

# Full retirement? An examination of factors that influence the decision to return to work

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## Abstract

We examine a sample of retirees who either remain fully retired or return to work in some capacity. Surprisingly, we find that those who rejoin the labor force are no less financially prepared for retirement than are their counterparts who remain retired. Instead, the factors that significantly influence the decision to return to work are the availability of health insurance, whether the initial decision to retire is freely chosen, and the degree of satisfaction with retirement. However, the factors that significantly affect the decision to return to work differ between those who wanted to retire and those who were forced into retirement. © 2006 Academy of Financial Services. All rights reserved.

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## 1. Introduction

Retirement is a significant experience in the life cycle of an individual. Recent trends that lend gravity to the financial aspects of the process are an increase in average life expectancies and a trend towards early retirement (Montalto, Yuh & Hanna, 2000), both of which imply an increase in the expected length of the individual's retirement planning horizon. In addition, there has been a shift from defined benefit to defined contribution plans (Bodie & Crane, 1999) and, therefore, a shift in savings responsibility from employer to employee. The aging of the Baby Boom generation also creates uncertainty regarding the future of the Social

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Security and Medicare systems (Fraser, Jennings & King, 2000) and, therefore, in the benefits that may be available.

Despite the weight that these trends lend to the importance of planning for retirement, research to date generally suggests that individuals' expectations of the financial demands of retirement, and consequently, their financial preparations for retirement, are uninformed and deficient (Korczyk, 2001). Consistent with these findings, empirical tests of the adequacy of individuals' financial preparation for retirement consistently document a savings shortfall (Yuh, Hanna & Montalto, 1998; Mitchell & Moore, 1998; Moore & Mitchell, 2000).

Given these results, it appears that an issue deserving of consideration is the examination of individuals' experience after they have retired. If the adequacy of financial preparation is overestimated, it may be that the shift into retirement is not a permanent move. The purpose of this study is to examine the experience of individuals after the decision to fully retire has been made. Our central research questions are: is the transition to full retirement permanent? If not, what factors significantly influence the likelihood of a change in retirement status?

In considering these issues, however, we recognize that retirement is more than just a shift in financial position; that it is a complex process influenced by a variety of factors. For example, in their study of determinants of the age of retirement, Montalto et al. (2000) find that in addition to financial preparation, demographic variables have significant influence. Quinn (2001) and McCarthy (2002) each suggest that quality-of-life issues are playing an increasingly more important role in the retirement planning process. Feldman (1994) notes that permanent retirement is an adjustment process involving elements of not only financial well-being, but physiological and psychological well-being too.

Using data from the 1994, 1996, 1998, and 2000 surveys of the *Health and Retirement Study* (HRS), the variables we examine therefore include not only asset accumulation and income factors, but also demographics and unique data regarding the nature of both the retirement decision and the retirement experience. Interestingly, we find that for our sample of retirees, those who rejoin the labor force in some capacity are no less financially prepared for retirement than are their counterparts who remain retired. Instead, the factors that significantly influence the decision to return to work are the availability of health insurance, whether the initial decision to retire is freely chosen, and the degree of satisfaction with the retirement experience.

The remainder of the paper is organized as follows: Section 2 contains a review of the literature. Section 3 describes our data sample, our methodology, the financial and non-financial variables we measure, and our predicted influences of each on the decision to remain fully retired or return to work. Section 4 reviews our empirical results and Section 5 concludes the paper.

## **2. Literature review**

### *2.1. Retirement adequacy studies*

There is a long and rich history of the development of the life-cycle hypothesis of savings formulated by Ando and Modigliani (1963, 1964). In the decades following these funda-

mental works, there has developed a body of literature of how individuals save and why their consumption patterns vary over their lifetimes.<sup>1</sup> In particular, retirement adequacy studies are often based on a life-cycle model and the assumption that individuals prefer to smooth consumption over their lifetimes.<sup>2</sup> Given this premise, these studies empirically project the level of accumulated resources, estimate post-retirement consumption, and then determine the adequacy of these resources in financing consumption needs.

Results suggest that before retirement, individuals are not financially prepared. Yuh et al. (1998) find that, based on mean (pessimistic) lognormal asset growth projections and current contribution rates, only 42% of households are adequately preparing for retirement. Mitchell and Moore (1998) estimate savings shortfalls and prescribed savings rates for married couples, single males, and single females. In each case, they find significant shortfalls in wealth accumulation and argue that savings rates substantially higher than documented rates are necessary for the median household to meet retirement consumption needs. In a related study, Moore and Mitchell (2000) project that, for retirement at age 62, the median household would have to save an additional 16% of earnings to maintain pre-retirement consumption levels during the retirement period. When dividing their sample into deciles based on initial wealth, this rate rises significantly (to a range of 24%–38%) for the four lowest deciles.

Banks and Blundell (1998) argue that a fall in consumption as the head of the household retires is not fully explained by a life-cycle model that assumes a decumulation in retirement. They conclude that the retirement savings puzzle, or the reason why households do not save more over their life-cycle, can be explained by an unanticipated shock around the time of retirement. The shock is an overestimation of future pension benefits, with the majority of individuals discovering their actual retirement income is lower than expected.

## 2.2. *Other studies*

In their study of the expected age of retirement, Montalto et al. (2000) find that levels of financial assets, non-financial assets, and private pension funds have a significant and negative effect on the planned age of retirement. However, they also find a significant and negative influence of minority races on expected retirement age, and positive and significant effects from longer life expectancy and having a college degree. Dwyer and Mitchell (1999) find that poor health significantly influences the expected age of retirement, and the economic implication is stronger than that of the financial measures they test.

Among their samples of aging male workers, Rogowski and Karoly (2000) show that, in addition to pension benefits, access to post-retirement health insurance has a positive and significant influence on the probability of retirement, while Berkovec and Stern (1991) show that bad health, age, and a lack of education have positive and significant effects. Finally, Feldman (1994) provides an overview of the retirement-decision literature across the disciplines of economics, gerontology, and management. He suggests that age, gender, marital status, race, wages, health, job performance, and the individual's attitude towards retirement are factors that significantly influence the retirement process.

In summary, common themes in the retirement literature are that financial shortfalls often accompany retirement and other non-financial factors significantly affect the retirement process. Based on these findings, we use a probit analysis to examine the influence of both

financial and non-financial factors on the probability of exiting full retirement and rejoining the labor force in some capacity. Our unique sample of individuals who have fully retired and the model we estimate are more fully described below.

### 3. Data and methodology

#### 3.1. Data sample

As noted above, our sample is derived from the survey results of the HRS database. The survey was first administered in 1992 to approximately 7600 households in which at least one household member was between the ages of 51 and 61. The survey has since been re-administered on a biennial basis.

In this study, we form our sample by identifying all households whose designated “financial respondent” is self-categorized as “completely retired” as of the 1994 survey. This results in a sample of 283 households.<sup>3</sup> From that initial selection, our Remain Retired sample is then comprised of the households in which the financial respondent maintains his or her “completely retired” status at the time of the 1996, 1998, and 2000 surveys. In contrast, the Rejoin the Labor Force sample reflects those households in which the financial respondent’s status changes to either “partially retired” or “non-retired” at some time during the subsequent surveys. Of the full sample of retired households, the financial respondents of 59% (168 households) remain completely retired throughout the sample period. More notably, 41% of the sampled retirees (115 households) return to work in some capacity over our sample period.<sup>4</sup>

#### 3.2. Methodology

##### 3.2.1. Model development

Costa (1998) suggests that when individuals make a choice between retirement and labor force participation, they will consider the well-being derived from each choice and select the option that optimizes their utility. We suggest that the same economics can be applied to the choice between remaining retired and rejoining the labor force after retiring. Well-being, or utility, when remaining retired can be written as

$$U_r(I_r; F_r; Z) \tag{1}$$

and utility when rejoining the labor force as

$$U_w(I_w; F_w; Z), \tag{2}$$

where  $I_r$  ( $I_w$ ) is income available in retirement (when rejoining the labor force) and  $F_r$  ( $F_w$ ) represents the financial variables of those who remain retired (rejoin the labor force).  $Z$  is a vector of demographic variables likely to affect utility.

Following the methodology of Costa (1998), we assume that the utility functions are linear in their arguments and differences in individual tastes are random and normally distributed. The individual can then be considered to be evaluating the following decision function:

$$D^* = U_r(I_r; F_r; Z) - U_w(I_w; F_w; Z) = X'\beta + \varepsilon, \quad (3)$$

where  $X$  is a vector containing variables that affect the well-being of each option,  $\beta$  is a vector of parameters, and  $\varepsilon$  is a standard normal error term. While the value of  $D^*$  is unobservable, a discrete indicator for the decision to remain retired is observed, and given by

$$D = 0 \text{ if } D^* < 0 \text{ and } 1 \text{ otherwise}, \quad (4)$$

where 1 represents remaining retired and 0 returning to work. Using the indicator function for the decision to remain retired  $D$ , we empirically estimate the effect of income, financial, and demographic variables on the probability of remaining retired by means of a probit model,

$$\text{prob}(D = 1) = \text{prob}(\varepsilon < X'\beta) = \Phi(X'\beta), \quad (5)$$

where  $\Phi(X'\beta)$  is a standard normal cumulative distribution function.

Based on the literature review, we expect those who are better prepared financially are more likely to remain retired, but we expect demographic variables to have significant influence as well. A detailed description of the variables we estimate and the expected influence of each follows.

### 3.2.2. Variable descriptions and predictions

Appendix 1 defines each demographic and financial variable estimated in our probit model and reflects the expected direction of each variable's influence on the decision to remain retired.

*Demographic variables.* The variable AGE reflects the retiree's age in years, while MALE and MARRY assume values of one if the retiree is male or married, respectively, and are otherwise zero. Based on the findings of prior research (see Williamson & McNamara, 2001; Mitchell & Moore, 1998; and Lahey & Kim, 2002), we expect older individuals, males, and married individuals to be more likely to remain retired, and the coefficient estimates of AGE, MALE, and MARRY to each have a positive sign.

EDUC is a step-wise variable, assuming a higher value for higher levels of education. Recall that Montalto et al. (2000) find that having a college degree has a positive and significant influence on the expected age of retirement, whereas Berkovec and Stern (1991) show that a lack of education has a positive and significant effect on the probability of retirement. These results would suggest that more highly educated individuals may be more likely to return to work or that the expected sign of the coefficient estimate of EDUC is negative.

Our occupation variable (OCCUP) assumes a value of one if the financial respondent describes his or her pre-retirement occupation in the 1992 HRS survey as involving managerial or professional operations, and is otherwise zero. The literature addressing the influence of an individual's occupation on the retirement experience is relatively limited. Montalto et al. (2000) find no significant effect of their occupation control variables on the expected age of retirement. However, Feldman (1994) proposes that individuals are more

likely to retire early from primary labor market positions, or traditional positions of full-time employment, than from secondary positions, or positions of a transitory nature. This may suggest that individuals holding professional positions before retirement are more likely to remain retired, or that the sign of the coefficient estimate of OCCUP will be positive.

The respondent's self-reported health status (HEALTH) is divided into five categories in the HRS survey, with a higher number indicating better health. Dwyer and Mitchell (1999) find that poor health has a negative and significant effect on the expected age of retirement, whereas Berkovec and Stern (1991) show that bad health has a positive and significant effect on the probability of retirement. Based on these findings, we expect the sign of HEALTH to be negative since individuals in better health may be less likely to remain retired.

In connection with the health variable, the existence or lack of health insurance coverage may also significantly influence the choice to remain retired. For example, Dwyer and Mitchell (1999) find that of the economic variables they tested, their health insurance measure had the most significant effect on the expected retirement age, and suggests an earlier retirement in the presence of health insurance coverage. Similarly, Blau and Gilleskie (2001) find that the availability of employer-provided health insurance increases the rate of exit from employment, while Rogowski and Karoly (2000) show that access to post-retirement health insurance positively influences the probability of retirement. We include INSURE to indicate whether or not the household has employer-sponsored health insurance and expect insurance coverage to positively influence the ability to remain retired.

Raising children may place significant demands on household finances and potentially influence the retirement savings rate throughout the respondent's life. Therefore, we expect those with children (CHILD) to be less likely to remain retired. Similarly, we include an indicator of financial support to dependents (SUPPORT) to capture potentially significant demands on current financial resources that may otherwise be used for retirement. We expect those with support demands will also be less likely to remain retired.

Finally, the HRS database provides information regarding the nature of the retirement decision and the retiree's level of satisfaction with the retirement experience. The variable FORCE assumes a value of one if the financial respondent indicates that he or she was forced into retirement and a value of zero if retirement was freely chosen. SATISFY assumes a value of one if the respondent indicates he/she is very satisfied with retirement, and is zero if the respondent is not at all satisfied. We expect those who are forced to retire and those who are not satisfied with retirement to be more likely to return to work.

*Financial variables.* HRS survey respondents report the estimated total current value of each asset and the actual dollar value of income received in each survey year. All values are reported at the household level and, where necessary, we annualize values reported as a monthly figure.

FIN is total household financial assets, and includes the balances of all fixed-income securities, equity holdings, Individual Retirement Accounts (IRAs) and Keogh plans.<sup>5</sup> COMM includes the equity value of any family business, farm, and real estate holdings excluding the primary residence. As an indicator of the financial preparation for retirement, we expect FIN to positively influence the decision to remain retired. However, we expect the opposite to be true of COMM. This is because COMM reflects assets that are relatively

illiquid and that may be difficult to convert to resources to be used for consumption purposes. It may also be that retirement from a sole proprietorship (as compared to other business forms), may be relatively more complex, making a final move into full retirement less likely to occur.

The dollar mortgage value on the respondent's primary residence represents a potentially significant demand on current financial resources. We therefore expect the MORTGAGE variable to negatively impact the ability to remain retired. INCOME is the sum of income streams from labor-related earnings, retirement pensions, capital income, and Social Security benefits for the household.<sup>6</sup> We expect the higher the level of income, the greater the probability of remaining retired. Therefore, the coefficient estimate of INCOME is expected to be positive.

## 4. Empirical results

### 4.1. Descriptive statistics

In Panel A of Table 1, we present the frequency distribution of responses to the HRS survey questions regarding the nature of the retirement decision and the level of satisfaction with the retirement experience. For the 168 households in which the financial respondent remains retired, approximately 64% of the individuals choose retirement, while 27% indicate the decision was forced upon them. For the 115 respondents that return to work in some capacity, less than half (44%) indicate a choice and 45% indicate they had been forced to retire. Additionally, a greater percentage of those who remain retired (60%) indicate that they are very satisfied with retirement, while only 49% of those who return to work share this opinion.

Panel B of Table 1 shows the summary means of the remaining demographic variables for each sample. Note that the mean respondent age in each group is approximately 60 years, indicating a tendency among our sample to retire before the availability of full Social Security benefits. The results for MALE indicate that a greater percentage of the respondents who remain retired are male, while the means of HEALTH suggest that each sample is in fair health, on average, with no statistically significant difference between the two.

The mean of the INSUR variable is significantly higher for respondents who remain retired, indicating that, on average, a greater percentage of these retirees have employer-sponsored health insurance. Additionally, a lower percentage of those who remain retired have children and fewer are supporting dependents. Finally, on average, fewer respondents who remain retired have been forced to retire (FORCE), and those who remain retired are significantly more satisfied with retirement (SATISFY). The difference in sample means for each of these variables is statistically significant at a 1% level.

In summary, the results of Table 1 show that the Remain Retired and Rejoin the Labor Force samples significantly differ. While each has opted for early retirement, those that return to work tend to be female, to lack employer-sponsored health insurance, and to have children and be financially supporting dependents. In addition, respondents who return to

Table 1 Descriptive statistics of retirement survey questions and sample demographics

Variable	Remain retired	Rejoin labor force
	Frequency (%)	Frequency (%)
<i>N</i>	168	115
Panel A: retirement		
Your retirement was		
Wanted	64.3	43.9
Forced	26.8	44.7
A combination	8.9	11.4
Your retirement has turned out to be		
Very satisfying	59.5	49.1
Moderately satisfying	31.5	36.8
Not at all satisfying	8.9	14.0
Panel B		
	Mean	Mean
AGE	60.99	60.03* (0.072)
MALE	0.67	0.52*** (0.014)
MARRY	0.70	0.69 (0.783)
EDUC	2.67	2.57 (0.423)
OCCUP	0.48	0.40 (0.240)
HEALTH	3.20	3.17 (0.880)
INSURE	0.64	0.47*** (0.004)
CHILD	0.83	0.91** (0.043)
SUPPORT	0.17	0.28** (0.030)
FORCE	0.36	0.56*** (0.001)
SATISFY	0.85	0.67*** (0.001)

*Note:* Data is from the HRS database. The full sample includes those households in which the financial respondent is retired at the time of the 1994 survey. The Remain Retired sample reflects those households in which the financial respondent has remained retired at the time of the 1996, 1998, and 2000 surveys. The Rejoin the Labor Force sample reflects those households in which the financial respondent's self-reported status changes to "partially retired" or "not retired" at some time during the 1996, 1998, and 2000 surveys. Panel A contains the (%) frequency of responses to 1994 survey questions regarding retirement and to a 1992 survey question regarding the nature of the financial respondent's occupation before retirement. Percentages may not sum to 100% because of rounding errors. Panel B reflects the mean of all demographic variables as reported in the 1994 survey and as defined in Appendix 1. *p*-value results indicating the statistical significance of the difference in mean values between the samples are in parentheses.

\*\*\*, \*\*, and \* indicate the means are statistically different at the 1%, 5%, and 10% level of significance, respectively.

work are more likely to have had retirement forced upon them and are significantly less satisfied with the retirement experience.

With respect to financial factors, Table 2 shows summary statistics for the asset allocation and income variables of both samples. For the asset variables, BOND is the current value of the household's bond holdings, while LIQUID is the current value of all certificates of deposit, checking account balances, savings account balances and bond holdings combined. ANN is the current value of all IRAs and Keogh plans, and STOCK is the household's total market value of all equity holdings. As previously noted, FIN is the sum of LIQUID, ANN, and STOCK, and COMM is as previously defined. Non-housing equity (NHEQU) is the sum of FIN and COMM, while HEQU is the equity value of the household's primary residence,

Table 2 Descriptive statistics of financial factors

Variable	Panel A: 1994		Panel B: 2000	
	Remain retired	Rejoin labor force	Remain retired	Rejoin labor force
<i>N</i>	168	115	168	115
Household assets	Level		Change	
BOND	\$6487	\$9,603 (0.579)	\$–1505	\$–1347 (0.978)
LIQUID	27,912	40,421 (0.156)	–720	–5506 (0.571)
ANN	42,060	36,219 (0.593)	12,764	18,553 (0.687)
STOCK	34,050	81,244 (0.241)	3,937	–12,868 (0.720)
FIN	\$110,509	\$167,487 (0.248)	\$14,476	\$–1167 (0.779)
COMM	47,878	106,028* (0.090)	1,751	98,054 (0.201)
NHEQU	\$158,387	\$273,515* (0.084)	\$16,227	\$96,886 (0.430)
HEQU	76,219	64,112 (0.184)	10,079	14,081 (0.666)
TOTNW	\$234,606	\$337,627 (0.148)	\$26,306	\$110,967 (0.424)
MORTGAGE	\$16,180	\$18,212 (0.671)	–2324	–2509 (0.971)
TOTDEBT	17,811	19,773 (0.684)	–1346	2884 (0.515)
Household income	Level		Change	
EARN	\$22,588 (0.595)	\$22,083 (0.902)	\$–19,583	\$–9856* (0.063)
RETINC	15,323 (0.595)	13,448 (0.654)	–279	–4826 (0.345)
SOCIAL	5,505 (0.595)	5137 (0.586)	4539	3894 (0.593)
CAPITAL	2827 (0.595)	4005 (0.357)	–1670	–506 (0.535)
INCOME	\$46,244 (0.595)	\$44,673 (0.793)	\$–16,994	\$–11,293 (0.431)

*Note:* Data is from the HRS database. The full sample includes those households in which the financial respondent is retired at the time of the 1994 survey. The Remain Retired sample reflects those households in which the financial respondent has remained retired at the time of the 1996, 1998, and 2000 surveys. The Rejoin the Labor Force sample reflects those households in which the financial respondent's self-reported status changes to "partially retired" or "not retired" at some time during the 1996, 1998, and 2000 surveys. Panel A shows the mean level of each variable in 1994 and Panel B shows the mean change in each variable from the 1994 survey to the 2000 survey. BOND (STOCK) reflects bond (stock) holdings; LIQUID reflects checking and saving account balances, and CD and bond holdings. ANN reflects IRA and Keogh plans. NHEQU = FIN + COMM, HEQU is the equity value of the household's primary residence, and TOTNW = NHEQU + HEQU, or the household's total net worth. All remaining variables are defined in Appendix 1. *p*-value results indicating the statistical significance of the difference in mean values between the samples are in parentheses.

\* indicates the means of the remain retired and rejoin the labor force samples are statistically different at the 10% level of significance.

and the household's total net worth (TOTNW) is the sum of NHEQU and HEQU. MORTGAGE is as previously defined, and TOTDEBT reflects debt from mortgages, vehicles, credit cards and all other debt sources.

For the income variables, EARN is the total annual employment-related earnings generated by the household and RETINC is annual income generated from retirement pensions. SOCIAL accounts for annual Social Security income for the household, and may include any combination of retirement benefits and/or disability benefits collected. CAPITAL includes all sources of capital income (e.g., dividends, interest income, etc.), whereas INCOME is the sum of all four income streams.

Panel A of Table 2 reflects the mean values of the financial variables for each sample as of the 1994 HRS survey. Most notable among the results is that with the exception of the

mean values of COMM (and, hence, NHEQ), the average level of asset accumulation and income streams do not statistically differ between the two groups. This would seem to suggest that our sample respondents who remain retired are no more financially prepared for retirement than are their counterparts who return to work.

Although the financial variables of the samples do not significantly differ at the point of initial retirement, it may be that a change in financial position over time significantly influences the decision to remain retired or rejoin the labor force. To that end, Panel B of Table 2 also reflects the mean change in each variable between the 1994 and 2000 surveys for each sample.<sup>7</sup> Each sample experiences an average increase in total net worth, and an average decline in total income. However, only the change in employment-generated earnings is significantly different between the two samples, with the smaller average decline for the Rejoin the Labor Force sample likely reflecting earnings gained from returning to work.

The general lack of statistically significant differences in the financial measures of the two groups may be because of homogeneity of the sample. That is, the initial sample is comprised of individuals of similar age and who have all retired within a two-year period. The lack of statistically significant differences may also be because of the large amount of variability and, therefore, large standard errors, associated with several of the financial variables (e.g., STOCK, FIN, and COMM). Additionally, as we previously noted, 85 of the 115 retirees who rejoin the labor force do so on a partial basis only. Therefore, it may be that the incremental effects of returning to work are not substantial enough to alter the majority of the financial variables we measure.<sup>8</sup>

#### 4.2. *Probit results*

In our regression analysis, we empirically estimate the probability model presented in Eq. (5) using the variables as defined in Appendix 1 and as measured in the 1994 HRS survey. We then re-estimate the model using intertemporal changes in the financial variables between the 1994 and 2000 surveys to determine if a change in financial position significantly influences the decision to remain retired or rejoin the labor force.<sup>9</sup> The results are reported in Table 3.

In estimating the model using the 1994 data, the estimated coefficient of INSURE is positive and significant at the 10% level. The result suggests that respondents with employer-sponsored health insurance are more likely to remain retired and is consistent with the findings of Dwyer and Mitchell (1999), Blau and Gilleskie (2001), and Rogowski and Karoly (2000). The significant result for the FORCE variable implies that respondents who are initially forced to retire are less likely to remain retired, while the SATISFY results indicate that those who are satisfied with retirement are more likely to remain retired.

Among the financial variables tested, the coefficient estimate of MORTGAGE is negative and significant at the 5% level, suggesting that respondents with higher mortgage balances are less likely to remain retired. Additionally, the negative and significant coefficient estimate of COMM is consistent with our hypothesis that the greater the average respondent's investment in commercial assets or a family business, the greater the probability the respondent will return to work.

When estimating the model using intertemporal changes in the financial variables, the

Table 3 Probit analysis

Variable	1994		2000	
	Coefficient estimate	<i>p</i> -value	Coefficient estimate	<i>p</i> -value
<i>N</i>	174		174	
Intercept	0.6245	0.727	0.0277	0.988
Demographics				
AGE	0.0025	0.928	0.0141	0.619
MALE	−0.0010	0.997	0.0695	0.795
MARRY	0.1695	0.561	0.0291	0.918
EDUC	−0.0653	0.660	−0.1829	0.198
OCCUP	0.3634	0.199	0.4414	0.115
HEALTH	−0.1140	0.302	−0.1593	0.156
INSURE	0.3879*	0.088	0.3655	0.108
CHILD	−0.5152	0.129	−0.3653	0.252
SUPPORT	−0.4530	0.139	−0.3948	0.194
FORCE	−0.4716*	0.058	−0.5318**	0.033
SATISFY	0.7781**	0.028	0.7734**	0.023
Financials				
FIN	−0.0002	0.432		
COMM	−0.0012*	0.089		
MORTGAGE	−0.0071**	0.051		
INCOME	−0.0012	0.612		
Inter-Temporal				
ΔFIN			0.0004	0.206
ΔCOMM			−0.0001	0.662
ΔMORTGAGE			0.0115**	0.017
ΔINCOME			−0.0013	0.569

*Note:* Data is from the HRS database. The dependent variable assumes a value of one if the financial respondent is retired at the time of the 1994 survey and remains retired at the time of the 1996, 1998, and 2000 surveys. The dependent variable assumes a value of zero if the financial respondent is retired at the time of the 1994 survey, but then changes his or her self-reported status to “partially retired” or “not retired” at some time during the subsequent surveys. All demographic and level financial variables are as reported in the 1994 survey, and inter-temporal variables measure the change in each variable between the 1994 and 2000 survey. *p*-values based on the  $\chi^2$  statistic are reported. Variable definitions are as shown in Appendix 1.

\*\* and \* indicate statistical significance at the 5% and 10% level, respectively.

coefficient estimates of FORCE and SATISFY continue to be statistically significant. Among the financial variables, only the ΔMORTGAGE is statistically significant. The result suggests that the greater the increase in the mortgage balance over time, the greater the probability of remaining retired. This would be consistent with sample retirees drawing against their home equity value to supplement their retirement income stream.<sup>10</sup>

#### 4.3. Sub-sample descriptive statistics

Given the uniqueness of, and the significant results for our FORCE variable, we further divide our samples based upon the circumstances surrounding the retirement decision (i.e., retirement is forced or retirement is wanted). We do so to determine if the factors that

Table 4—Panel A: 1994 Descriptive statistics of retired sample by wanted/forced variable and by retirement status

Variable	Retirement forced		Retirement wanted	
	Remain retired	Rejoin labor force	Remain retired	Rejoin labor force
<i>N</i>	60	64	108	50
Demographics				
AGE	59.78	59.52 (0.714)	61.67	60.66 (0.205)
MALE	0.62	0.53 (0.341)	0.69	0.50**(0.018)
MARRY	0.65	0.66 (0.942)	0.73	0.72 (0.881)
EDUC	2.33	2.38 (0.841)	2.86	2.78 (0.644)
OCCUP	0.40	0.38 (0.853)	0.52	0.41 (0.258)
HEALTH	2.53	2.72 (0.417)	3.56	3.72 (0.364)
INSURE	0.55	0.38**(0.051)	0.69	0.58 (0.160)
CHILD	0.77	0.89*(0.072)	0.87	0.94 (0.143)
SUPPORT	0.18	0.27 (0.277)	0.16	0.30**(0.038)
SATISFY	0.64	0.51 (0.171)	0.98	0.88**(0.022)

*Note:* Data is from the HRS database. The full sample includes those households in which the financial respondent is retired at the time of the 1994 survey, and the Retirement Forced (Wanted) sample reflects households for which the FORCE variable assumes a value of one (zero) in the 1994 survey. The Remain Retired sample reflects those households in which the financial respondent has remained retired at the time of the 1996, 1998, and 2000 surveys. The Rejoin the Labor Force sample reflects those households in which the financial respondent's self-reported status changes to "partially retired" or "not retired" at some time during the 1996, 1998, and 2000 surveys. Panel A shows the mean level of each demographic variable in 1994. Panel B shows the mean level of each financial variable in 1994 and the change in each variable from the 1994 survey to the 2000 survey. BOND (STOCK) reflects bond (stock) holdings; LIQUID reflects checking and saving account balances, and CD and bond holdings. ANN reflects IRA and Keogh plans. NHEQU = FIN + COMM, HEQU is the equity value of the household's primary residence, and TOTNW = NHEQU + HEQU, or the household's total net worth. All remaining variables are defined in Appendix 1. *p*-value results indicating the statistical significance of the difference in mean values between the samples are in parentheses.

\*\* and \* indicate the means of the remain retired and rejoin the labor force samples are statistically different at the 5% and 10% level of significance, respectively.

significantly influence the decision to remain retired or return to work differ between the two subsamples. We first present descriptive statistics for each subsample in Table 4.

For the demographic variables, Panel A shows that, for financial respondents who are forced to retire, on average, a smaller percentage of those who rejoin the labor force have employer-sponsored health insurance and a larger percentage have children. For those respondents who wanted to retire, a larger percentage of those who rejoin the labor force are female and are financially supporting dependents. Additionally, among those who want to retire, those who remain retired are more satisfied with the retirement experience, on average.

For each subsample, Panel B of Table 4 reports the mean values of the financial variables as of the 1994 survey and the mean change in each variable between the 1994 and 2000 surveys, respectively. The results of Panel B show that for the sample of respondents who are forced to retire, there is effectively no significant difference in the financial position of those who remain retired and those who rejoin the labor force, nor is there a significant difference in the change in financial variables for the two groups. Similar conclusions may be drawn for the sample of respondents who want to retire.

Table 4—Panel B Descriptive statistics by wanted/forced variable and by retirement status

Variable	Retirement forced				Retirement wanted			
	1994		2000		1994		2000	
	Remain retired	Rejoin labor force	Remain retired	Rejoin labor force	Remain retired	Rejoin labor force	Remain retired	Rejoin labor force
N	60	64	60	64	108	50	108	50
Household assets		Level		Change		Level		Change
BOND	\$5218	\$6417 (0.765)	\$-2552	\$1224 (0.607)	\$7193	\$13,874 (0.553)	\$-924	\$-5004 (0.574)
LIQUID	19,519	39,005 (0.168)	12,735	-4398 (0.159)	32,574	39,842 (0.429)	-8195	-6033 (0.860)
ANN	28,240	21,259 (0.490)	24,252	6803 (0.336)	49,737	54,931 (0.804)	6381	32,724 (0.336)
STOCK	17,529	103,806 (0.221)	7505	-43,227 (0.542)	43,229	52,790 (0.657)	1956	26,934 (0.164)
FIN	\$70,505	\$170,487 (0.214)	\$41,941	\$-39,599 (0.390)	\$132,733	\$161,437 (0.549)	\$-782	\$48,621 (0.260)
COMM	24,045	112,023 (0.106)	22,787	169,228 (0.274)	61,119	100,315 (0.275)	-9935	8,851 (0.499)
NHEQU	\$94,550	\$282,510* (0.087)	\$64,728	\$129,630 (0.719)	\$193,852	\$261,752 (0.266)	\$-10,717	\$57,472 (0.176)
HEQU	60,970	62,277 (0.920)	-4953	3384 (0.489)	84,691	64,443 (0.122)	18,430	23,353 (0.655)
TOTNW	\$155,520	\$344,786 (0.106)	\$59,774	\$133,014 (0.695)	\$278,543	\$326,195 (0.482)	\$7712	\$80,825 (0.161)
MORTGAGE	13,449	17,711 (0.481)	3211	-1825 (0.403)	17,703	18,919 (0.854)	-5398	-3135 (0.785)
TOTDEBT	15,716	18,938 (0.601)	5819	-1442 (0.346)	18,975	20,936 (0.770)	-5326	8,778 (0.230)
Household income		Change		Change				
EARN	\$16,946	\$18,963 (0.750)	\$-15,111	\$-4597 (0.217)	\$125,722	\$24,810 (0.869)	\$-22,068	\$-16,239 (0.306)
RETNIC	7248	13,032 (0.298)	529	-6241 (0.182)	19,810	14,250 (0.244)	-728	-3110 (0.709)
SOCIAL	5172	5510 (0.742)	5527	3746 (0.371)	5690	4761 (0.326)	3989	3907 (0.950)
CAPITAL	990	3492** (0.017)	-117	-1727* (0.092)	3,848	4,722 (0.712)	-2534	1027 (0.378)
INCOME	\$30,356	\$40,997 (0.220)	\$-9171	\$-8819 (0.971)	\$55,070	\$48,545 (0.395)	\$-21,340	\$-14,415 (0.441)

Note: Data is from the HRS database. The full sample is households in which the financial respondent is retired as of the 1994 survey. The Retirement Forced (Wanted) sample is households for which the FORCE variable assumes a value of one (zero) in 1994. The Remain Retired sample reflects financial respondents who have remained retired in the 1996, 1998, and 2000 surveys. The Rejoin the Labor Force sample reflects financial respondents whose self-reported status changes to “partially retired” or “not retired” at the 1996, 1998, or 2000 survey. Panel B shows the mean level of each financial variable in 1994 and the change in each variable from the 1994 survey to the 2000 survey. BOND (STOCK) reflects bond (stock) holdings; LIQUID reflects checking and saving account balances, and CD and bond holdings. ANN reflects IRA and Keogh plans. NHEQU = FIN + COMM, HEQU is the equity value of the household’s primary residence, and TOTNW = NHEQU + HEQU, or the household’s total net worth. All remaining variables are defined in Appendix 1. *p*-value results indicating the statistical significance of the difference in mean values between the samples are in parentheses.

\*\* and \* indicate that the means of the remain retired and rejoin the labor force samples are statistically different at the 5% and 10% level of significance, respectively.

In summary, the descriptive statistics for the forced and wanted subsamples in Table 4 are similar to those of the full sample in Table 2 in that the Remain Retired and Rejoin the Labor Force samples are homogenous in their financial positions, but vary in their demographics. For the forced retirement sample, employer-sponsored health insurance appears to be a key variable of difference between those who remain retired and those who do not. Among those who want retirement, differences between those who remain retired and return to work lie primarily in gender, support of dependents, and satisfaction with retirement.

#### 4.4. *Sub-sample probit analysis*

As a final examination of the data, we rerun our probit analysis of the decision to remain retired or return to work, conditioned on whether or not the initial retirement decision is forced or wanted by the retiree. We present our results in Table 5.

For those who are initially forced to retire, the estimated coefficient of INSURE indicates that a lack of employer-sponsored health insurance significantly influences the decision to return to work. Additionally, the negative sign of the MORTGAGE coefficient estimate indicates that, on average, the higher the mortgage on the primary residence, the greater the probability the respondent returns to work. When inter-temporal changes are incorporated into the model, the significant result for INSURE remains. The positive coefficient estimate of the  $\Delta$ MORTGAGE is significant at the 5% level, and is consistent with the findings for the full sample reported in Table 3. The  $\Delta$ FINANCIAL coefficient estimate is also significant at the 5% level, and suggests that, despite retirement being forced on the respondent, a higher accumulation of financial assets positively influences the likelihood that the average respondent will remain retired.

For those who want to retire, the financial demand of supporting dependents (SUPPORT) significantly influences the decision to return to work. However, satisfaction with retirement (SATISFY), significantly influences the decision to remain retired. Finally, the coefficient estimate of OCCUP is positive and significant, suggesting that those who held a professional position before retirement are more likely to remain retired. When intertemporal changes are introduced into the model, the results are consistent.<sup>11</sup>

In summary, the results suggest that the type of factors that are most relevant to the permanence of full retirement significantly differ depending on the conditions surrounding the initial retirement decision. For the sample of individuals whose initial retirement was forced upon them, the likelihood of remaining retired is primarily influenced by financially based factors: the availability of health insurance, the level of equity in their primary residence, and the accumulation of financial assets. However, for those who freely chose to retire, remaining retired is most influenced by less objective measures: the absence of dependents needing support, the type of job held before retirement, and the level of satisfaction with the retirement experience.

## 5. Summary and conclusions

Using the 1994, 1996, 1998, and 2000 surveys from the HRS database, we examine a sample of respondents who have fully retired at the time of the 1994 survey. Of this full

Table 5 Probit analysis for sub-samples based on the wanted/forced variable

Variable	Retirement forced		Retirement wanted	
	1994	2000	1994	2000
N	63	63	111	111
Intercept	-1.5463 (0.628)	-3.0189 (0.344)	-0.0724 (0.978)	0.0597 (0.982)
Demographics				
AGE	0.0228 (0.661)	0.0568 (0.286)	0.0008 (0.984)	-0.0055 (0.891)
MALE	-0.5362 (0.385)	-0.5743 (0.372)	0.4989 (0.142)	0.6005* (0.078)
MARRY	0.7905 (0.208)	0.7127 (0.234)	-0.1381 (0.729)	-0.2838 (0.468)
EDUC	0.1840 (0.482)	-0.1387 (0.561)	-0.2781 (0.196)	-0.3507* (0.094)
OCCUP	-0.1393 (0.801)	0.3242 (0.546)	0.7764** (0.037)	0.9088** (0.018)
HEALTH	-0.1494 (0.372)	-0.3048 (0.114)	-0.0444 (0.798)	-0.0363 (0.836)
INSURE	0.9725** (0.034)	1.2055*** (0.009)	0.1195 (0.686)	0.0523 (0.868)
CHILD	-0.4697 (0.443)	-0.5415 (0.367)	-0.4024 (0.369)	-0.3214 (0.489)
SUPPORT	-0.1308 (0.825)	-0.0491 (0.935)	-0.7995** (0.046)	-0.8598** (0.037)
SATISFY	0.8066* (0.085)	0.6221 (0.181)	1.5465** (0.050)	1.8763** (0.018)
Financials				
FIN	-0.0003 (0.548)		0.0001 (0.868)	
COMM	-0.0049 (0.341)		-0.0006 (0.513)	
MORTGAGE	-0.0113* (0.056)		-0.0051 (0.366)	
INCOME	-0.0077 (0.131)		0.0018 (0.692)	
Inter-Temporal				
ΔFIN		0.0022** (0.026)		0.0005 (0.563)
ΔCOMM		-0.0008 (0.171)		-0.0004 (0.766)
ΔMORTGAGE		0.0213** (0.033)		0.0108 (0.143)
ΔINCOME		0.0081 (0.156)		-0.0070 (0.127)

Note: Data is from the HRS database. The full sample includes those households in which the financial respondent is retired at the time of the 1994 survey, and the Retirement Forced (Wanted) sample reflects households for which the FORCE variable assumes a value of one (zero) in 1994. The dependent variable assumes a value of one if the financial respondent is retired at the time of the 1994 survey and remains retired at the time of the 1996, 1998, and 2000 surveys. The dependent variable assumes a value of zero if the financial respondent is retired at the time of the 1994 survey, but then changes his or her self-reported status to “partially retired” or “not retired” at some time during the subsequent surveys. All demographic and level financial variables are as reported in the 1994 survey, and inter-temporal variables measure the change in each variable between the 1994 and 2000 survey. Variables are defined in Appendix 1.  $p$ -values based on the  $\chi^2$  statistic are reported in parentheses.

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

sample, 59% choose to remain retired throughout the subsequent surveys, but 41% decide to rejoin the labor force in some capacity.

Interestingly, we find that the sample that remains retired and the sample that returns to work are homogenous in their financial positions. However, they significantly differ on a number of demographic aspects. Respondents who return to work are more likely to be female, to lack employer-sponsored health insurance, to have children, and to be financially supporting dependents. On average, those that rejoin the labor force are more likely to have had the initial decision to retire forced upon them and are significantly less satisfied with the retirement experience.

Our regression results suggest that having employer-sponsored health insurance, freely choosing to retire, and satisfaction with the retirement experience are the factors that significantly influence the decision to remain retired. A higher mortgage balance significantly

## Appendix 1 Description of explanatory variables

Variable	Description
AGE (+)	FR age in years
MALE (+)	FR gender
No	=0
Yes	=1
MARRY (+)	FR marital status
Single	=0
Married	=1
EDUC (-)	FR education level
Some high school or less	=1
High school degree	=2
Some college	=3
College degree or more	=4
OCCUP (+)	FR occupation
Non-professional	=0
Professional	=1
HEALTH (-)	FR health status
Very poor	=1
Poor	=2
Fair	=3
Good	=4
Excellent	=5
INSURE (+)	FR has employer-sponsored health insurance
No	=0
Yes	=1
CHILD (-)	FR has children
No	=0
Yes	=1
SUPPORT (-)	FR financially supports children &/or parents
No	=0
Yes	=1
FORCE (-)	FR retirement status
Wanted	=0
Forced	=1
SATISFY (+)	FR satisfaction with retirement
Not at all	=0
Very	=1
FIN (+)	Household financial assets—dollars Current value of certificates of deposit, checking and savings accounts, bond and equity holdings, IRAs and Keogh plans
COMM (-)	Household commercial assets—dollars Equity value of family businesses, farms, and real estate holdings excluding the primary residence
MORTGAGE (-)	Mortgage on primary residence—dollars
INCOME (+)	Total annual income—dollars Employment-related earnings, retirement pensions, capital income, and Social Security benefits

*Note:* Data is from the HRS database for the years 1994, 1996, 1998, and 2000. FR = the household's designated financial respondent. The definitions of FORCE, SATISFY, and OCCUP are based on the frequency results reported in Panel A of Table 1. OCCUP = 1 if the financial respondent describes his or her occupation as of the 1992 survey as involving managerial or professional operations, and is otherwise 0. The sign in parenthesis indicates the predicted sign of the coefficient estimates for our probit analysis of the influence of each respective variable on the probability of the financial respondent remaining retired across time.

influences the decision to return to work, but drawing on the equity value of the primary residence positively influences the ability to remain retired. However, the factors that significantly influence the decision to remain retired or to return to work differ when we consider if retirement is initially forced or wanted. For those who are initially forced to retire, employer-sponsored health insurance, the mortgage balance, and a change in the value of financial assets are significant factors in the decision. For those who initially wanted to retire, supporting dependents and satisfaction with retirement are the most significant.

In examining the retirement experience of a sample of individuals who have fully retired, the findings of our study suggest that “full retirement” may not necessarily be a permanent and complete cessation of work. Rather, it is a living process, influenced by a variety of factors, both financial and non-financial. This implies that retirement planning is not necessarily a process with an endpoint of “full retirement,” but instead, will likely continue to evolve. In particular, whether full retirement is freely chosen and whether it is a satisfying experience appear to have unique and significant implications for the permanency of retirement and, therefore, warrant particular attention in the retirement planning process.

Our study is limited by the absence of data for accumulated values in pensions and 401(k) plans, which we anticipate would make a significant contribution to our findings. Additionally, refining the study to consider the experience of retirees who rejoin the labor force on a part-time basis separately from those who return to work on a full-time basis may also prove beneficial. We leave these pursuits to future research.

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## Notes

1. For example, see Merton (1971), Bodie, Merton and Samuelson (1992), Sundaresan and Zapatero (1997), Kenc (1999), and Bodie, Detemple, Otruba and Walter (2004).
2. For a detailed development of the methodology, see Yuh et al. (1998).
3. We exclude the 1992 survey data from our study because it includes individuals who have been retired since the late 1960s and, therefore, may be anomalous. We also omit outlier households that report either non-positive income or non-positive net worth.
4. Because of movements between the status of “partially retired” and “non-retired” across the surveys, we combine the two for a tractable analysis. Of the 115 households in which the retiree returns to work in some capacity, 85 indicate the change in their retirement status is to “partially retired” at some time over the 1996, 1998, and 2000 surveys.
5. The values of individual asset types are available from the HRS and are reported in our descriptive statistics. For the purpose of our probit model, however, testing each separate asset assumes that households diversify their holdings across security classes

and that each asset type influences the decision to remain retired. To allow for the possibility that individual households utilize only one or two asset types (Waggle & Englis, 2000) or make their decision based on concentrated holdings, we aggregate the balances.

6. Although retirement pension income is available from the HRS and included in our INCOME variable, data for the accumulated value of pensions and 401(k) plans is extremely limited and is not included in the FIN measure.
7. We also measured inter-temporal changes in financial position between each available survey (i.e. 1994 to 1996, 1996 to 1998, 1998 to 2000; and 1994 to 1996, 1994 to 1998, and 1994 to 2000) but no significant, discernible patterns emerged. This may be a by-product of the small sample size of those who rejoin the labor force at the time of each individual survey.
8. We repeat our analysis with the Rejoin the Labor Force sample being comprised only of those retirees whose status changed from “completely retired” to “partially retired” at some time across the 1996, 1998, and 2000 surveys. Our summary results are qualitatively the same. We thank an anonymous reviewer for making this point.
9. We also estimate an alternate probit model that includes inter-temporal changes in MARRY, HEALTH, INSURE, and SUPPORT. None of these coefficient estimates are statistically significant, and our remaining results are qualitatively the same.
10. We repeat our analysis with the Rejoin the Labor Force sample being comprised only of those retirees whose status changed from “completely retired” to “partially retired” at some time across the 1996, 1998, and 2000 surveys. Our results are qualitatively the same.
11. As with the full model, we estimate an alternate probit model that includes inter-temporal changes in MARRY, HEALTH, INSURE, and SUPPORT for each sub-sample. For the wanted sample, the  $\Delta$ HEALTH estimate ( $-0.5353$ ) and the  $\Delta$ INSURE estimate ( $0.8120$ ) are significant at the 10% level, suggesting that those who suffer a decline in health, or who lose employer-sponsored health insurance are more likely to return to work. All remaining results are qualitatively the same.

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