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Married women's retirement behavior

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Abstract. In this paper we examine the economic and family determinants of married women's retirement behavior. A life cycle model of wives' retirement decisions is tested empirically using data on working married women from the Longitudinal Retirement History Survey. This exploratory analysis indicates that family considerations are more important in wives' retirement decisions than own economic opportunities. These findings contrast with those obtained previously for male workers and if substantiated by other research could have important implications for policy questions regarding pension and Social Security reform.

Though many analysts have studied the factors drawing women into the labor market, less attention has been focused on the process by which women withdraw from market work, particularly at older ages. This paper begins to fill the gap by examining the economic and family determinants of married women's retirement behavior.

Previous literature on wives' retirement patterns offers little analytical direction. We therefore turn to studies of retirement among male workers to develop a model, recognizing that men's retirement has been viewed in a relatively simple framework which focuses mainly on economic determinants of retirement outcomes.[1] In contrast, it is postulated here that married women's retirement be-

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[1] A review of the literature on male retirement patterns appears in Mitchell and Fields (1982). Several newer studies include Bazzoli (1985), Fields and Mitchell (1984a, b), Gustman and Steinmeier (1986), Hanoch and Honig (1983) and Honig and Hanoch (1985). Related models have also been used to examine unmarried women's retirement, and conclude that factors determining retirement among these women are similar to those affecting males. See Hanoch and Honig (1983) and Honig (1985), as well as Schwab and Irelan (1981).

havior is a more complex phenomenon, affected by both economic and family considerations. Section I describes the approach to women's retirement decisions within a family context. The empirical analysis uses the Longitudinal Retirement History Survey (LRHS), described in Sect. II. Estimated response parameters appear in Sect. III, and are compared to those derived previously for male workers. Findings are discussed in the context of retirement income policy.

I. Modelling wives' retirement patterns

Previous research on married women's retirement behavior consists mainly of cross-sectional empirical analyses, initiated by Bowen and Finegan's classic labor supply study (1969). Most relevant to the present study is their multivariate labor force participation model estimated using 1960 Census data on wives aged 55–64, and 65–74. Two significant findings emerge from that analysis: older wives appear to work less when their spouses are retired, and when family income is greater.

Subsequent research on older wives' labor force withdrawal establishes that wives' retirement is powerfully influenced by both *economic* variables (e.g. wages and pension eligibility), and *noneconomic* variables (e.g. having a husband in poor health, having dependent children) (Henretta and O'Rand 1980, 1983). The importance of both economic and noneconomic factors in wives' retirement decisions is further supported by the empirical research of Clark and Johnson (1980) and Clark et al. (1980). Here, cross-sectional labor force participation equations indicate that married females are more (less) likely to work when own wages (retirement benefits) are high, and when the husband is working.

Existing studies also suggest that retirement decisions by their nature depend on current as well as future income and leisure opportunities. That is to say, that women's retirement behavior should be cast into a life-cycle framework. For instance, Clark and Johnson (1980) and Clark et al. (1980) develop a complex, theoretical family-lifetime utility model using numerical analysis to deduce labor market patterns of hypothetical older workers. Unfortunately, this framework is so general as to be intractable for the purposes of statistical analysis.

To develop an empirically viable model of wives' retirement decisions, we start with a relatively simple theoretical construct. At a given point in time, termed the planning date, the married woman is assumed to select a retirement date (R) which maximizes her utility. Utility is a positive function of planned future lifetime consumption (C) and years to be spent in retirement (RET) such that $U = f[C(R), RET(R)]$. RET is equal to $D - R$, where D is the expected date of death, and R is the woman's retirement date. The wife's utility is maximized subject to her intertemporal budget constraint $[C = PVY(R) + HPVYR]$ which equals the present discounted value of the wife's income [PVY(R)] over the balance of her life, plus husband's income which proxies her nonlabor income [HPVYR]. PVY(R) is the discounted sum of earnings flows from the planning date to retirement, plus Social Security and private pension benefits from retirement to death.

The model itself is quite straightforward, so it will not be detailed here. However, a few words are in order regarding the characterization of the wife's retirement decision process implied by our theoretical approach. It is the life-cycle equivalent of what Killingsworth (1983) describes as the "male chauvinist model" in a one-period framework. Specifically, the wife is assumed to make her retirement decision subsequent to her husband, taking as given his retirement age choice. A fully simultaneous or "joint" family retirement model would be more general, but such an approach is empirically intractable at this juncture. This arises from the essential nonlinearity of the income opportunity constraints under U.S. Social Security benefit rules, since a wife's retirement benefits depend on when her husband retires and vice versa.

To elaborate this point, consider that under the U.S. Social Security system, one spouse is entitled to receive the larger of (*a*) benefits based on own work history, or (*b*) benefits amounting to one-half of the other spouse's entitlement. Furthermore, if one member of the couple, say the wife, retires prior to her husband, her benefits will be computed initially on the basis of her own work history only. Once her husband retires, she may obtain a payment increase if benefits based on her husband's work history are larger. These institutional realities imply that a fully specified budget set would incorporate alternative benefit possibilities at all possible retirement age combinations for the wife and her husband.

To develop a formulation which does justice to the complexity of the retirement problem and is still estimable, our model incorporates two simplifying assumptions. First, the "male chauvinist" construct helps reduce the dimensionality of the budget set, by allowing us to compute the wife's retirement income opportunities conditional on her husband's retirement date. We believe that this approach is justified for the generation of women retiring in the 1970s, which is the group examined empirically below. For these women, husbands' benefits were generally larger than half their own due to the intermittent workforce attachment of wives in these cohorts.

A second simplifying assumption reflects the need to project future income streams. It thus becomes necessary to designate a point in time called the planning date when the wife and husband make their retirement decision. In this case, the planning date is defined as the year the husband turns age 60, a choice stemming from computational and data considerations detailed below.

Due to nonlinearities inherent in older workers' income opportunity sets, it is virtually impossible to obtain clearcut comparative static predictions regarding the effect of exogenous variables on the wife's optimal retirement date.[2] However earlier research on males offers some direction (Fields and Mitchell 1984b), and it is hypothesized that similar predictions about the roles of economic variables can be made for working wives:

1. An increase in the worker's nonlabor income, or the pension income available for retirement at age 60 (holding constant subsequent accrual rates) induces earlier retirement, via a negative income effect on labor supplied.

2. An increase in earnings, or the pension/Social Security accrual rate, raises income as well as the price of leaving the labor force. Hence this type of change has both an income effect (inducing earlier retirement), and a substitution effect

[2] Burbidge and Robb (1980), MacDonald and Carliner (1982), and Fields and Mitchell (1984b) point out some of the ambiguities inherent in this type of model.

(inducing delayed retirement). For males, the substitution effect appears to dominate, so that increasing the rewards for deferring retirement produces later retirement ages.

In contrast to previous research which argues that retirement years for males are equivalent to leisure time, we believe that a significant portion of married women's non-market time may be devoted to home production activities. This recognition does not alter the formulation of the model, though it carries the implication that women's valuation of retirement years may be higher than men's in the empirical analysis.

In addition to these variables, it is also useful to examine the role of specific family factors in wives' retirement. For instance, the studies cited earlier suggest that married women respond to their husband's health and retirement status, the presence of dependent children, and the age difference between the two spouses. Unfortunately, theory provides few clearcut predictions about the expected signs on these variables. For example, a husband's poor health or the presence of dependents generates more financial need, so the wife may remain employed longer. On the other hand, such family factors may be conducive to earlier retirement if they raise the value of the woman's nonmarket time. Only empirical analysis can clarify further the actual direction of these effects.

II. Data and variables

No nationally representative longitudinal data set on older married women exists in the U. S. The sample examined in this paper consists of employed white married women who, with their husbands, are present in each wave of the Longitudinal Retirement History Survey (LRHS). This was a panel study conducted by the U. S. Social Security Administration over the period 1969–1979. The LRHS is structured so that males aged 58 to 63 in 1969 are the primary respondents. The data used in the present study are obtained from interviews conducted with the wives of these primary respondents; a detailed appendix describing the construction of our dataset is available on request.

The sample investigated is comprised of married women who were private sector workers in 1969 with husbands who were also employed in that year. The husbands of these women are a subset of males studies previously by Fields and Mitchell (1984b). Given the dearth of information on older women's retirement it was desirable to align our female sample with the earlier male study, so that results between men and women in the same two-earner couples could be compared. [3]

[3] The dual earner couples analyzed in this study are similar in many ways to couples of the larger sample ($N = 1024$) examined by Fields and Mitchell (1984b) which includes both working and non-working wives. Specifically, there are no significant differences (at the 5% level) between the husbands' retirement ages, levels of education, industry and occupational groupings, and retiree benefit amounts. Wives in the dual earner subsample are only slightly older (0.8 years), slightly better educated (0.6 years), and their husbands' earnings are somewhat lower (11%–14%). These results suggest that the subsample of dual earners used in this paper is representative of the larger group with respect to observable characteristics.

Table 1. Dependent variable: definitions and descriptive statistics
A. Continuous retirement variable

Variable	Mean (Std. dev.)	Variable definition
RETAGE	62.0 [4.2]	Wife's retirement age, defined as the age when the wife first describes herself as not working or looking for work, given that she worked in 1969. If the wife is still employed in 1979, RETAGE is set equal to her expected age of retirement.

B. Discrete retirement variable

Variable	Frequency	Variable definition
CHOICE = 1 (Very early)	42%	RETAGE < 62
CHOICE = 2 (Early)	35%	62 ≤ RETAGE < 65
CHOICE = 3 (Normal)	14%	65 ≤ RETAGE < 67
CHOICE = 4 (Late)	10%	RETAGE ≥ 67

Source: Authors' calculations from the LRHS sample of wives described in text.

In relation to males, the LRHS requires married women to complete only a subset of questions their husbands are asked and imposes no age restrictions on women included in the sample. The subsample we use in our analysis is thus limited to wives 54 to 62 years old in 1969, whose husbands are 59 to 61 in that year. These age differences between spouses reflect the larger age distribution of wives in the LRHS itself, as compared to the men. Age limitations for husbands are the result of our desire to avoid mortality bias and to ensure their worklives are complete, so that age of retirement can be observed.[4] The upper and lower age restrictions for wives are motivated by data concerns. The lowerbound age restriction of 54 is the result of reluctance to project future income opportunities for extremely young sample members since the earnings of younger women may not reflect pre-retirement labor income. In addition, applying "current" rules to calculate young workers' Social Security and pension income which will be paid far into the future introduces a larger margin of error than is desirable. The upper age limitation is imposed to reduce selection bias, because some older women will already have retired by 1969.[5] The resulting sample size is 139 working women in 1969, followed for ten years.

[4] Sample selection bias for the men is not likely to be a problem insofar as the average retirement age for males in the US is about 63 (Fields and Mitchell 1984b).

[5] While mortality bias may be a concern for men (see Fields and Mitchell 1984b), it is not likely to be of crucial importance for their wives. For example, women aged 58 in 1969 are expected to live an average of 22 more years; for males of the same age, the figure is 17 (U.S. Department of HEW 1975).

Table 2. Wives' retirement patterns relative to husbands'

Retirement pattern	Proportion of sample	Wife's age< husband's age	Wife's age≥ husband's age
Wife retires prior to husband	54	42%	12%
Wife retires with husband	14	9%	5%
Wife retires after husband	32	24%	8%
Column total (%)	100	75	25

Source: Authors' calculations from the LRHS sample of wives described in the text.

A. Retirement patterns of married women

The dependent variable analyzed is RETAGE, or the age when each wife first describes herself as without a job and not looking for employment.[6] Table 1 summarizes key characteristics of women's retirement patterns using this definition.[7] The average retirement age for women in the sample is 62, which is somewhat younger than the male average of 64. About 42% of the group retires prior to age 62 (termed here "very early" retirement), 35% retire at or after age 62 but before age 65 ("early" retirement), 14% retire at or after age 65 but before age 67 ("normal" retirement), and 10% retire at or after age 67 ("late" retirement). Table 2 summarizes the correspondence between wives' retirement patterns and those of their husbands. Overall, two-thirds of the women in this cohort retire prior to or at the same time as their husbands. Interestingly, this pattern seems invariant to whether the wives are younger or older than their spouses.

B. Explanatory variables

Three types of explanatory factors are used to explain working wives' retirement patterns: measures of income opportunities, measures of RET or years away from the labor force, and family responsibility measures. These are discussed in turn, below. Specific definitions as well as descriptive statistics appear in Table 3.

1. Income opportunities. Discounted income streams available to each wife are computed for four possible retirement ages (RETAGE = 60, 62, 65 and 67). These income streams are defined as [PVY(RETAGE)+HPVYR] corresponding directly to the theoretical budget constraint specified above. They consist of present

6 Other retirement definitions were also explored including the age at which workers left their 1969 jobs and the age at which they accepted Social Security benefits. These exploratory analyses proved quite similar to those reported below and are not described in detail here. Defining retirement as the age of Social Security acceptance is relatively uninteresting for married women, since a majority of the sample of wives appears to retire (using other definitions) prior to age 62, the age of first eligibility for Social Security (Iams 1986).

7 In a few cases a wife first interviewed in 1969 was still in the labor force in 1979 when the LRHS interviews ceased. Here RETAGE is set equal to the woman's expected age of retirement. An alternative methodology would be to formulate a duration model; this approach was not taken because of the empirical intractability of incorporating state-specific explanatory variables which vary over time in such a framework.

Table 3. Explanatory variables: definitions and descriptive statistics

Variable	Mean	Standard deviation	Variable definition
A. Income (thousands of 1970 dollars)			
PVY60	29.07	10.45	Present value of the wife's real expected income when her retirement age equals 60, 62, 65 or 67, assuming the husband's retirement age is known. Income is discounted to 1970.
PVY62	38.36	12.58	
PVY65	53.04	16.14	
PVY67	55.99	18.55	
YCHANGE	23.97	11.88	Present discounted value of the wife's expected real income at age 65 (PVY65) minus present discounted value of the wife's expected real income at age 60 (PVY60).
HPVYR	60.22	19.83	Present discounted value of the husband's real expected income assuming his actual retirement age is his planned retirement age. Income is discounted to 1970. Retirement age for males is defined as the age when the worker leaves his 1969 job.
B. RET			
RET60	20.07	0.55	Years the wife spends in retirement when retirement age equals 60, 62, 65 or 67. RET is the difference between the wife's life expectancy (in 1969) and retirement age. RET varies by cohort.
RET62	18.07	0.55	
RET65	15.07	0.55	
RET67	13.07	0.55	
C. Family			
AGEDIFF	2.89	2.30	Husband's age minus wife's age.
DEPCH	0.22	0.42	= 1 if the household supports childen in 1969. = 0 else.
HHPOOR	0.05	0.23	= 1 if a health index rates the husband as having poor health in any survey year prior to his retirement. = 0 else.
HRET60	0.44	0.50	= 1 if the husband is retired when the wife's retirement age equals 60, 62, 65 or 67. = 0 else.
HRET62	0.65	0.48	
HRET65	0.90	0.30	
HRET67	0.98	0.15	

Note: Sample size is 139 for all variables except HHPOOR, where $N = 129$, and DEPCH, where $N = 124$.

values of the wife's income opportunities that she could receive if she were to select one of the four alternative retirement dates, plus her husband's income given his retirement date.[8]

In computing the income amounts relevant to these four retirement dates we assume that the wife looks forward from the planning date, defined to be when her husband is age 60. This planning date is computationally convenient since it permits us to use one budget constraint and has little impact on estimated out-

[8] Fields and Mitchell (1984b) describe the construction of HPVYR in some detail for LRHS males in this sample.

comes in cases where husbands and wives are close in age. The assumption is subjected to sensitivity analysis in the empirical formulation by controlling for age differences across spouses. In a real-life setting, stochastic events such as retirement income changes or ill health make the retirement decision process a dynamic one. However, incorporating such factors in an empirical model is not feasible since the detailed information required for a stochastic programming specification is unavailable.

The life-cycle formulation used here already requires many separate calculations for discounted values of earning streams, Social Security benefit flows, and pension income streams. Gross earnings are projected for each individual using previous actual earnings.[9] After converting these to 1970 dollars, income and payroll taxes are subtracted based on the rules in effect at the planning date. Social Security benefit computations for the wife are based either on her own record, or half of her husband's, whichever is larger. These calculations incorporate information about the husband's retirement status at each point in time, and use the rules in place at the planning date. If a wife is eligible to receive a pension, the PVY equation also includes her (real) pension benefit stream.

Expected pension benefits for eligible women are derived from modifications of industry-level data on male retirees' benefits presented in Kotlikoff and Smith (1983). This is necessary because the LRHS provides very incomplete data on women's pensions, and no other nationally representative dataset contains better information. Kotlikoff and Smith's figures are given for age-65 retirees and are adjusted for earlier and later retirement. Finally, women's benefit levels are adjusted downward by a factor of 22%, based on evidence reported by Lazear and Rosen (1987) who study sex differentials in pension benefit amounts. Note that the analysis assumes that Social Security benefits are expected to be constant in real terms, but that pensions will fall at the inflation rate. While computed pension amounts are measured with some error, sensitivity analysis on LRHS men lends support to our approach. Using the same methodology described here, Fields and Mitchell (1984b) find that results are similar to those obtained from a smaller data set containing actual pension plan rules.

Table 4 summarizes alternative values of PVY, or the discounted values of income streams from the viewpoint of the planning date, expressed in 1970 dollars. Each year's income amounts are discounted by a 2% real interest rate, and the probability of mortality which varies by cohort.[10] The table shows that discounted income streams rise with the woman's retirement age until age 65. After that age, Social Security and pensions decline in present values. The budget set is also highly nonlinear, insofar as the returns to another year of work vary depending on when the woman retires. This finding is similar to that discerned for male LRHS workers by Fields and Mitchell (1984b).

The final component of the older woman's budget set is described as HPVYR, or the present value of the husband's expected income stream as of the planning date, taking his actual retirement date as his optimal retirement point. Male mor-

[9] This method is used in Bazzoli (1985) and Fields and Mitchell (1984b).

[10] The sample of wives encompasses nine birth-year groups, since it includes women age 54–62 in 1969. Age-specific mortality rates are incorporated accordingly.

Table 4. Married women's retirement budget sets: average present discounted values at selected retirement dates (1970 $)

Average present discounted values	If wife retires at age:			
	60	62	65	67
1. Earnings (PVE)	$ 0	$ 6404	$ 15184	$ 20702
2. Social Security (PVS) #	$ 23783	$ 24920	$ 29171	$ 27716
3. Private Pensions (PVP)	$ 5289	$ 7032	$ 8689	$ 7577
Wife's total income PVY = 1 + 2 + 3	$ 29072	$ 38356	$ 53044	$ 55995
Change in PVY (if retirement is deferred)		$ 9284	$ 14688	$ 2951

Note: All elements of the budget set are discounted to 1970. At this point, the spouses of the wives in the sample are approximately 60 years of age.
Social Security computations posit that wives retire at the stated age and apply for benefits when first eligible. Wives are also assumed to know their husbands' retirement age.

tality probabilities are taken into account along with a 2% real discount rate. For the average couple, husband's discounted income is around $ 60200 in contrast to the wife's PVY of $ 38000 (in 1970 dollars). The fact that the husband's income is relatively larger than the wife's lends credence to the "wife as follower" model outlined above.

2. Years out of the labor force. The model above posits that women value years out of the labor force, in addition to income. In practice, the retirement period, or RET, is measured as the difference between a wife's life expectancy and her retirement age. Hence it varies by age in 1969, as well as across retirement dates for each woman.

3. Family responsibilities. Several formulations of family responsibility variables are feasible with LRHS data. We consider the following: DEPCH, indicating the presence of dependent children in 1969; HRET, indicating whether the husband is retired; and HHPOOR, indicating whether the husband is in poor health in any survey year prior to his retirement. The health variable is described by Bazzoli (1985). Also of interest is a variable measuring the difference between the husband's and the wife's age (AGEDIFF), on the hypothesis that younger women married to older men may exhibit a different labor force attachment than do women closer in age to their spouses. Other family variables were also investigated, including the presence of dependent siblings or parents, but missing data and small resultant sample sizes limit the strength of these findings.

III. Empirical formulations and findings

Two reduced-form empirical formulations of the wife's retirement decision process are tested below, along the lines suggested by Fields and Mitchell (1984b): a regression framework, and a discrete choice logistic model. Each is discussed in turn.

A. The regression framework

One empirical formulation of the reduced-form retirement model postulates a linear relationship between the retirement age and two income variables: base income and the rewards for postponing retirement. Base income is defined as the expected present value of income the wife would receive if she retired very early, taken here to be age 60 (PVY60). Assuming that retirement years are a normal good, the ordinary income effect of higher base income should induce earlier retirement. In addition, diminishing marginal utility of income may also imply that wealthier couples will retire earlier.

The rewards for deferring retirement are summarized in a variable called YCHANGE, or the increase in the wife's discounted income stream if she defers retirement to age 65, versus retiring at 60. Higher values of YCHANGE imply a negative income effect, but a positive substitution effect, as noted above. Which effect dominates for married women has not yet been empirically established.

Empirical estimates of the effects of these economic variables appear in Table 5, as well as estimates of the factors reflecting family considerations. Column 1 shows the simplest model, consistent with that estimated for males by Fields and Mitchell (1984b). The sign of the own income variable is negative, in accord with expectations and earlier research. However, the coefficient is not statistically significant at conventional levels. The estimated YCHANGE coefficient suggests that the substitution effect dominates the income effect among females, as has been found for males, but the net result is not statistically significant.

As the results in columns 2–4 indicate, higher values of HPVYR are associated with later rather than earlier retirement among wives which is contrary to the model's predictions.[11] The effect is not consistently significant, but does suggest marital selection bias; that is, a woman married to a "workaholic" may share her husband's tendency to delay retirement.

The influence of variables indicating family responsibilities appears to be quite substantial, in the sense that the new variables are often significant and considerably increase explained variance. The significant effect of AGEDIFF in column 3, indicates that women retire earlier when their husbands are much older than they are. This seems to suggest that husbands' health problems are more severe in these relationships, but the effect persists when a proxy for health is introduced (HHPOOR). Indeed, a spouse's poor health is associated with delayed rather than earlier retirement among working women in the sample, perhaps because of greater need for employer-provided health insurance coverage. The

[11] This finding also contradicts cross-sectional findings for similar variables; for instance, see Bowen and Finegan (1969).

Table 5. Retirement age regressions for married women (Dependent variable = RETAGE)

Explanatory variables	[1]	[2]	[3]	[4]
Constant	62.66**	61.38**	63.40**	62.81**
	[1.24]	[1.51]	[1.69]	[1.74]
A. Income				
(thousands of 1970 $)				
PVY60	−0.05	−0.05	−0.06	−0.05
	[0.03]	[0.03]	[0.04]	[0.04]
YCHANGE	0.03	0.03	0.01	0.01
	[0.03]	[0.03]	[0.03]	[0.03]
HPVYR		0.03	0.04**	0.04*
		[0.02]	[0.02]	[0.02]
B. Family responsibilities				
AGEDIFF			−0.74**	−0.68**
			[0.15]	[0.16]
DEPCH			0.97	0.80
			[0.82]	[0.84]
HHPOOR				5.21**
				[1.56]
R-Squared	0.02	0.04	0.22	0.26
Sample Size ‖	139	139	124	114

Notes: RETAGE = continuous retirement variable; PVY60 = present value of wife's income if she retires at 60; YCHANGE = difference in present value of wife's income if she retires at 65 versus 60; HPVYR = present value of husband's retirement income; AGEDIFF = husband's age minus wife's age; DEPCH = dummy variable indicating dependent children; HHPOOR = dummy variable indicating husband has poor health. Precise variable definitions appear in Tables 1 and 3. Standard deviations are shown in brackets.

*$t \geq 1.65$; **$t \geq 1.96$

‖ Sample sizes vary due to missing observations for some explanatory variables (i.e. DEPCH and HHPOOR).

strong negative effect of AGEDIFF can possibly be attributed to working women's desire to share the retirement period with their spouses, indicating a degree of complementarity in leisure time of two-earner couples. Alternately, AGEDIFF may be acting as a proxy for underlying differences in tastes for work across wives. Irrespective of the interpretation used, adding AGEDIFF to the equation does not change the retirement age response of married women to income opportunities. Finally, the retirement outcomes of wives in households with dependent children are not discernibly different from those without such dependents.

In overview, the evidence from the regression model suggests that a working wife's retirement decision is only weakly affected by her life cycle income opportunities. Neither income nor substitution effects prove statistically different from zero. Factors playing a more powerful role are variables indicating her husband's income and health, as well as the difference between the spouses' ages. One variable which apparently plays no significant role is the presence of dependent children.

B. Logit models

Married women's retirement behavior may also be set in a discrete choice framework, which characterizes the retirement decision as a utility maximizing selection among several alternatives. This model is more general than the regression approach, since income and leisure information relevant to each retirement date can be explicitly incorporated. This structure also allows nonlinearities in the budget set to be represented more directly.

The basic formulation supposes that individual i selects retirement date j based on its attributes, defined in the present setting to be the income (PVY) and years spent in retirement (RET): $U_{ij} = [(PVY_{ij})^{\beta} * (RET_{ij})^{\phi}] * e_{ij}$, with β and ϕ are assumed constant for all i and j. Taking logs and making appropriate assumptions about the error term (e_{ij}) yields the following expression for the probability that an individual will select retirement age j: $P_j = \exp(V_j)/[\Sigma_K \exp(V_k)]$, where $V_j = [\beta * \ln(PVY_{ij}) + \phi * \ln(RET_{ij})]$, and $k(=1,\ldots,K)$ indicates the range of possible choices.[12]

Table 6 reports four sets of estimated Logit coefficients. The simplest formulation appears in Column 1 in which only the wife's income and her retirement leisure are assumed to determine her choice of retirement date. The results indicate that the effect of women's own income opportunities (LNPVY) on their retirement ages is small and not statistically different from zero. In contrast, the effect of retirement leisure (LNRET) is positive and significant. One way to assess the findings is to compute the relative weight of own income versus leisure in the retirement decision. The ratio of the coefficient values of these two variables (β/ϕ) for married women in the sample is 0.2, a smaller figure than the 0.6 obtained for the husbands of these couples found in previous work (Fields and Mitchell 1984b). This pattern is compatible with the view that women's valuation of retirement years may be higher than men's because of home production activities.

Column 2 extends the basic Logit formulation by incorporating husband's income (LNHPVYR). Since the value of LNHPVYR does not vary across retirement states for a given person, this "mixed" Logit model produces a set of choice-specific coefficient estimates for that variable. For instance, the negative P1/P4 coefficient indicates that higher husband's income reduces the probability of wives retiring "very early" (choosing outcome P1) versus "late" (choosing outcome P4). Though the individual coefficients on husband's income are statistically significant, the magnitudes are not particularly large: the overall effect of a 25% increase in husband's income would result in the wife delaying her retirement age by a little over four months.[13] Comparing columns 1 and 2, we find that including husband's income does not alter the signs of the wife's own income and

12 McFadden (1981) has pointed out that the conditional Logit model has the virtue of being derived from utility theory. However his model has been criticized because it assumes behavior is unaffected by the presence or absence of alternatives not chosen by the individual. We have tested whether this is a suitable assumption in the context of married women's retirement decisions and find it to be appropriate. Additional details are available on request.

13 The baseline predicted retirement age is obtained by evaluating the model using reported coefficients from Table 6 and mean values of all explanatory variables.

Table 6. Estimated utility function parameters for married women: logit coefficients (Dependent variable = CHOICE)

Explanatory variables		[1]	[2]	[3]	[4]
A. Income					
(thousands of 1970 $)					
LNPVY		0.86	0.83	0.72	0.82
		[0.56]	[0.62]	[0.75]	[0.79]
LNHPVYR	P1/P4		−2.12**	−2.10**	−1.90*
			[0.82]	[1.02]	[1.08]
	P2/P4		−1.57**	−1.34*	−1.19
			[0.61]	[0.76]	[0.81]
	P3/P4		−0.76**	−0.68*	−0.53
			[0.27]	[0.35]	[0.37]
B. RET					
LNRET		5.17**	24.96**	21.07**	20.30*
		[1.20]	[7.94]	[9.96]	[10.53]
C. Family responsibilities					
AGEDIFF	P1/P4			0.47**	0.40**
				[0.17]	[0.18]
	P2/P4			0.11	0.06
				[0.15]	[0.16]
	P3/P4			−0.02	−0.07
				[0.16]	[0.18]
DEPCH	P1/P4			−0.91	−0.90
				[0.85]	[0.86]
	P2/P4			−0.15	−0.36
				[0.78]	[0.81]
	P3/P4			0.77	0.33
				[0.82]	[0.86]
HHPOOR	P1/P4				−2.91**
					[1.30]
	P2/P4				−1.99**
					[1.01]
	P3/P4				§
HRET				−0.28	−0.33
				[0.41]	[0.42]
Log likelihood ratio		−170	−166	−138	−126
Sample size		139	139	124 ‖	114 †

Notes: CHOICE = discrete retirement variable (1 = very early; 2 = early; 3 = normal; 4 = late); LNPVY = log of the present value of wife's income; LNHPVYR = log of the present value of husband's retirement income; LNRET = log of the number of years the wife spends in retirement (leisure); AGEDIFF = husband's age minus wife's age; DEPCH = dummy variable indicating dependent children; HHPOOR = dummy variable indicating husband has poor health; HRET = dummy variable indicating husband is retired. Precise variable definitions appear in Tables 1 and 3. Standard deviations are shown in brackets. Pi (i = 1, 2, 3) indicates the probability the ith choice will be made, so P1/P4 is the ratio of the probability of choosing very early retirement (CHOICE = 1) versus late retirement (CHOICE = 4).

* $t \geq 1.65$; ** $t \geq 1.96$

§ Convergence not achieved due to lack of variation for this CHOICE category.

‖ Sample size is reduced to 124 because of missing data. The frequency of CHOICE 1 is 39%; of CHOICE 2 is 36%; of CHOICE 3 is 15%; of CHOICE 4 is 10%.

† Sample size is reduced to 114 because of missing data. The frequency of CHOICE 1 is 39%; of CHOICE 2 is 36%; of CHOICE 3 is 15%; of CHOICE 4 is 11%.

leisure variables, nor does it alter the predicted retirement age derived from the model (the predicted retirement age from both models is 62.03).

Columns 3 and 4 incorporate several family responsibility variables. The differences in age between spouses (AGEDIFF) is strongly linked with very early retirement (prior to age 62), though not with the other retirement combinations. On the basis of model 4, a wife who is the same age as her husband would retire a little more than twenty months (or 1.69 years) later as compared to a woman five years younger than her mate. The predictions for husbands in poor health (HHPOOR) are similar to those discerned in the regression context: wives delay retirement when their husbands are unwell. This effect is strongest for the very early (choosing outcome P1) and early (choosing outcome P2) retirement choices. For example, the wife with a healthy spouse retires some thirty-two months (or 2.68 years) earlier than her counterpart with an ill husband. Finally, wives' retirement choices are not significantly affected by whether the husband is retired or the presence of dependent children (HRET and DEPCH). This finding contrasts with the results discussed by Henretta and O'Rand (1980, 1983) and Clark et al. (1980), probably because those studies do not control on income and leisure opportunities, unlike here.

IV. Discussion and conclusion

This study has two objectives: to examine how economic factors affect wives' retirement patterns, and to establish the relative importance of family considerations in married women's retirement decisions. We formulate a life cycle model and test it, using two empirical frameworks.

Our findings are best viewed as preliminary because of the small size of the dataset employed. Nevertheless there exists no better longitudinal survey on older working women. The results indicate that wives' own economic opportunities tend to be insignificant determinants of their retirement patterns. This conclusion differs sharply with evidence for male workers where economic opportunities appear to play a more powerful role. In contrast, other variables are more important for women. Specifically, married women appear to value nonwork years highly, particularly if their spouse is much older than they. Having a husband in poor health appears to increase rather than impede a working woman's continued labor force attachment, but the presence of dependent children has no discernable impact. Higher husband's income tends to be associated with delayed retirement among wives, possible evidence for marital selection in tastes toward work.

If these findings are substantiated in other studies, they could have important implications for those concerned with retirement income reform. Previous studies indicate that men do not defer retirement by very much when faced with cuts in Social Security or pension benefits (Fields and Mitchell 1984a; Gustman and Steinmeier 1986; Zabalza and Piachaud 1981). The present analysis suggests that women will probably defer retirement by less, if at all. Hence it is expected that benefit reductions intended to induce delayed retirement will not substantially alter working couples' retirement patterns. As a result, retirement income for older families will probably fall.

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