

Retirement Timing Decisions of American Men

Using various definitions of retirement, a multinomial logit model is estimated to examine retirement timing decisions, including retiring gradually or following periods in and out of the labor force compared to outright retirement. The results are sensitive to the definition of retirement used.

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This study examines how sensitive estimates of retirement timing are to various criteria used to define retirement. As Rones (1986, in Kosterlitz) has remarked, "No one can define who is retired and who isn't." Although many studies have looked at the retirement decision, most are not comparable because they do not use a standard definition of retirement. Two components to a definition are: the timing of retirement, and identifying the criteria used to define that timing.

Retirement has typically been treated in the literature as an "event" in a person's life when they stop working and face a future of rest and relaxation. An alternative conceptualization is of retirement as a "process" encompassing different patterns, motivated by a variety of individual reasons. Retirement may occur over a period of time characterized by a gradual reduction in work hours, or people may choose to change to less physically demanding employment prior to full retirement. Others who have been unemployed in the years preceding retirement may engage in a variety of part-time work opportunities.

Literature Review

Retirement Definitions

What criteria have been used to define when retirement takes place? No consistent definition has been used. Criteria defining full retirement have included:

1. Self-reported retirement (Anderson and Burkhauser 1989; Chirikos and Nestel 1989; Gustman and Steinmeier 1986; Parnes et al. 1985; Palmore et al. 1985);
2. Complete labor force withdrawal (no work hours reported) (Hanoch and Honig 1983; Hayward and Hardy 1985; Honig and Hanoch 1985; Quinn 1981);
3. Receipt of a pension or social security income (Boaz 1987; Palmore et al. 1985; Parnes et al. 1985; Sjogren 1986);
4. Working less than a given number of hours, usually between 1,000 and 1,800 during the year before retirement (Holden 1988; Palmore et al. 1985; Parnes 1985);
5. A combination of the above (Haug, Belgrave, and Jones 1992; Parnes et al. 1985; Palmore et al. 1985; Palmore et al. 1984).

Partial retirement has also been examined. Definitions include:

1. A decline in earnings (Gustman and Steinmeier 1984; Honig and Hanoch 1985; Honig and Reimers 1987); and
2. Searching for a new type of employment after quitting a main lifetime job (Hanoch and Honig 1983).

Differences in definitions make comparing results of retirement decision studies difficult. Add to this differences in data sets used and a quagmire is quickly entered that leaves one wondering whether we have a handle on the retirement question at all. Never-the-less, several factors have been found to be associated with the retirement decision.

The majority of literature has attributed the retirement decision to issues surrounding earnings and wealth, mandatory retirement policies, Social Security, private pensions, and health status (see Ransom et al. 1989). Higher wages have been found to be associated with later retirement (Mitchell and Fields 1984; Burtless and Moffitt 1984), while wealth and retirement were

found to be inversely related (Burtless and Moffitt 1984). Various researchers have identified changes in earnings, job displacement (unemployment), and policies relating to age discrimination and mandatory retirement as contributing to the retirement decision (Shapiro and Sandell 1987; Andriasani and Daymont 1987; Clark 1987; Johnson et al. 1987; Hanks 1990). Research has shown that increases in Social Security benefits decrease retirement age (Mitchell and Fields 1984; Burtless and Moffitt 1984). Increases in private pensions have been found to positively impact on early retirement (Palmore et al. 1985; Hardy 1985; see Quinn 1989).

Some researchers have examined the relationship between health and retirement. Anderson and Burkhauser (1985) found that using self-reported measures of health bias downward the effect of wages on retirement. Using the RHS Sickles and Taubman (1986) found positive effects of poor health on retirement. Sammartino (1987) found that poor health increases the probability of retirement and that older workers with health limitations do not respond to increases in Social Security payments by retiring later. Chirkos and Nestel (1989) found that men in "demanding" jobs are slightly more likely than others to retire early. Haveman et al. (1988) estimated the probability of continuing work, accepting early retirement, or accepting disability benefits. Large reductions in benefits led to only small reductions in the numbers of early retirees.

Retirement timing decisions (other than outright) have been examined by a number of researchers. However, most studies did not explicitly look at these decisions as part of the retirement timing process per se. Instead, they examined becoming reemployed after retirement has been defined as having taken place (Anderson and Burkhauser 1985; Honig and Reimers 1987; Butler, Anderson, and Burkhauser 1989; Berkovec and Stern 1991; Hardy 1991; Blau 1994). Others have examined "partial retirement" (Honig and Hanoch 1985; Quinn 1981). Wealth, race, number of dependents, occupational category, and health status have been associated with retirement timing.

Overall, three observations can be made about retirement timing literature to date. First, data limitations have hampered the study of the retirement process. Many studies have used cross-section data, or data that is not representative of the U.S. population of elderly. Of the studies that have used national, longitudinal data from sources such as the Retirement History Survey (RHS), Social Security Beneficiaries Study, or the National Longitudinal Survey of Labor Market Experience (NLS), the most recent study used longitudinal data that *ended* in 1985, and the majority of studies concentrated on only a few variables of interest. Second, using various,

inconsistent criteria to describe when retirement takes place has hampered the comparability of results. Third, most studies, because of restrictive definitions of retirement used, have not examined retirement as a process that can include various routes to labor force withdrawal.

Research Design and Methods

Several factors that affect well-being prior to retirement are hypothesized to affect the retirement timing decision. The model estimated here incorporates the idea that retirement may be either a single "event" or a "process" of gradual withdrawal from the labor force. A similar model has been used by Palmore et al. (1985) to describe retirement predictors.

Data

Because men and women have traditionally followed very different labor market patterns, only data from the Older Men cohort of the National Longitudinal Survey of Labor Market Experience (NLS) are used. This is a panel data set collected from 1966 through 1990 by the Bureau of Labor Statistics, U.S. Department of Labor. Data forming part of the older men cohort include an original sample of 5,020 men who were 45-59 years in 1966. The surveys monitor the pre- and post-retirement years.

Defining Retirement

The NLS provides a detailed description of the retirement transition, i.e., when the event occurred (or when the process began and ended). Timing of retirement information can be categorized into complete separation, decline in hours worked until full retirement, and periods of employment and unemployment. Establishing criteria to describe this point in time has been difficult for researchers.

Part-time work is a productive option for many older persons (Herzog et al. 1992; Kahne 1985). To leave it out of an examination of the retirement process is paramount to missing much of the input older persons may have in the economy. This study estimates the probability of falling into a particular category of retirement timing and compares the sensitivity of these estimates across 7 retirement criteria groups. These include:

1. Self reported retirement (When do you plan to retire?;
2. Self reported retirement 2 (activity survey week;

3. Worked fewer than 1,000 hours/year;
4. Worked fewer than 500 hours per year;
5. Receipt of Social Security or pension;
6. Receipt of Social Security or pension and worked fewer than 500 hours per year; and
7. Receipt of Social Security or pension and worked fewer than 1,000 hours per year;

Variables

Variables chosen for the analysis are those found by previous research to be important predictors of the retirement decision. They include several economic variables, including salary of the respondent (SALR), social security income (SOCSEC), transfer payments (including welfare and food stamps) (TRANSFER), non wage income (NWINC), age (AGE), years of education (EDUC), whether poor health limits working ability (HLIM), health limits of spouse, if present (HLIMSP), marital status (MARITAL), job satisfaction (JOBSAT), race (RACE), union participation (UNION), regional unemployment rate (UNEMPLOY), non-hazardous occupation (HAZARD), self employment status (SELFEM), working fewer than 26 weeks in the year before the retirement process began (OCCEXP), and plans to work after retiring (RETPLAN). It is important to note that variables representing salary of respondent (SALR) and job satisfaction (JOBSAT) are measured the survey year before the individual reports being retired or begins to retire if the process does not take place all at once. Thus, the analysis allows us to examine whether there are differences in precursor variables by timing of retirement. All monetary variables are reported using 1989 dollars. Five dummy variables for birth/retirement cohorts are included. Other studies using the NLS data have discounted the existence of cohort effects. Two birth cohorts were formed. The first includes those that were born between 1915 and 1921 and hence were not yet in the labor force when the depression began in 1929. The second includes those born between 1907 and 1914, who were just entering or were young members of the work force as the depression began. Members of cohort one were also more likely to have served in World War II, since they were between the ages of 21-27 in 1942. Three retirement periods were also defined based on the respondent year of retirement being 1966-71, 1975-80, or 1981-90. 1972 saw dramatic increases in the real benefits recipients received from social security, so distinguishing between periods one and two at that time is appropriate. The division at 1981 was made in part to

create periods which were somewhat comparable in size, and in part because there is a large gap in data collection for the NLS between 1983 and 1990. The choice of age cohort and period leads to an approximately standard cohort table (Glenn 1977). The variation measured between cohorts and between sampling times can be attributed to three possible effects: aging, cohort, and period. Descriptive statistics are provided in Table 1.

Empirical Specification

Given there are three categories ($y=0,1,2$) of retirement timing, a multinomial logit model is appropriate to estimate the above equation. Let P_0 , P_1 , and P_2 be the probabilities associated with these categories. The object is to express the probabilities in binary form. To estimate the model, consider that an individual falls into one of 3 categories ($y=0,1,2$) with the probabilities given above. These probabilities can be expressed in linear form as

$$\log \frac{P_1}{P_0} = \alpha_{10} + \alpha_{11}X \quad (1.a)$$

$$\log \frac{P_2}{P_0} = \alpha_{20} + \alpha_{21}X \quad (1.b)$$

$$\log \frac{P_2}{P_1} = (\alpha_{20} - \alpha_{10}) + (\alpha_{21} - \alpha_{11})X \quad (1.c)$$

Equations 1a through 1c are represented empirically by:

$$\begin{aligned} \text{RETIREMENT TIMING CATEGORY} = & \alpha_0 + \alpha_1 \\ & \text{MARITAL} + \alpha_2 \text{RACE} + \alpha_3 \text{EDUC} + \alpha_4 \text{UNION} + \\ & \alpha_5 \text{PENSION} + \alpha_6 \text{SALARY} + \alpha_7 \text{SOCSEC} + \\ & \alpha_8 \text{TRANSFER} + \alpha_9 \text{NWY} + \alpha_{10} \text{HLIM} + \alpha_{11} \text{HLIMSP} + \\ & \alpha_{12} \text{DEP} + \alpha_{13} \text{HAZARD} + \alpha_{14} \text{SELFEM} + \\ & \alpha_{15} \text{RETPLAN} + \alpha_{16} \text{JOBSAT} + \\ & \alpha_{17} \text{UNEMPLOY} + \alpha_{18} \text{OCCEXP} + \\ & \alpha_{19-23} \text{PERCOH1-5} + \text{ERROR} \end{aligned}$$

where the three retirement timing processes are outright retirement ($y=0$), gradual reduction in hours until retirement ($y=1$), and periods in and out of the labor force ($y=2$). This model is estimated using each of the seven different criteria used to define when retirement takes place and a maximum likelihood, multinomial logit procedure available in the statistical software package LIMDEP (Greene 1985).

Table 1. Mean and Standard Deviation of Variables

Variable	SELF RPT A	SELF RPT B	<500 HOURS	<1000 HOURS	PENSION/ SOCSEC	PEN/SS & <500	PEN/SS & <1000
RETIRE	0.87 (0.52)	0.60 (0.59)	0.54 (0.74)	0.51 (0.74)	1.04 (0.92)	0.41 (0.62)	0.37 (0.60)
MARITAL	0.85 (0.36)	0.81 (0.40)	0.84 (0.36)	0.85 (0.36)	0.86 (0.34)	0.86 (0.35)	0.86 (0.34)
RACE	0.26 (0.44)	0.37 (0.48)	0.31 (0.46)	0.31 (0.46)	0.30 (0.46)	0.30 (0.46)	0.29 (0.45)
AGE	62.27 (4.10)	60.81 (4.64)	61.26 (4.08)	61.06 (3.99)	60.65 (3.30)	62.99 (3.82)	62.93 (3.76)
EDUC	9.43 (3.76)	8.33 (3.97)	9.09 (4.00)	9.08 (3.98)	9.40 (3.92)	9.66 (3.92)	9.74 (3.86)
UNION	0.36 (0.48)	0.24 (0.43)	0.30 (0.46)	0.30 (0.46)	0.34 (0.47)	0.41 (0.49)	0.42 (0.49)
PENSION	0.44 (0.50)	0.26 (0.44)	0.30 (0.46)	0.30 (0.46)	0.51 (0.50)	0.44 (0.50)	0.45 (0.50)
SALARY	23440.00 (18960.0)	0.13E+05 (0.17E+05)	18270.00 (18350.00)	0.19E+05 (0.18E+05)	23840.00 (19580.00)	23420.00 (19380.00)	24060.00 (19270.0)
SOCSEC	2414.00 (4195.00)	1662.00 (3625.00)	2942.00 (4428.00)	2820.00 (4393.00)	2309.00 (4015.00)	4273.00 (4964.00)	4420.00 (5005.00)
TRANSFR	127.80 (825.40)	187.80 (1244.00)	124.60 (828.30)	123.80 (796.50)	104.30 (799.30)	63.72 (568.30)	73.85 (649.00)
NWY	11050.00 (15180.0)	0.12E+05 (0.22E+05)	12680.00 (19320.00)	0.13E+05 (0.18E+05)	11040.00 (17300.00)	12990.00 (15730.00)	13070.00 (15200.0)
HLIM	0.42 (0.49)	0.40 (0.49)	0.47 (0.50)	0.47 (0.50)	0.40 (0.49)	0.45 (0.50)	0.45 (0.50)
HLIMSP	0.25 (0.43)	0.27 (0.44)	0.29 (0.45)	0.29 (0.45)	0.25 (0.43)	0.27 (0.44)	0.27 (0.45)
DEP	0.25 (0.43)	0.25 (0.44)	0.27 (0.44)	0.27 (0.45)	0.30 (0.46)	0.24 (0.43)	0.24 (0.43)
HAZARD	0.70 (0.46)	0.75 (0.43)	0.72 (0.45)	0.72 (0.45)	0.69 (0.46)	0.67 (0.47)	0.67 (0.47)
SELFEM	0.10 (0.30)	0.21 (0.41)	0.17 (0.37)	0.17 (0.37)	0.12 (0.33)	0.05 (0.22)	0.06 (0.23)
REIPLAN	0.08 (0.26)	0.47E-01 (0.21)	0.06 (0.23)	0.60E-01 (0.24)	0.09 (0.29)	0.07 (0.25)	0.07 (0.25)
JOBSAT	0.78 (0.42)	0.53 (0.50)	0.67 (0.47)	0.67 (0.47)	0.76 (0.43)	0.65 (0.48)	0.65 (0.48)
UNEMPL	7.11 (2.91)	6.29 (2.80)	6.68 (2.99)	6.68 (3.03)	6.85 (2.80)	7.63 (3.06)	7.70 (3.10)
OCCEXP	0.09 (0.28)	0.17 (0.37)	0.17 (0.38)	0.16 (0.37)	0.06 (0.23)	0.22 (0.42)	0.22 (0.41)
COHORT1	0.00 (0.05)	0.86E-02 (0.93E-01)	0.01 (0.10)	0.11E-01 (0.11)	0.00 (0.04)	0.00 (0.06)	0.00 (0.06)
COHORT2	0.14 (0.35)	0.19 (0.39)	0.15 (0.35)	0.15 (0.36)	0.28 (0.45)	0.20 (0.40)	0.21 (0.41)
COHORT3	0.35 (0.48)	0.12 (0.32)	0.18 (0.39)	0.17 (0.38)	0.27 (0.45)	0.31 (0.46)	0.31 (0.46)
COHORT4	0.02 (0.13)	0.31 (0.46)	0.33 (0.47)	0.35 (0.48)	0.11 (0.31)	0.07 (0.26)	0.08 (0.27)
COHORT5	0.38 (0.49)	0.29 (0.45)	0.27 (0.45)	0.27 (0.45)	0.29 (0.45)	0.33 (0.47)	0.33 (0.47)
N	1315	464	1835	1795	2008	776	753

Results

Tables 2 and 3 present results of the multinomial logit procedure. Because using different retirement criteria affected the results greatly, only significant direction of effects are presented. This type of presentation allows one to easily compare sensitivity of results to the different criteria and to view at a glance the direction of effect of variables on the retirement timing

process. Note that in the empirical estimation the interpretation of the results for gradual retirees is as follows: compared to those that retired outright, how does each independent variable affect the probability that an individual will retire gradually? For those that follow periods in and out of the labor force before retirement the results are interpreted: compared to those that retired outright, how does each independent variable affect the probability that an individual will retire following periods

Table 2. Results at a glance: gradual retirement.

Variable	A	B	<500 HRS	<1000	PEN/SS	PEN/SS/<500	PEN/SS/<1000
INTERCEPT	+	+	+	+	+	+	+
MARITAL	+					-	
RACE							
AGE	-	-	-	-	-	-	-
EDUC	+	-					
UNION			-	-		-	-
PENSION	+					-	-
SALARY				+			
SOCSEC	-		-	-		-	-
TRANSFER	-		+	-			
NWY			-	-			
HLIM	-		-	-		-	
HLIMSP							
DEP							
HAZARD							
SELFEM		+		-		+	+
RETPLAN		+	+	+		+	+
JOBSAT	+		+	+		+	+
UNEMPLOY	-	-	-	-		-	-
OCCEXP		-	-	-		-	-
COHORT1							
COHORT2	-	-	+	-		-	-
COHORT3	-	-	-	-	-	-	-
COHORT4		-	-	-		-	-
COHORT5	-	-	-	-		-	-
N	1315	464	1835	1795	2008	776	753

Table 3. Results at a glance: in-and-out retirement.

Variable	A	B	<500	<1000	PEN/SS	PEN/SS/<500	PEN/SS/<1000
INTERCEPT	+		+	+		+	+
MARITAL						-	
RACE	+		+	+			
AGE	-	-	-	-		-	-
EDUC			+	+	-	+	+
UNION	-				-	-	+
PENSION					-		-
SALARY					-		
SOCSEC			+	-	-		
TRANSFER		-		-			-
NWY						-	-
HLIM		+	-	-			
HLIMSP					+	-	
DEP					+	+	+
HAZARD						+	
SELFEM		+	+	+		+	+
RETPLAN	-		+	+		+	+
JOBSAT			+	+		+	+
UNEMPLOY			-	-	-	-	-
OCCEXP			-	-	-	-	-
COHORT1							
COHORT2	-		-	-		-	-
COHORT3	-		-	-		-	-
COHORT4			-	-		-	-
COHORT5	-		-	-		-	-
N	1315	464	1835	1795	2008	776	753

in and out of the labor force before retirement?

The tables clearly show the results are sensitive to the criteria used to define retirement. In no case are the results the same when criteria are compared. However, results are most similar for criteria that define retirement timing based on both and hours and receipt of pension or

social criteria formula. For the gradual retirees AGE, UNION, SOCSEC, NWINC, HLIM, JOBSAT, RETPLAN and COHORT2-5 yielded consistent results for at least three of the seven retirement criteria. AGE, UNION, SOCSEC, NWINC, HLIM, COHORT2-5 all decreased the probability that an individual will retire

gradually compared to retiring outright. JOBSAT and RETPLAN both increased the probability of retiring gradually as compared to outright. MARITAL, EDUC, PENSION, TRANSFER), and SELFEMP changed both signs and significance levels depending on the retirement criteria used. SALARY was significant for only one criteria.

For the in/out retirees results were less consistent AGE, OCCEXP, and COHORT2-5 were the only variables that had consistent signs for at least four of the criteria. AGE, OCCEXP, and COHORT2-5 decreased the probability of having periods in and out of the labor force before complete retirement compared to retiring outright. RACE, NWINC, UNION, PENSION, DEP, and SELFEMP had consistent signs across two to four criteria, where significant. RACE and SELFEMP increased the probability of going in and out of the labor market compared with retiring outright, while UNION, PENSION, NWINC, and DEP decreased the probability. EDUC, SOCSEC, HLIM, JOBSAT, RETPL, and UNEMPLOY showed inconsistency in estimated directions of effects on in/out retirement processes.

Conclusions and Discussion

The objective of the study was to examine how retirement antecedents affect the probability of falling into a particular category of retirement timing processes. The only clear result based on applying the model outlined using different criteria to define retirement timing is that changes in retirement criteria lead to very different results. Economic variables, including increases in non-wage income, receipt of transfer payments and receipt of social security payments or a pension yielded very inconsistent results across the seven criteria for both gradual retirees and those that faced periods in and out of the work force as they retired. Belonging to a union, a structural component of last job held, consistently increased the probability of retiring outright. And, older persons who retired earlier in the data collection process are less likely to retire in ways other than an abrupt change in labor force activity. Family composition, health limitation, and post-retirement work preference variables did not perform consistently. Clearly, this study leads one to question the results of previous work in the area of retirement timing. Criteria used to define when retirement takes place have been inconsistently used in the past, making results of different studies of retirement incomparable. This study confirms others which have suggested that use of self reports of retirement cannot give a clear, consistent picture of the variables that influence retirement. And, the common use

in previous studies of using a self report from a question in the NLS which asks about expected future activity, yielded the least robust results in this study.

Using an hours-only restriction improved the results. However, the effects of transfer payments and self employment status were inconsistent as one moves from criteria that categorize persons as retired if they work less than 20 hours versus less than 10 hours per week. The most consistent and robust results were obtained using objective definitions that were the most restrictive: receipt of pension and/or social security payments combined with an hours restriction. When this definition was used, regardless of the number of hours chosen to define retirement, the inconsistencies in the two above mentioned variables vanished. The effect of transfer payments on the retirement timing process became insignificant and the effect of self employment became positive. Therefore, we suggest that future research be conducted using the most restrictive, objective criteria to define when retirement takes place.

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