 years of RHS data and found that 19 percent of sequences involved re-entry after an initial self-report of retirement whereas 29 percent involved re-entry after a spell of either unemployment or self-reported retirement.

Other estimates of unretirement rates in the literature are much smaller, owing primarily to the use of short observation periods, but also possibly to the fact that most were computed for older cohorts. For example, Gustman and Steinmeier (1984a) estimated a 16.6 percent unretirement rate over a two-year period in the RHS; Berkovec and Stern (1991) reported one-year unretirement rates ranging between 6.3 to 13.2 percent depending on age in the National Longitudinal Study of Older Men (NLS);[9] Diamond and Hausman (1984) reported two-year re-entry rates of retired workers in the NLS of 9.6 to 17.6 percent depending on age; and Benitez-Silva (2003) found that about 12.6 percent of nonworkers (not necessarily retirees) in the HRS re-entered the labor force within 24 months.

Table 2 also reveals some variation in unretirement patterns by demographic characteristics. Men are much more likely to ever unretire than women, and Hispanics are least likely to unretire compared to blacks and whites, who are similar in this respect. The likelihood

[8] The observation periods underlying the two sets of estimates are similar. Ruhm's estimates are based on an 8-year observation period following first retirement, whereas mine are based on an average observation period of 7.7 years (a minimum of 6 and a maximum of 10 years).

[9] The NLS cohort was born during 1907-21 and thus mostly lies between the RHS and HRS cohorts.

of ever unretiring does not vary by education, which signals that unretirement may not be strongly correlated with low wealth accumulation or poor planning.

The most striking differences arise with respect to age of first retirement. Those retiring in their early 50's are quite likely to ever return to work; this likelihood declines for those who first retire in their late 50's, then flattens out for those who first retire in their early 60s.[10] There is some evidence of a spike in the likelihood of ever unretiring for those first retiring at age 63, but this likely reflects sampling variability.[11] One explanation for the high unretirement rates among early retirees is the interaction between employer defined benefit pension incentives, legal impediments to claiming a pension while remaining a regular salaried employee, and employer minimum hours requirements. Those incentivized to begin claiming their pension at the plan's early retirement age must also separate from their jobs, and if they wish to continue doing paid work, must generally seek employment elsewhere.[12]

2.4 Unretirement Hazard Rates

It is also of interest to know how quickly retirees return to the workforce following retirement. Figures 2a and 2b show nonparametric unretirement hazard rates by gender, and by first retirement age. The unretirement hazard rate is the probability of returning to work (or increasing labor supply in the case of partial retirement) conditional on having retired and not yet returned to work.[13] For both men and women, the unretirement hazard initially rises steeply, peaks two years following retirement, then steadily declines. The hazard rate is everywhere

[10] An age gradient was also noted by Berkovec and Stern (1991) in the older NLS cohort, with Ruhm (1990) in the RHS cohort, and with Benitez-Silva (2000) in the HRS cohort.

[11] Because the HRS panel starts out relatively young (ages 51-61), only small numbers of respondents are observed for several years following a first retirement at age 63 or later.

[12] In the U.S., it is not legal for an individual to be simultaneously a regular employee and pensioner of the same firm unless they have reached their pension plan's normal retirement age.

[13] The hazard is shown in continuous time since actual dates (month and year) of retirement and unretirement are used instead of discrete two-year intervals based only on reported status at each survey wave.

higher for men. The declining hazard is suggestive of both state dependence and unobserved heterogeneity. For example, the longer a retiree has been out of the workforce, the more his human capital may depreciate, or it could be that those out of the workforce longer have relatively high marginal values of leisure or low returns to work. Most importantly, the declining profiles suggest that unretirement is not predominantly a response to financial shocks, since if this were the case we might expect a flat profile over time.[14]

In contrast, the patterns by age of first retirement are quite varied. For those retiring in their early 50s, the hazard rate is notably elevated during the first five years following retirement then declines, suggesting a somewhat different retirement process for the youngest retirees. In particular, retirees in their early 50s are about 20 percent more likely than older retirees to have retired involuntarily and thus may maintain interest in returning to the labor force for a longer period following retirement than do older retirees. Also of note is that the unretirement hazard following retirement at ages 62-64 is *lower* than the hazard following retirement at ages 65 and older in the first three years. This could reflect heterogeneity in preferences for work, but may also in part reflect the elimination of the Social Security earnings test at the normal retirement age beginning in 2000.[15]

3. A Retirement Model with "Burnout and Recovery"

3.1 Theoretical Model

I next present a model of retirement that shows how both expected and unexpected unretirement transitions might arise. Suppose that in each period $t=1,2,...,T,$ an individual's

[14] This pattern does not rule out all financial shocks, since it could be consistent with informational shocks arising shortly after retirement as individuals become aware of their true state of retirement preparedness.

[15] The earnings test was maintained between ages 62 and the normal retirement age, and eliminated thereafter. The normal retirement age increases with year of birth for cohorts born after 1937 and before 1960.

utility depends on consumption c_t and hours worked h_t, which is defined discretely to reflect minimum hours constraints. Let the within-period utility function take the form:

$$U(c_t, h_t) = \frac{1}{1-\gamma}\left[c_t^{\alpha}((1-h_t)\phi(g_t))^{1-\alpha}\right]^{1-\gamma}. \quad (1)$$

An individual's time endowment is normalized to 1, such that $(1-h_t)$ is the amount of leisure consumed, $\phi(g_t)$ is a "burnout/recovery" function that affects the marginal utility of leisure in every period, and $\phi'(g_t) > 0$. The variable g_t is a time-varying work history variable, such as the percent of the last 30 years worked by the individual. With each additional year of work, g_t rises and since $\phi'(g_t) > 0$, "burnout" also rises. After retirement, g_t steadily declines and "recovery" occurs. If at some point the individual returns to work, g_t begins to rise again and so does burnout. The burnout/recovery function can also include other variables that shift the marginal utility of leisure up or down such as health status, or even unobserved heterogeneity. The addition of the burnout/recovery function distinguishes this model from those in the retirement literature, which have primarily allowed reverse transitions to arise through stochastic realizations of the budget constraint, and not through dynamic preferences for leisure.

The dynamic program for the individual is given by the Bellman equation

$$V_t = \max_{d_t}[U_t + \delta\pi E_t(V_{t+1} \mid \Omega_t, d_t)], \quad (2)$$

where δ is a subjective discount factor, π is the probability of survival from *t* to *t+1*, and $d_t = d(\Omega_t)$ is a vector of optimal choices over consumption and hours worked, which is conditioned on information known at time *t*, Ω_t.

The individual maximizes the Bellman equation subject to the period budget constraint:

$$a_{t+1} = a_t(1+r_t) + w_t h_t + db_t(g_t, q_t, age_t) + ss_t(g_t, h_t, age_t) + y_t - c_t - m_t \qquad (3)$$

where a_t is financial assets in period *t* (which could include DC pension assets); r_t is a stochastic real interest rate; w_t is the hourly wage; db_t is the value of DB pension payments, which depend on work history, age and whether the individual has separated from a job providing DB pension coverage $(q_t = 1)$; ss_t is the value of social security benefit payments, which are a function of work history, age and hours worked in accordance with eligibility rules and the Social Security earnings test, m_t is stochastic healthcare expenses, which could include out-of-pocket expenses as well as insurance premiums; and y_t is other income, which could include transfers, spousal earnings and spousal pension payments. Finally, post-retirement job offers are not received with perfect certainty and wages are randomly distributed; that is, although a retiree may want or need a job, he may not receive a wage offer that exceeds his reservation wage. Individuals receive a wage offer in every period with probability p .

3.2 Graphical Illustration

The top panel of Figure 1 shows how burnout and recovery can lead to optimal unretirement. As individuals accrue many sequential years in the labor force, they grow steadily (and predictably) tired of working (i.e., burned out). Eventually, their marginal value of leisure surpasses the marginal benefit from continued work, and they retire (point r_1). But once they retire, recovery sets in. As they accumulate months of leisure, the marginal value of leisure declines; if it falls below the marginal benefit of work, they may again choose to work (point w). In this example, recovery occurs over time; however, if recovery were instantaneous, the individual would transition directly to a new job (e.g., partial retirement). The marginal utility of

leisure could theoretically fluctuate with repeated episodes of labor force participation but at some point the individual becomes permanently burned out, and recovery is not possible. This could occur when the individual becomes too old, too sick, or tired of work. Because entry and exit are driven by the marginal value of leisure relative to the return to work, this framework accommodates non-wage aspects of jobs that affect the utility of work.

The bottom panel shows how uncertainty can interact with burnout and recovery. Because the marginal benefit of work is affected by stochastic realizations of asset returns (r_t), healthcare expenses (m_t), and the probability of receiving a post-retirement wage offer (p) greater than the reservation wage, it can shift up or down in any period. In the picture, I suppose the individual receives a shock which shifts the marginal benefit of work up in the period following retirement, causing it to exceed the marginal utility of leisure at that point, which induces the individual to re-enter the labor force sooner than in the absence of the shock. If instead the shock causes the marginal benefit curve to shift downward, and is sufficiently large, it is possible that during the recovery phase the marginal utility of leisure never declines enough to induce the individual to return to work. In this case, retirement becomes an absorbing state.

To summarize, the model shows how burnout and recovery can generate predictable unretirement transitions (as well as partial retirement transitions), whereas uncertainty can generate unexpected transitions (or more precisely, departures from the expected labor supply path). Predictable transitions can also be the result of variables that evolve in a predetermined fashion, such as temporary work disincentives created by the Social Security earnings test or private pension programs. Furthermore, burnout and recovery interact with uncertainty; an individual who expected to unretire after sufficient recovery might not if a shock reduces the marginal benefit of work, and someone who thought no amount of recovery could ever make

work attractive again might be induced to unretire by an unexpectedly high wage offer that raises the return to work. Similarly, if we allow uncertainty in preferences for retirement leisure, those who find retirement less satisfying than expected would experience an unexpected drop in the marginal utility of leisure that may be sufficient to induce some to return to work.

The model suggests a simple way of testing whether stochastic events are an important impetus of unretirement. If an individual's expectation of work after retirement equals his realization, i.e., if $E_t(V_{t+1} \mid \Omega_t, d_t) = V_{t+1}$, then it must be true that no new information arrived that caused the individual to revise his plan. In this case, knowledge of Ω_t and d_t accurately predict whether the individual will unretire at *t+1*. If on the other hand, $E_t(V_{t+1} \mid \Omega_t, d_t) \neq V_{t+1}$, then the individual must have received new information which caused him to revise his plan, and Ω_t and d_t are not good predictors of whether he or she will unretire at *t+1*. In the sections that follow, I use elicited expectations combined with subsequent realizations to assess the extent to which expectations match realizations.

4. Expectations and Realizations of Work after Retirement

4.1 Do Expectations Match Realizations?

At their baseline interview in 1992, working respondents were asked the following question about their expectations of work during retirement: "Some people want to stop paid work entirely when they retire, while others would like to continue doing some paid work. What about you?" A simple test of whether unretirement transitions are planned or a response to shocks is to tabulate responses to this question among those later observed to unretire. Strikingly, I find that 81.7 percent of eventual unretirees said they expected to work during retirement. The figure is identical (81.7) among eventual partial retirees, underscoring the similarity of the two

retirement paths. In short, this piece of evidence strongly suggests that the vast majority of unretirement transitions were intended prior to retirement, just like partial retirement transitions. For comparison, 62.4 percent of those who did not work during retirement (either unretirement or partial retirement) said they expected to work (T-stat for difference = -8.0). Although this expectation is significantly lower than that of those who did work, it is still somewhat high and raises the question of how well expectations match realizations generally, without conditioning upon realizations of a particular type.

To address this question, I construct a categorical measure of accuracy by subtracting an indicator variable for whether the respondent expected to work from an indicator variable for whether the respondent realized work. I count both partial retirement and unretirement as work realizations since the expectations question does not distinguish one from the other. Values of -1 indicate "pessimistic" expectations (the individual expected to work but *did not* in fact do so), values of 0 indicate "accurate" expectations, and values of 1 indicate "optimistic" expectations (the individual expected *not* to work but in fact did so).[16] At the individual level inaccurate expectations do not necessarily imply irrational behavior; expectations need not be equal to realizations if the state variables upon which the expectations were based have changed.[17] Rather we can use the presence and type of forecast errors to infer the extent to which unexpected information has arrived in the period between expectation and realization, and whether this new information is predominantly positive or negative.

[16] In applying the labels "pessimistic" and "optimistic," I adopt the conventional perspective that individuals receive disutility from work; however, if work after retirement is instead utility enhancing, the labels could be reversed.

[17] Because the work expectations survey question requires a yes-no answer, it is somewhat of a crude measure; those who expect to work with a probability between 0 and 1 are forced to choose an extreme value. This means that testing for rational expectations at the aggregate level could be hampered by the imprecision with which expectations are elicited.

The first row of Table 3 shows the percent of retirees whose work expectations were optimistic, pessimistic or accurate. Remarkably, over half the sample (55.2 percent) reported accurate expectations. About one-third (37.3 percent) of retirees were pessimistic (they thought they would work but in fact did not), whereas just 7.5 percent were optimistic (they thought they would *not* work but in fact did).[18] Based on the model in Section 3, I interpret this pattern to suggest that the majority of respondents did not experience an economic or informational shock after retirement sufficient to cause a revision of their pre-retirement plans. Of the remaining 44.8 percent who did receive new information, the pattern suggests that if the shocks were financial in nature, they were predominantly positive. Indeed, 83 percent of this group (37.3/44.8) received information that caused them to depart from their pre-retirement plan of working. Examples might include news of unexpected investment gains, or the realization that retirement resources were more than adequate to meet retirement needs. However, the pattern is also consistent with the onset of health shocks that may have prevented some from executing their work plans, and which may or may not have had financial implications depending on insurance coverage.[19] Of the minority who received information after retirement causing them to re-optimize in favor of work, some may have received negative financial information, but it is also possible that they simply received an unexpected job offer that exceeded their reservation wage.

To help sort among these potential explanations, Table 3 also compares wealth and health changes for respondents in each group. The median individual with pessimistic expectations experienced a pre-/post-retirement change in net worth of 4.4 percent, whereas the median

[18] In order to boost the number of observations in the optimistic group, the sample used for this table is all retirees observed two or more years after their first retirement.

[19] It is also possible that some of this group searched for and failed to attain jobs, which would be a negative financial shock of a different sort.

individual with optimistic expectations experienced no change in net worth. Wealth changes at the 75th percentile were also larger for the pessimistic group than for the optimistic group.

A natural explanation for this pattern is the unprecedented performance of the stock market during my sample period.[20] In their study of consumption changes at retirement, Ameriks, Caplin and Leahy (2002) found that households expected sharper decreases in consumption than were actually realized, and the authors attributed much of the gap between expectations and realizations to stock market participation.[21] However, the HRS data do not point to unexpected stock market gains as an important reason for unfulfilled work expectations. The median person in all groups experienced no change in the value of stockholdings, which for the median person were zero before and after retirement, and at the 75th percentile, the gains in stock value are highest for the optimistic group, not the pessimistic group. This pattern suggests two findings: 1) the receipt of positive stock market news is not a principle reason for unfulfilled work expectations and 2) the receipt of negative stock market news is not a principle reason for unplanned unretirements.

Additional insight can be gained by comparing respondents' ex-ante and ex-post perceptions about retirement. Prior to retirement, respondents were asked whether they were worried about "not having enough income to get by" during retirement or about "not doing anything productive or useful" during retirement.[22] Retired respondents were asked a follow-up

[20] According to the National Bureau of Economic Research, the economic expansion of the 1990's began in March 1991 and ended in March 2001 (Hall et al., 2001).

[21] Ameriks, Caplin and Leahy (2002) analyzed data for TIAA-CREF participants in January 2000 and January 2001.

[22] In Waves 1-3, respondents who did not report being completely retired were asked: "Now for things that some people say are bad about retirement. Please tell me if they worry you a lot, somewhat, a little, or not at all: Not having enough income to get by." Also listed was "Not doing anything productive or useful." In wave 1, the first part of the question was slightly different: "Now for things that worry some people about retirement. Please tell me …"

question asking if they were actually bothered by not having enough income or not being productive.[23] This information is available for respondents who retired between 1992 and 1996.

From Table 3, it is immediately evident that the pessimistic group was more prone to ex-ante worrying than the optimistic group. For example, 59.6 percent of the pessimistic group worried about income (a lot or somewhat) compared to just 35.3 percent of the optimistic group. Similarly, 35.9 percent of the pessimistic group worried about not being productive compared to 20.4. Worries about income declined significantly after retirement for the pessimistic group, suggesting that realized retirement turned out better than expected, at least as far as finances were concerned.[24] In contrast, ex-post worries about retirement income rose slightly (though not significantly) among the optimistic group. The pattern is reversed for worries about not being productive. There was little change in the percent worried ex-ante and ex-post among the pessimistic group, but a substantial increase in worries about not being productive among the optimistic group (from 20.4 to 34.7 percent). This suggests that the dominant explanation for unplanned unretirements may be preference shocks, not income shocks.

Health-related changes are also an important part of the picture. Individuals in the pessimistic group were more likely to experience a health shock (26.7) than the optimistic group (19.8), which suggests that realized health plays an important role in facilitating the fulfillment of work expectations after retirement. In contrast, unexpected medical expenses of a family member do not appear to be associated with unplanned unretirement, as married respondents in all groups were just as likely to have a spouse who experienced a health shock. Nonetheless,

[23] In Waves 1-3, retired respondents were asked a variant of the same question: "Now for things that some people say are bad about retirement. Please tell me if, during your retirement, they have bothered you a lot, somewhat, a little, or not at all: Not having enough income to get by." Also listed was "Not doing anything productive or useful."

[24] Such an interpretation is not without precedence: Mastrogiacomo (2003) found that older Dutch households were overly pessimistic about their financial situation in comparisons of ex-ante expectations and ex-post realizations.

optimistic individuals were more likely to become uninsured after retirement, suggesting that changes in medical expense *risk* may be an important motivation for unplanned unretirement, as long as the changes in risk were unexpected.[25]

On balance, the expectations data suggest four key findings: 1) most unretirements were planned prior to retirement; 2) when realizations diverged from prior expectations, individuals were more likely to have been too pessimistic (expecting to work but not in fact working) rather than too optimistic (expecting not to work but in fact working); 3) among those who were too pessimistic, the evidence points to the arrival of positive news about financial position after retirement (though not driven by the stock market gains) and/or negative news about health; 4) among the small minority who were too optimistic, the evidence points to the arrival of negative news about preferences for retirement leisure, rather than negative news about financial position; one possible exception is that loss of health insurance coverage may have prompted some to return to work.

4.2 The Predictability of Unretirement

The model in Section 3 suggests another way of testing whether unretirement transitions are mostly anticipated or unanticipated. If anticipated, then in a model explaining unretirement, variables describing the post-retirement information set should add little predictive power once variables describing the pre-retirement information set are included. The same should be true in a model of partial retirement, since the partial retirement transition is made prior to realization of the post-retirement information set. Thus, the partial retirement case offers a useful benchmark against which to judge the case of unretirement.

[25] This would be true if an individual unexpectedly lost health insurance, but could also be true for someone who changed health insurance plans and was not fully aware of the resulting changes in expected out-of-pocket expenses. Even for someone who did not lose or change health insurance, medical expenditure risk could change if the individual experienced a health shock associated with large out-or-pocket expenses.

These insights suggest a straightforward estimation framework to test the predictability of unretirement. I adopt the perspective that individuals first decide whether to retire, then conditional upon the decision to leave their jobs, they select one of three retirement paths: retire fully and never return to work, transition directly to a part-time job (partial retirement) then retire fully, or take a break from work and return at a later point (unretirement). This perspective readily translates to a multinomial logit model over choices defined by full retirement, partial retirement and unretirement, and can be estimated for those observed to retire.[26] I assess the relative importance of the pre- and post-retirement information sets by first estimating the model of retirement path choice using only pre-retirement information, then re-estimating the model with both the pre- and post-retirement information sets.[27] Specifically, if *r* denotes individual *i*'s retirement date, then let *r-1* denote the survey wave prior to retirement and *r+1* the survey wave after retirement. Individual *i* chooses retirement path $y_i = k$, where $k = 1, 2, 3$, at time *r* conditional upon the pre-retirement information set $X_{i,r-1}$ with probability:

$$P(y_{i,r} = k \mid X_{i,r-1}) = \frac{e^{X'_{i,r-1}\beta_{k,r-1}}}{\sum_j e^{X'_{i,r-1}\beta_{j,r-1}}} \tag{4}$$

The probability of choosing retirement path $y_i = k$ at time *r* conditional upon both the pre-retirement information set $X_{i,r-1}$ and the post-retirement information set $X_{i,r+1}$ is:

$$P(y_{i,r} = k \mid X_{i,r-1}, X_{i,r+1}) = \frac{e^{X'_{i,r-1}\beta_{k,r-1} + X'_{i,r+1}\beta_{k,r+1}}}{\sum_j e^{X'_{i,r-1}\beta_{j,r-1} + X'_{i,r+1}\beta_{j,r+1}}} \tag{5}$$

[26] In principle one could estimate a more general model in which the choice of whether to retire in any given period is also modeled. That route is not pursued here for two reasons: 1) the concept of a pre- and post-retirement information set is not well defined for an individual who has not yet retired, and 2) the framework adopted here is sufficient to perform the analyses of interest.

[27] In neither model does a generalized Hausman test reject IIA.

If the retirement path choice is indeed made at time *r*, then information available at *r+1*, should have little effect on the choice of retirement path. If, on the other hand, individuals revise their initial retirement path choice as new information arrives, then information available at *r+1* may affect the retirement path choice, which would be more appropriately characterized as a series of sequential choices rather than a single decision. This is simply a test of whether the $\beta_{k,r+1}$ are equal to zero. Another convenient aspect of this approach is that it is easy to test whether $\beta_k = \beta_j$ for $k \neq j$; in other words, I can assess the degree of similarity between the partial retirement and unretirement paths.

Model 1 of Table 4 shows multinomial logit coefficients for the partial retirement and unretirement path choices, considering only pre-retirement information. The reference group is full retirement. Descriptive statistics for all variables included in the model are shown in Appendix Table 1. Beginning with pre-retirement demographics and health status, age at first retirement enters as a linear function interacted with a dummy for first retirement age equal to 62 in order to allow the intercept and slope of the retirement age profile to change at the Social Security early retirement age. For those first retiring prior to age 62, the relative probability of selecting the unretirement path declines as retirement age rises, whereas the relative likelihood of choosing partial retirement is not statistically significant. For those retiring at age 62, there is a discrete drop in the probability of choosing partial retirement over full retirement (though not precisely estimated), and a rise in the likelihood of choosing unretirement (also imprecise). Although the pattern is not strong, it suggests a binding SSA retirement earnings test at age 62 for at least some individuals: those who favor continued work may substitute away from partial

retirement as the penalty for partial retirement rises at age 62.[28] For those first retiring after age 62, the retirement age coefficients are imprecisely estimated, although they suggest that the relative probability of partial retirement declines in retirement age.

With regard to other demographic characteristics, men are more likely than women to choose partial retirement or unretirement over full retirement. Blacks are significantly less likely to choose partial retirement but more likely to choose unretirement, whereas the reverse is true of whites. Marital status and education have no detectable effect on either choice. Both partial retirement and unretirement are less likely for those in fair or poor self-reported health before retirement.

If unretirement arises because of negative financial shocks, greater retirement resources should have a protective effect, reducing the probability of unretirement. Surprisingly, pre-retirement (log) income is weakly positively associated with both partial retirement and unretirement, contrary to what one would expect if work after retirement were predominantly associated with low socio-economic status. Net worth is negatively correlated with both partial retirement and unretirement but its coefficients are not statistically significant. Those entitled to an employer-provided pension and/or retiree health insurance are significantly less likely to choose partial retirement over full retirement; however, this is not necessarily true for unretirement as the coefficients are smaller (quite a bit so for pension entitlement) and statistically insignificant.[29] This pattern points to the possibility that pension entitlement may facilitate the "recovery" phase for those who wish to take a break from working while they decide what to pursue next. The patterns by occupational group also suggest a positive

[28] About 80 percent of retirees in my sample retired prior to 2000, when the SSA earnings test was eliminated at the full retirement age. SSA withholds $1 in benefits for every $2 in earnings in excess of the exempt threshold, currently $12,060 (2007).

[29] In contrast, Ruhm (1990) and Benitez-Silva (2000) find that unretirement is less likely among pensioners, and Benitez-Silva (2000) also finds that labor force re-entry is less likely among those with health insurance.

correlation between unretirement and retirement resources. Most notably, those in managerial/professional specialty or precision production/craft/repair occupations before retirement are significantly more likely to choose partial retirement or unretirement than are operators and laborers (the reference group), or those in service occupations.

Turning next to pre-retirement financial planning, perceptions about retirement, and work expectations, respondents with a short financial planning horizon (the next few months or next year) were no more likely to choose partial retirement or unretirement over full retirement, suggesting that choosing a retirement path that involves work after retirement is not related to inadequate retirement planning. Similarly, those who reported in the period prior to retirement that they were worried about having enough income during retirement were no more likely to choose partial retirement or unretirement. On the other hand, pre-retirement expectations of work during retirement are highly predictive of choosing partial retirement or unretirement over full retirement. If partial retirement were for planners and unretirement for those who experienced shocks, the expectations variable should be more predictive of partial retirement and less predictive of unretirement, but this is not the case. Exponentiating the logit coefficients to obtain the relative probabilities reveals that partial retirement and unretirement are respectively 260 and 273 percent more likely than full retirement if the individual said they expected to work during retirement. The estimated coefficients are highly significant, with t-statistics of 6.1 and 5.4, respectively. The implied marginal effects (not shown) indicate that an affirmative work expectation increases the probability of unretirement by 9 percentage points or 50 percent, and the probability of partial retirement by 12 percentage points or 44 percent.

A Hausman test of equality between the full sets of coefficients for partial retirement and unretirement indicates that their magnitudes are statistically different; however in most cases the

coefficient estimates point to qualitatively similar effects. Indeed, it does not appear that the pre-retirement information set is more predictive of partial retirement than unretirement, suggesting that unretirement and partial retirement are more alike than not.

Model 2 of Table 4 adds elements of the post-retirement information set, specifically variables measuring changes in net worth, health, medical expenses, and health insurance, measured between the waves preceding and following retirement. It is impossible to identify whether the changes were anticipated or unanticipated by respondents, however, some component of the variation will certainly reflect unanticipated changes. The test applied here is two-fold: If unretirement is a response to financial information received after retirement, then the addition of such variables should add predictive power to the model. Moreover, the variables should primarily affect the choice of unretirement rather than partial retirement, since partial retirement here is by definition chosen at the time of retirement.

Owing to measurement error in net worth, stockholdings, and medical expenses, I use dummy variables indicating large changes of 25 percent or more. The coefficient estimates reveal that conditional upon choosing to retire, there is no relationship between retirement path choice and experiencing a 25 percent or greater drop in (non-housing) net worth or stock holdings, a 25 percent or greater increase in out-of-pocket medical expenses, or losing health insurance. For partial retirement, this is the expected outcome since partial retirement transitions are determined at the time of retirement; on the other hand, the intention to unretire may be formed either at the time of retirement, or at some later time after the revelation of post-retirement information. The evidence suggests that the former is the dominant explanation; post-retirement financial information has little effect on the choice of unretirement over either full retirement or partial retirement. Although it cannot be said to what extent these changes

were unanticipated, these results casts further doubt on the hypothesis that unretirement is primarily a response to financial shocks.

As indicated by the expectations data in Table 3, changes in perceptions about retirement income and being productive during retirement play an intriguing role. Becoming more or less worried about income after retirement has no impact on the choice of unretirement relative to full retirement, whereas becoming more bothered by not being productive significantly increases the probability of unretirement. In contrast, becoming more worried about income significantly raises the probability of partial retirement, whereas becoming less worried significantly lowers the probability of partial retirement. The fact that these changes affect the partial retirement decision, suggests some slippage in the timing of the underlying shifts in perceptions relative to the timing of the retirement transition. Changes in perceptions about productivity have no impact on the probability of partial retirement.

Experiencing a health shock (a change in the number of chronic disease conditions ever had) renders both partial retirement and unretirement statistically less likely by a similar magnitude. This could explain why individuals do not appear to increase labor supply to pay for medical bills; the health shock that causes the rise in out-of-pocket spending may limit work capability. It is surprising that a post-retirement health shock would affect the retirement decision, but one potential explanation is that the health shock measure is correlated with unobservable aspects of pre-retirement health. A second explanation is that some measured health shocks may actually precede the partial retirement transition because the dates of health shocks are unknown; in the absence of dating, it is impossible to know whether a given health shock occurred before or after retirement. This is not the case for unretirement transitions since they occur later.

Although the elements of the post-retirement information set do not individually affect the choice of retirement path, they may in combination. Indeed, the likelihood function declines (from -1716 to -1654) and the Pseudo R^2 rises with the addition of the post-retirement information set; a formal Likelihood Ratio Test confirms that Model 2 is statistically preferred. However, in terms of the model's ability to correctly predict observed outcomes, little is gained. Excluding the post-retirement information set, the model predicts 52 percent of observations correctly. Including the post-retirement information set, the model predicts 54 percent correctly.

In sum, the models offer little support for the hypothesis that unretirement is predominantly a response to financial shocks, however there is some evidence that shocks to preferences for retirement leisure (e.g., discovering retirement to be less enjoyable than expected) cause some to return to the labor force. Although interesting, shocks of this nature are clearly of less concern from the perspective of policy. Rather, the substantial predictive power of work expectations confirms that most individuals have formed their intentions about partial retirement and unretirement prior to retiring. If anything, work expectations are more likely to go unfulfilled than leisure expectations. In fact, positive financial news and negative health shocks play central roles in preventing some from fulfilling their post-retirement work expectations.

5. Characteristics of Post-Retirement Jobs

The preceding analyses point to a similarity between partial retirement and unretirement in terms of the characteristics and motivation of people who choose these retirement paths. In this final section, I examine the extent to which the jobs themselves are similar. Table 5 presents a comparison of the characteristics of pre-retirement, partial retirement and unretirement jobs, where unretirement jobs are split by part-time or full-time. Recall that by definition, partial

retirement jobs are part-time jobs. Consistent with evidence from prior studies of bridge jobs, the median hourly wage on partial retirement ($10.32) and unretirement jobs ($8.35/$9.00) is significantly lower than the median wage earned on pre-retirement jobs ($15.45). The lower wage associated with both part-time and full-time unretirement jobs relative to both partial retirement jobs and pre-retirement jobs could reflect loss of human capital associated with having left the labor force for a spell, or career changes. The earnings "replacement rate" for post-retirement jobs relative to pre-retirement jobs is also shown for each job type. At the median, partial retirement jobs replace about half of pre-retirement annual earnings, whereas full-time unretirement jobs replace a quarter and part-time unretirement jobs replace only 7.6 percent. Nonetheless, part-time unretirement jobs are similar to partial retirement jobs both in terms of average weekly hours and average weeks worked per year.

The need to maintain health insurance coverage may be an important motivation behind post-retirement employment. Part-time unretirement jobs are least likely to offer health insurance coverage (35.5 percent), whereas nearly half of full-time unretirement jobs (48.3 percent) offer health insurance coverage. Partial retirement jobs are most similar to full-time unretirement jobs in this regard, but still the coverage rate is substantially lower than for pre-retirement jobs (65.8 percent). There are strong differences in self-reported job stress across types. Not surprisingly, pre-retirement jobs are most stressful (62.7 percent), followed by full-time unretirement jobs (40.1 percent), partial retirement jobs (33.9 percent), and part-time unretirement jobs (23.8 percent). This pattern points to stress reduction as an important motivation for choosing a non-traditional retirement path among those who are not yet ready to leave the labor force permanently. There are less obvious differences in physical requirements

across job types, though part-time positions (both partial retirement and part-time unretirement jobs) appear to be moderately less physically demanding.

The distribution of jobs across industries is similar for partial retirement and unretirement jobs, and relative to pre-retirement jobs, there is a notable shift out of the manufacturing sector and into the services sector, especially for part-time positions.[30] Similarly, there is a parallel shift out of managerial/professional specialty occupations and into sales/admin support and services positions. Finally, about 60 percent of unretirees changed occupations compared to just 36 percent of partial retirees (not shown), and this is reflected in the fact that the occupational distribution of partial retirement jobs is more similar to the occupational distribution of pre-retirement jobs.[31] If, as these figures suggest, partial retirement jobs are more closely related to the pre-retirement career than unretirement jobs, they may be easier to obtain without taking time out of the labor force to engage in search or skill building. This could also explain the wage differential between the two types.

Finally, the duration of unretirement versus partial retirement jobs is also of interest. Using a censored normal regression model of job tenure with no covariates to obtain an estimate of the uncensored mean job length yields an estimate of 4.6 years for partial retirement jobs and 4.3 years for unretirement jobs. Though not fully comparable, this estimate falls between Gustman and Steinmeier's (1984a) estimate of about 3 years for time spent in partial retirement and Ruhm's (1990) estimate of 5.2 years for time spent in partial retirement.

In sum, the descriptive evidence suggests many similarities between unretirement and partial retirement jobs, but also interesting differences. In particular, the data suggest that those who can find post-retirement jobs relatively easily transition directly to partial retirement,

[30] A similar shift was noted by Reimers and Honig (1993).

[31] These figures were calculated over disaggregated 3-digit industry and occupational codes rather than the aggregated categories shown in Table 4.

whereas those who must spend more time searching (or perhaps re-tooling of skills) pass through a period of retirement before starting their post-retirement jobs. This is suggested by the fact that those who unretire are more likely to have changed occupations than those who transitioned directly to partial retirement. In terms of the burnout-recovery model posited earlier, recovery may take longer for unretirees if their marginal disutility of work only declines with the prospect of doing something different, which may require time spent introspecting, doing research, or engaging in search. On the other hand, those who choose partial retirement may be content with their current occupation but desire fewer hours, in which case they "recover" immediately at the prospect of a new part-time job in their same occupation.

6. Conclusions

Unretirement and partial retirement are empirically important phenomena. Nearly one-half of retirees follow a nontraditional path that involves partial retirement and/or unretirement. Of retirees, 26.4 percent of those observed for at least six years after their first retirement return to work at some point during the interval, most commonly about two years after retirement. The unretirement rate is even higher among younger retirees (as high as 35 percent among those retiring at ages 53-54).

To help understand these facts, I offer a theoretical model that illustrates how unretirement transitions could arise either unexpectedly due to uncertainty in asset returns, medical expenses, or wage offers, or via preferences as individuals predictably "burn out" on their career jobs, retire, then re-enter the workforce after a period of "recovery." Using the model as guidance, the body of evidence presented in this paper strongly supports the hypothesis that unretirement transitions are mostly anticipated prior to retirement, and thus are not a

response to financial shocks experienced after retirement, or a result of poor planning or low wealth accumulation.

In support of this conclusion, I present four key pieces of evidence: First, 82 percent of unretirement transitions were intended prior to retirement. In support of this finding, I show that information received after retirement adds little explanatory power to a model of retirement path choice after controlling for information available prior to retirement. In fact, the probability of unretirement is unresponsive to large declines in net worth or increases in out-of-pocket medical expenses occurring after retirement. Second, comparing pre-retirement expectations with post-retirement realizations of work, I find that when realizations diverged from expectations (in about 45 percent of cases), individuals were more likely to have been too pessimistic about retirement (expecting to work but not in fact working) rather than too optimistic (expecting not to work but in fact working). Third, among those who were too pessimistic, the evidence points to the arrival of *positive* news about financial position after retirement (though not driven by the stock market gains) and/or negative news about health. These results complement evidence from studies of consumption behavior that suggest actual retirement turns out better than expected for most people (Forni, 1999, Hurd and Rohwedder, 2003, Mastrogiacomo, 2003). Fourth, among the small minority who were too optimistic, the evidence points to the arrival of negative news about preferences for retirement leisure, and not negative news about financial position; it appears that many individuals found retirement to be less satisfying than expected, especially with respect to being productive. One possible exception is that loss of health insurance coverage may have prompted some to return to work, although it is likely that such losses were anticipated prior to retirement.

For most people, unretirement appears to represent an alternative retirement path, similar to partial retirement. The jobs held by unretirees share many of the same characteristics as the bridge jobs held by partial retirees, and there are few notable differences in the determinants of partial retirement and unretirement.

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Data Appendix

Sample Definition

I use the longitudinal structure of the HRS to carefully track and date respondents' transitions in and out of the labor force over time. My analysis sample is composed of members of the initial HRS cohort, who were first interviewed in 1992 when they were between the ages of 51 and 61, and their spouses. Respondents are re-interviewed every two years; therefore the first six waves yield data over the period 1992 through 2002. To be included in the sample, respondents must be present in at least the first two survey waves and working for pay (either full- or part-time) in Wave 1. To reduce the risk of contaminating the sample with individuals whose retirement processes began prior to 1992, I drop those working respondents who in Wave 1 also describe themselves as retired (either partially or fully) (2701 observations), or who later report a first retirement date that precedes their baseline interview in 1992 (301 observations). I drop 49 respondents who report retirement dates implying retirement ages younger than 50. My final sample size is 7,335 observations.

Identifying Retirement/Unretirement Transitions

Transitions between states are identified by wave-to-wave changes in respondents' employment or retirement status according to the definitions described in Section 2. When a transition is identified to have occurred between waves, the date (in months) of the transition given by the respondent is recorded. When a respondent is observed to be retired in two sequential waves, it is assumed that no unretirement spell occurred. In actuality, about five percent of retirees re-enter the labor force and exit between waves. Although strictly speaking these are unretirement spells, analysis reveals that 50 percent of them last less than six months, and 75 percent last less than one year. Perhaps more relevant than their duration is that annual

earnings in the calendar year between interviews are zero for at least half of these respondents, and less than $2,000 for 75 percent of them. The estimated prevalence of unretirement transitions would rise by about five percentage points (from 26 percent to 31 percent) if these short spells were included; however, given their somewhat trivial nature, I do not include them to avoid overstating the importance of unretirement. Perhaps most importantly, the shape of the unretirement hazard is robust to their inclusion. All results of the multinomial logit models are also robust to their inclusion, although standard errors are a bit larger in some instances, suggesting that the short spells mostly add noise rather than systematic variation.

Procedure for Imputing Missing Retirement Dates

When the respondent gave the year of retirement but not the month, I assumed the following: 1) if the individual retired in the same year as the interview, I imputed the month of retirement to be the midpoint between January 1 of that year and the ending date of the interview; 2) if the individual retired in the calendar year between the current and previous interviews, I assume the individual retired in June of the indicated year; 3) if the individual retired in the year of the previous interview (and did not report retirement at the previous interview), then I impute the month of retirement to be the midpoint between the ending date of the previous interview and December 31 of that year. Complete retirement dates for less than one percent of retired observations were constructed in this fashion.

When retired respondents failed to give either year or month of retirement, I attempted to use the date their last job ended from a different part of the survey, but valid data existed for only one observation. I also scanned later waves looking for a retirement date that fell between the interview date at which retirement was first reported and the date of the preceding interview, but

found no valid dates.[32] When neither the year of retirement nor the year the last job ended was available, I used the fact that the respondent must have retired at some point between the last survey wave (at which she reported herself to be working) and the current survey wave (at which she reports herself to be either partially or fully retired). In these cases, I chose the midpoint between the two interview dates as the imputed retirement date. Complete retirement dates for 6.2 percent of retired observations were constructed in this way.

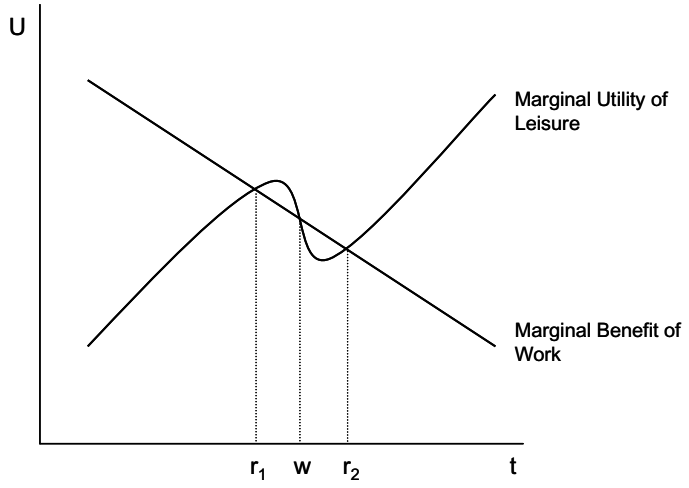
Procedure for Imputing Missing Unretirement Dates

I impute missing unretirement dates following the approach used to impute missing retirement dates. I first checked the previous wave and all later waves for a job start date that falls between the interview date at which unretirement was first reported and the prior interview (logically, unretirement must have occurred within this two year period). Valid unretirement dates were found for only 16 sample observations at this stage. For the remainder of missing dates, I imputed the unretirement date to be the midpoint between the interview date at which unretirement is first reported and the prior interview. Some 110 unretirement dates were imputed in this fashion.

[32] I accept dates from later waves only if they rationalize the reported labor force pattern, since a date reported in a later wave may pertain to a second retirement following a period of unretirement.

Figure 1. A Model of Retirement with Burnout and Recovery

A. Burnout and Recovery with No Uncertainty



B. Burnout and Recovery with Uncertainty

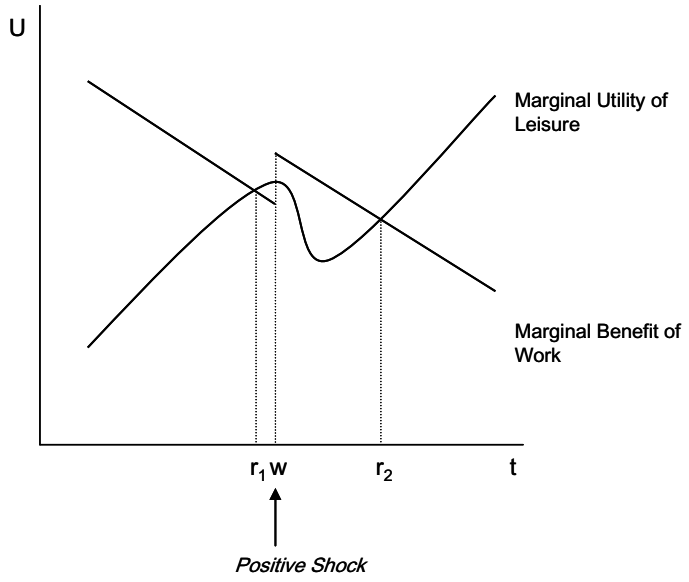


Figure 2a. Nonparametric Unretirement Hazard Rate by Gender

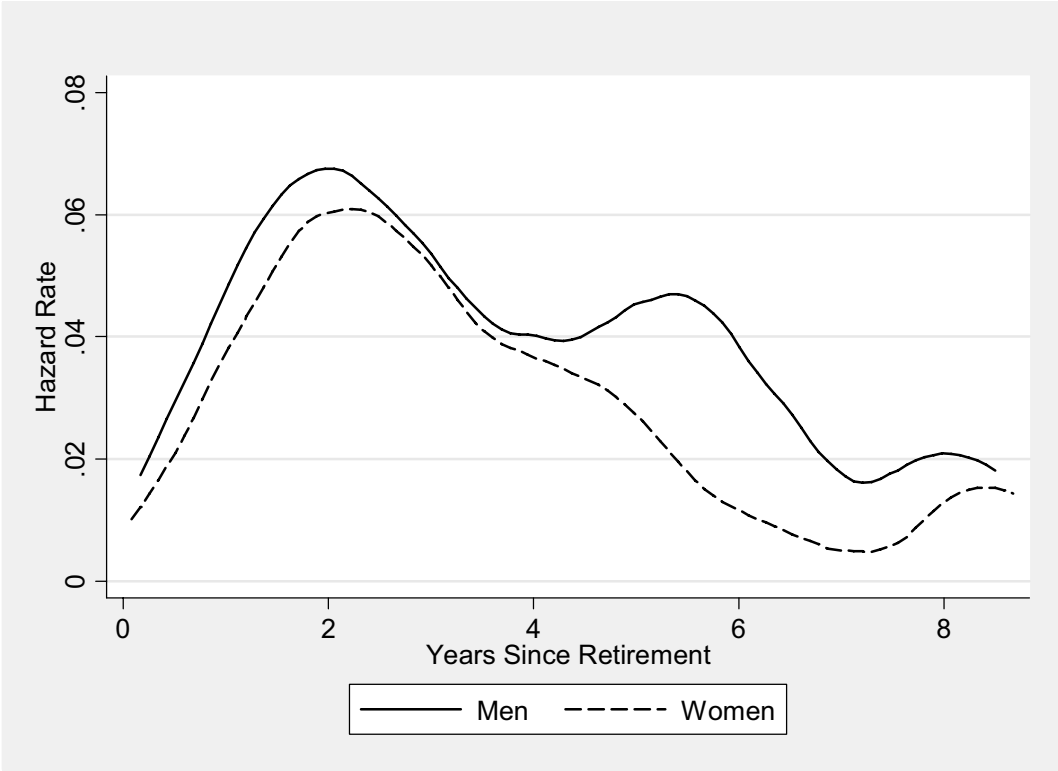


Figure 2b. Nonparametric Unretirement Hazard Rate by Age of First Retirement

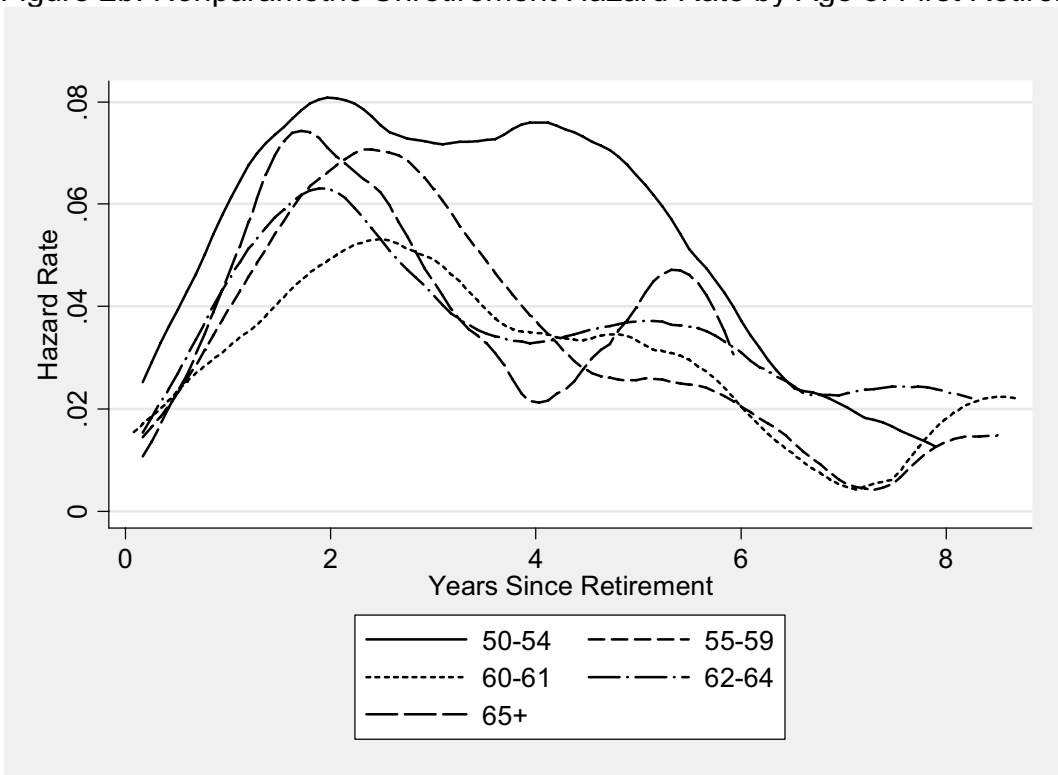


Table 1. Retirement Paths

1. Any Work --> Full Retirement --> Full Retirement	52.2
2. Any Work --> Full Retirement --> Part-Time Work	12.9
3. Any Work --> Full Retirement --> Full-Time Work	6.3
4. Any Work --> Partial Retirement --> Partial Retirement	7.7
5. Any Work --> Partial Retirement --> Full Retirement	13.7
6. Any Work --> Partial Retirement --> Full-Time Work	7.2
Number of observations	1092

Notes: Retirement path categories are mutually exclusive. Sample is all respondents observed at least 6 years after their first retirement. Any work refers to either part-time or full-time work.

Table 2. Percent Ever Returning to Work Following Retirement

	Post Retirement Observation Period			
	0+ Years	2+ Years	4+ Years	6+ Years
All	16.3	20.3	23.3	26.4
Gender				
Men	17.9	22.9	26.5	31.2
Women	14.5	17.4	19.9	21.2
Race/Ethnicity				
White	16.2	20.1	23.0	26.5
Black	16.4	20.5	25.1	27.1
Hispanic	18.5	23.6	24.6	23.8
Education				
More than 12 Years	16.4	20.4	23.5	26.5
12 Years or Less	16.2	20.2	23.2	26.4
Retirement Status				
Fully Retired	16.6	21.1	24.2	26.9
Partly Retired	15.5	18.0	20.8	25.3
Retirement Age				
53-54	37.7	40.6	39.4	34.5
55-56	27.1	28.2	28.8	29.5
57-58	18.1	19.3	21.8	25.1
59-60	14.1	16.6	19.9	23.7
61-62	13.8	17.9	20.9	23.3
63-64	14.4	20.4	22.2	27.0
65-66	13.1	17.6	19.3	24.4

Notes: Column headings denote alternate sample definitions in which respondents are observed for at least 2, 4 or 6 years after their first retirement. The sample in the column labled "0+ years" includes all retired respondents, regardless of time since retirement.

Table 3. Expectations and Realizations of Working in Retirement

	Pessimistic Expectations (Expected to Work but Didn't)	Accurate Expectations	Optimistic Expectations (Didn't Expect to Work but Did)
Percent in Category	37.3	55.2	7.5
Wealth Changes Pre-/Post Retirement			
Percent Change Net Worth (50th pctl)	4.4	4.6	0.0
Percent Change Net Worth (75th pctl)	56.8	48.4	41.4
Percent Change Stock Value (50th pctl)	0.0	0.0	0.0
Percent Change Stock Value (75th pctl)	0.7	51.5	55.9
Changes in Perceptions Pre/Post Retirement			
Ex-Ante Worried about Not Having Enough Income	59.6	50.5	35.3
Ex-Post Bothered by Not Having Enough Income	42.5	39.7	39.4
Ex-Ante Worried about Not Being Productive	35.9	32.2	20.4
Ex-Post Bothered by Not Being Productive	32.4	31.3	34.7
Health-Related Changes Pre-/Post Retirement			
Health Shock (Respondent)	26.7	19.1	19.8
Health Shock (Spouse if Married)	20.5	19.2	20.0
Lost Health Insurance Coverage	14.5	16.6	18.3

Notes: Sample is all individuals observed 2 or more years after first retirement. Work after retirement includes partial retirement and unretirement. Pre-/post retirement changes are measured using survey waves immediately before and after retirement date.

Table 4. Multinomial Logit Model of Retirement Path Choice (Base Category=Full Retirement)

	Model 1		Model 2	
	Partial Retirement	Unretirement	Partial Retirement	Unretirement
Demographics & Health (Pre-Retirement)				
Retirement Age-62	0.022	-0.065	0.040	-0.068
	(0.030)	(0.034)	(0.031)	(0.035)
Retirement Age>=62	-0.338	0.157	-0.349	0.195
	(0.194)	(0.227)	(0.202)	(0.229)
Retirement Age-62 x Retirement Age>=62	-0.089	0.027	-0.108	0.028
	(0.097)	(0.108)	(0.101)	(0.109)
Male	0.385	0.341	0.372	0.348
	(0.142)	(0.165)	(0.148)	(0.167)
Black	-0.400	0.403	-0.347	0.421
	(0.210)	(0.202)	(0.213)	(0.208)
Hispanic	-0.171	0.140	-0.230	0.086
	(0.294)	(0.325)	(0.300)	(0.334)
Other	-0.423	-0.310	-0.585	-0.332
	(0.474)	(0.482)	(0.535)	(0.488)
Married	0.210	-0.020	0.230	-0.002
	(0.172)	(0.201)	(0.180)	(0.206)
Education <=12 years	-0.250	0.102	-0.193	0.098
	(0.147)	(0.172)	(0.151)	(0.172)
Fair or Poor Health (Self-Reported)	-0.532	-0.833	-0.276	-0.836
	(0.207)	(0.226)	(0.222)	(0.246)
Number of Health Conditions	-0.036	-0.060	-0.070	-0.084
	(0.063)	(0.073)	(0.065)	(0.076)
Retirement Resources (Pre-Retirement)				
Log Income	0.010	0.091	0.208	0.081
	(0.043)	(0.059)	(0.071)	(0.080)
ASINH Net Worth	-0.035	-0.012	-0.070	-0.010
	(0.052)	(0.059)	(0.055)	(0.062)
Self-Employed	0.658	0.313	0.485	0.296
	(0.229)	(0.281)	(0.236)	(0.285)
Employer Pension	-0.537	-0.110	-0.642	-0.068
	(0.181)	(0.207)	(0.189)	(0.208)
Employer Offers Retiree Health Insurance	-0.320	-0.216	-0.291	-0.185
	(0.183)	(0.217)	(0.193)	(0.227)
Occupation (Pre-Retirement)				
Managerial/Professional Specialty	0.697	0.635	0.738	0.647
	(0.238)	(0.280)	(0.248)	(0.282)
Sales/Admin Support	0.563	0.442	0.578	0.456
	(0.236)	(0.280)	(0.246)	(0.281)
Services	0.337	0.323	0.397	0.386
	(0.265)	(0.306)	(0.278)	(0.308)
Precision Production/Craft/Repair	0.542	0.614	0.626	0.698
	(0.257)	(0.291)	(0.268)	(0.295)
Retirement Planning (Pre-Retirement)				
Short Planning Horizon	0.052	0.147	0.050	0.126
	(0.157)	(0.172)	(0.166)	(0.174)
Plans to Keep Working in Retirement	0.955	1.004	0.936	0.998
	(0.156)	(0.186)	(0.160)	(0.187)
Worried About Not Having Enough Income	-0.033	0.110	0.298	0.091
	(0.140)	(0.164)	(0.168)	(0.200)
Worried About Not Being Productive	0.033	0.117	0.114	0.267
	(0.140)	(0.162)	(0.172)	(0.199)
Changes in Resources & Perceptions (Post-Retirement)				
Net Worth (Non-Housing) Drops by 25% or More			-0.069	-0.040
			(0.154)	(0.170)
Stock Value Drops by 25% or More			0.045	-0.036
			(0.189)	(0.205)
Became More Worried about Income			0.807	0.096
			(0.276)	(0.345)
Became Less Worried about Income			-0.795	-0.026
			(0.234)	(0.249)
Became More Worried about Not Being Productive			0.117	0.535
			(0.248)	(0.251)
Became Less Worried about Not Being Productive			-0.320	-0.119
			(0.270)	(0.298)
Health Shock			-0.634	-0.722
			(0.168)	(0.190)
OOP Medical Expenses Jump by 25%+			-0.006	0.081
			(0.129)	(0.146)
Lost Health Insurance			0.053	0.159
			(0.189)	(0.206)
Pseudo R-Squared	0.086		0.119	
Number of Observations	1896		1896	

Notes: Sample is all individuals observed at least 4 years after first retirement. Multinomial logit coefficients are reported. Standard errors in parentheses and clustered at household level. Each model also includes an intercept, retirement calendar year dummies, and 6 dummy variables for missing values on variables in Model 1, and 9 such dummies in Model 2 (most statistically insignificant). ASINH is the inverse hyperbolic sine function, such that asinh(z)=ln(z+sqrt(1+z^2)). In neither model does a generalized Hausman test reject IIA.

Table 5. Characteristics of Pre- and Post-Retirement Jobs

			Unretirement Jobs	
Job Characteristics	Pre-Retirement Jobs	Partial Retirement Jobs	Part-Time	Full-Time
Median Hourly Wage	$15.45	$10.32	$8.35	$9.00
Median Annual Earnings	$29,646	$10,681	$2,089	$7,863
Median Ratio Post-Ret./Pre-Ret. Earnings	1.0	50.2	7.6	25.7
Part-Time Job	18.1	100.0	100.0	0.0
Hours Worked per Week	40.6	19.8	18.9	42.2
Weeks Worked per Year	49.5	41.8	36.1	49.6
Self-Employed	18.7	31.6	24.0	27.8
Health Insurance	65.8	44.2	35.5	48.3
Job is Stressful	62.7	33.9	23.8	40.1
Job Requires "Lots of Physical Effort"	34.0	29.6	28.6	35.1
Job Requires Stooping/Kneeling	22.7	19.9	21.1	23.9
Job Requires Good Eyesight	89.9	86.3	82.6	91.4
Job Requires Heavy Lifting	13.6	10.2	8.0	12.6
Industry				
Ag/Forestry/Mining/Construction	10.3	12.1	12.8	18.4
Manufacturing	24.2	11.2	8.4	15.5
Wholesale/Retail	14.0	18.1	16.1	14.5
Services	51.4	58.6	62.8	51.6
Occupation				
Managerial/Professional Specialty	37.8	32.3	26.7	25.8
Sales/Admin Support	26.6	27.9	29.7	32.6
Services	11.4	16.9	15.3	13.6
Precision Production/Craft/Repair	13.1	13.0	12.7	16.6
Operators/Laborers	11.1	9.8	15.6	11.4

Notes: Occupation and industry classifications based on aggregated 3-digit 1980 U.S. Census Occupation Codes and aggregated 3-digit 1980 Census Standard Industrial Classification Codes. All dollar amounts in 2000$. "Job is Stressful" is a dummy for whether the job is stressful all or most of the time. Similarly, the job requirement variables (i.e., Physical Effort, Sooping, Eyesight, Lifting) are dummies for whether the job has the named characteristic all or most of the time.

Appendix Table 1. Descriptive Statistics of Sample

	Mean	Standard Deviation	Minimum	Maximum
Observation Period (Years)	6.6	1.6	4.0	10.3
Demographics & Health (Pre-Retirement)				
Retirement Age	59.7	3.3	51.0	67.0
Male	51.4	50.0	0.0	100.0
Black	8.6	28.0	0.0	100.0
Hispanic	4.1	19.9	0.0	100.0
Other	1.7	13.1	0.0	100.0
Married	73.3	44.2	0.0	100.0
Education <=12 years	57.0	49.5	0.0	100.0
Fair or Poor Health (Self-Reported)	0.1	0.4	0.0	1.0
Number of Health Conditions	1.2	1.1	0.0	6.0
Retirement Resources (Pre-Retirement)				
Income	$77,782	$94,528	$0	$2,998,940
Net Worth	$362,014	$616,687	-$548,070	$9,274,540
Self-Employed	12.8	33.4	0.0	100.0
Employer Pension	68.6	46.4	0.0	100.0
Employer Offers Retiree Health Insurance	72.5	44.7	0.0	100.0
Occupation (Pre-Retirement)				
Managerial/Professional Specialty	30.8	46.2	0.0	100.0
Sales/Admin Support	23.4	42.4	0.0	100.0
Services	11.1	31.4	0.0	100.0
Precision Production/Craft/Repair	11.0	31.3	0.0	100.0
Operators/Laborers	13.2	33.9	0.0	100.0
Retirement Planning (Pre-Retirement)				
Short Planning Horizon	24.0	42.7	0.0	100.0
Plans to Keep Working in Retirement	71.2	45.3	0.0	100.0
Worries About Not Having Enough Income	53.6	49.9	0.0	100.0
Worries About Not Being Productive	35.3	47.8	0.0	100.0
Changes in Resources & Perceptions (Post-Retirement)				
Net Worth (Non-Housing) Drops by 25% or More	25.5	43.6	0.0	100.0
Stock Value Drops by 25% or More	16.7	37.3	0.0	100.0
Became More Worried about Income	10.9	31.1	0.0	100.0
Became Less Worried about Income	22.5	41.8	0.0	100.0
Became More Worried about Not Being Productive	16.9	37.5	0.0	100.0
Became Less Worried about Not Being Productive	17.1	37.7	0.0	100.0
Health Shock	21.0	40.7	0.0	100.0
OOP Medical Expenses Jump by 25% or More	48.4	50.0	0.0	100.0
Lost Health Insurance	16.3	37.0	0.0	100.0
Year				
1992	4.0	19.5	0.0	100.0
1993	15.5	36.2	0.0	100.0
1994	17.7	38.2	0.0	100.0
1995	17.7	38.2	0.0	100.0
1996	17.1	37.7	0.0	100.0
1997	18.9	39.1	0.0	100.0
1998	9.2	28.9	0.0	100.0

Notes: Sample is all individuals observed at least 4 years after first retirement. All dollar amounts in 2000$.