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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 model of wives' retirement behavior is developed and tested empirically using data on working married women. Estimated response parameters are compared to those obtained previously for male workers. Our findings are directly relevant to policy questions regarding pension and Social Security reform.

Married Women's Retirement Behavior

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

I. MODELING 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 appears in studies by Henretta and O'Rand (1980, 1983), who examine several different waves of the LRHS to establish the prevalence of retirement patterns among women.[2] Most important for the present purposes are the authors' findings 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). The importance of both economic and noneconomic factors in wives' retirement behavior 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 women are more (less) likely to work when own wages (retirement benefits) are high, and when the husband is working.

Prior studies thus suggest that both family and economic variables affect older wives' labor market attachment. However, research to date does not cast women's behavior into a life-cycle framework.[3] This is a serious drawback, insofar as retirement decisions are by their nature dependent on both current and future income and leisure opportunities. The intertemporal structure of retirement income opportunities and the retirement decision is not explicitly recognized in studies taking a cross-sectional perspective.

To develop a model of wives' retirement behavior in a life-cycle context, it is assumed that, at the planning date (time 0), the wife selects an optimal retirement date R*. R* is interpreted as the point at which the woman withdraws from the labor force. The planning date is defined to be the year in which her husband turns age 60.[4] It is further postulated that she seeks to maximize her remaining lifetime utility,[5] a function of two arguments: remaining years to be spent in retirement (RET), and the present discounted value of income streams (PVY).

$$U = f\ [PVY(R),\ RET(R)]$$

RET is equal to D - R, where D is the expected date of death, and R is the woman's retirement date. In previous research on men's retirement, it has been assumed that RET is equivalent to years spent in leisure. However, for married women, it is quite likely that a significant portion of the non-labor market period may be devoted to home production activities. While this recognition need not alter the formulation of the utility function, it carries the implication that women's valuation of RET years may be higher than men's.

PVY(R) is the discounted sum of three income components: earnings flows [PVE(R)], pension benefit streams [PVP(R)], and Social Security streams [PVS(R)]. All three streams can (and usually do) depend on when the woman retires, since earnings at older ages need not be constant, and pension as well as Social Security benefit rules are not generally actuarially neutral. The present value of earnings at a specific retirement date, R, is expressed as follows:

$$PVE(R) = \int_0^R E_t\, g_t\, dt,$$

where E_t is the wife's earnings net of income taxes and required pension/Social Security contributions, accruing from the planning date (time 0) to the retirement date. A discount factor, gt, captures time preferences and mortality. The expression PVP(R), in turn, is specified as

$$PVP(R) = \int_R^D P_t(R)\, g_t\, dt.$$

This represents the discounted sum of the wife's employer-provided pension benefits, given that she retires at age R and she is eligible for a pension. A similar expression indicates the discounted value of Social Security benefits:

$$PVS(R) = \int_R^D S_t(R)\, g_t\, dt.$$

In addition to the woman's own earnings and retirement benefits, the discounted total value of her husband's income is also allowed to affect her retirement decision. In this paper, the wife is assumed to make her retirement decision subsequent to her husband, taking as given his retirement age choice. This formulation is not a fully simultaneous one; rather, it is the life-cycle equivalent to what Killingsworth (1983) describes as a "male chauvinist" model in the static one-period framework. The justification for such an assumption stems from the empirically intractable nature of a fully simultaneous model at this juncture. This arises from the essential nonlinearity of the income opportunity constraints under Social Security benefit rules, since a wife's retirement benefits depend on when her husband retires.[6] In addition, casting the wife's retirement decision as conditional on the husband's seems plausible for the generation of women retiring in the 1970s, which is the group examined empirically below.

In general, the wife's consumption (C) from time 0 onward, must not exceed the present value of her total income (PVY(R)), plus the value of nonlabor income including her husband's contribution (W):

$$C = PVY(R) + W.$$

Subject to this income constraint and the total time constraint (RET = D - R), the wife is assumed to select her optimal retirement date R* such that she maximizes her utility. This is accomplished by equating the marginal utility of an extra retirement year with the marginal utility of consumption from working one more year.[7] An interior solution is obtained if equality between the two conditions is achieved between the planning date (time 0) and the worker's date of death (D); otherwise the worker never retires (if the marginal utility of consumption always exceeds the marginal utility of an extra year of leisure), or retires immediately (when the reverse is true).

Previous research has shown that it is virtually impossible to obtain clear-cut comparative static predictions regarding the effect of exogenous variables on R*, the optimal retirement date, in the general case. This ambiguity arises from the nonlinearities inherent in older workers' income opportunity sets.[8] Earlier research by Fields and Mitchell (1984b), however, offers some direction. The following appear to hold true empirically for working men around the retirement date, and it is expected 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 (inducing delayed retirement). For men, the substitution effect appears to dominate, so that increasing the rewards for deferring retirement produces later retirement ages.

In addition to these economic variables, it is also useful to examine the role of family factors in wives' retirement behavior. For instance, the studies cited earlier suggest that married women respond to the health and retirement status of their husbands, the presence of dependent children, and the age difference between the two spouses. Unfortunately, theory provides few clear-cut predictions about the expected signs on these variables. A husband's poor health or the presence of dependents, for example, 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

The sample of older women examined in this paper consists of the wives of white married men surveyed by the Social Security Administration over the ten-year period between 1969 and 1979. Husbands in these couples are examined by Fields and Mitchell (1984b). The wives' sample includes women working in 1969, whose husbands also worked in that year. In addition, the women and their husbands are present in all waves of the LRHS between 1969 and 1979. Only private sector wage and salary workers are included in the analysis, since no pension data are available for government or military employees. The sample is further restricted to wives aged 54 to 62 in 1969 (husbands of these women were age 59-61 in that year).[9] The resulting sample size is 139 working women in 1969, followed for ten years.[10]

A. Retirement Patterns of Married Women

The dependent variable analyzed here is RETAGE, or the age when each wife first describes herself as without a job and not looking for employment. Table 1 summarizes key characteristics of women's retirement patterns using this definition.[11] The average retirement age 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.

Table 1

Dependent Variable: Definitions and Descriptive Statistics

A. Continuous Retirement Variable

Variable	Mean (Std. Dev.)	Variable Definition
RETAGE	62.0	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 the text.

Table 2

Wives' Retirement Patterns Relative to Husbands'

Retirement Pattern	Proportion of Sample	Wife's Age $<$ Husband's Age	Wife's Age $\geq$ 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.

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[12] and consist of present 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.[13]

Computing the income amounts relevant to these four retirement dates requires a number of separate calculations for discounted values of earning streams (net of taxes), Social Security streams, and pension streams.[14] The wife is assumed to be looking forward from the planning date, when her husband is age 60 (in about 1970, for the men in the sample). Gross earnings are projected for each individual, using previous actual earnings.[15] 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.[16] 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

Table 3

Explanatory Variables: Definitions and Descriptive Statistics

Variable	Mean	Standard Deviation	Variable Definition
A. Income (thousands of 1970 dollars):			
PVY60 PVY62 PVY65 PVY67	29.07 38.36 53.04 55.99	10.45 12.58 16.14 18.55	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.
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 men is defined as the age when the worker leaves his 1969 job.
B. RET:			
RET60 RET62 RET65 RET67	20.07 18.07 15.07 13.07	0.55 0.55 0.55 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.
C. Family:			
AGEDIFF	2.89	2.30	Husband's age minus wife's age.
DEPCH	0.22	0.42	= 1 if the household supports children in 1969. = 0 else.

(table continues)

Table 3 Continued

Variable	Mean	Standard Deviation	Variable Definition
C. Family: (cont.)			
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.

equation also includes her (real) pension benefit stream. Because the LRHS provides very incomplete data on women's pensions, expected benefits for eligible women are derived from modifications of industry-level data on male retirees' benefits presented in Kotlikoff and Smith (1983). These figures are given for retirees aged 65 and are adjusted for earlier and later retirement.[17] 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.

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.[18] 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 value. The budget set is also highly nonlinear, insofar as the returns to another year of work vary depending on when the woman retires.[19]

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.[20] This averages around $60,200 in 1970 dollars, in contrast to an average woman's PVY of $29,000 if she were to retire very early (i.e., at age 60) and $56,000 if she were to defer retirement to age 67, a "late" retirement date.

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	$ 6,404	$15,184	$20,702
2. Social Security (PVS)[a]	23,783	24,920	29,171	27,716
3. Private Pensions (PVP)	5,289	7,032	8,689	7,577
Wife's Total Income PVY = 1 + 2 + 3	29,072	38,356	53,044	55,995
Change in PVY (if retirement is deferred)	9,284	14,688	2,951	

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.

[a]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.

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.[21] Also of interest is a variable measuring the difference between the ages of the husband and the wife (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.

III. EMPIRICAL FORMULATIONS AND FINDINGS

Two empirical formulations are developed 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 model described earlier postulates a linear relationship between 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 men 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 married women, as has been found for men, 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.[22] 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

Table 5

Retirement Age Regressions for Married Women
(Dependent Variable = RETAGE)

Explanatory Variables	[1]	[2]	[3]	[4]
Constant	62.66 [50.43]	61.38 [40.61]	63.40 [37.47]	62.71 [36.04]
A. Income (thousands of 1970 dollars):				
PVY60	-0.05 [1.45]	-0.05 [1.62]	-0.06 [1.62]	-0.05 [1.36]
YCHANGE	0.03 [1.10]	0.03 [0.88]	0.01 [0.24]	0.01 [0.25]
HPVYR		0.03 [1.48]	0.04 [2.04]	0.04 [1.89]
B. Family Responsibilities:				
AGEDIFF			-0.74 [4.92]	-0.68 [4.38]
DEPCH			0.97 [1.19]	0.80 [0.95]
HHPOOR				5.21 [3.33]
R-Squared	0.02	0.04	0.22	0.26
Sample Size[a]	139	139	124	114

Notes: T-statistics are shown in brackets. Variable definitions appear in Tables 1 and 3.

[a]Sample sizes vary owing to missing observations for some explanatory variables (i.e., DEPCH and HHPOOR).

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 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 complimentarity 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 and 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 alternative j based on its attributes, defined in the present setting to be the income (PVY) and years spent in retirement (RET) associated with retirement date j:

$$U_{ij} = [(PVY_{ij})^{\beta} * (RET_{ij})^{\phi}] * e_{ij},$$

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,...,K) indicates the range of possible choices.[23]

Table 6 reports four sets of estimated logit coefficients. The simplest formulation appears in Column 1, in which only the wife's income and RET are assumed to enter her utility function. Here it is evident that the effect of own income opportunities on wives' retirement ages is

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 dollars):					
LNPVY		0.86	0.83	0.72	0.82
		[1.53]	[1.33]	[0.96]	[1.04]
LNHPVYR	P1/P4		-2.12	-2.10	-1.90
			[2.59]	[2.06]	[1.77]
	P2/P4		-1.57	-1.34	-1.19
			[2.58]	[1.77]	[1.47]
	P3/P4		-0.76	-0.68	-0.53
			[2.79]	[1.96]	[1.41]
B. RET:					
LNRET		5.17	24.96	21.07	20.30
		[4.32]	[3.14]	[2.11]	[1.93]
C. Family Responsibilities:					
AGEDIFF	P1/P4			0.47	0.40
				[2.72]	[2.29]
	P2/P4			0.11	0.06
				[0.73]	[0.36]
	P3/P4			-0.02	-0.74
				[0.11]	[0.41]
DEPCH	P1/P4			-0.91	-0.90
				[1.08]	[1.04]
	P2/P4			-0.15	-0.36
				[0.19]	[0.45]
	P3/P4			0.77	0.33
				[0.95]	[0.38]
HHPOOR	P1/P4				-2.91
					[2.23]
	P2/P4				-1.99
					[1.98]
	P3/P4				a
HRET				-0.28	-0.33
				[0.68]	[0.79]
Log Likelihood Ratio		-170	-166	-138	-126
Sample Size		139	139	124[b]	114[c]

(table continues)

Table 6 Continued

Notes:

CHOICE = discrete retirement variable (1 = very early; 2 = early; 3 = normal; 4 = late)

Other variable definitions appear in Tables 1 and 3. T-statistics 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).

[a]Convergence not achieved due to lack of variation for this CHOICE category.

[b]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%.

[c]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%.

smaller than for married men; indeed the effect of LNPVY is not significantly different from zero. The effect of LNRET is positive and significant. One way to assess the findings is to compute the relative weight associated with own income, versus leisure. The ratio of the coefficient values of these two variables (β/ϕ) for married women in this sample is 0.2, a smaller figure than the 0.6 obtained for LRHS men in previous work (Fields and Mitchell, 1984b). In general, then, married women's income opportunities do not seem to powerfully influence their retirement patterns, though the utility weight attached to nonwork years is large and statistically significant. This pattern is compatible with the view that women's valuation of RET years may be higher than men's because of home production activities.

Column 2 extends the conditional 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 choice-specific coefficient estimates. For instance, higher husband's income reduces the probability of wives retiring "very early" versus "late" (P1/P4). This conclusion reinforces the regression results for this variable discussed above. Additionally, the inclusion of LNHPVYR does not alter the effect of wife's own income and leisure variables. Though a direct measure of wealth is not available, the fact that results are robust in the presence of LNHPVYR suggests the absence of omitted variable bias.

Columns 3 and 4 incorporate several family responsibility variables that also perform well. Again, the same conclusions hold for the wife's income and leisure effects. AGEDIFF is strongly linked with very early retirement (prior to age 62), though not with the other retirement combinations. The results for HPOOR are similar to those discerned in the regression context: wives with husbands in poor health delay retirement. This effect is strongest for the very early (RETAGE $<$ 62) and early (62 $\leq$ RETAGE $<$ 65) retirement choices. Finally, neither HRET nor DEPCH is significantly associated with any of the retirement choices in this setup. This contrasts with the results discussed by Henretta and O'Rand (1980, 1983) and Clark et al. (1980), probably because those studies, unlike this one, do not control for income and leisure opportunities.[24]

IV. DISCUSSION AND CONCLUSION

This study has two objectives: (1) to examine how economic factors affect wives' retirement patterns, and (2) to establish the relative importance of family considerations in married women's retirement behavior. We formulate a life-cycle model and test it using two empirical frameworks.

In both formulations, the results indicate that wives' own economic opportunities tend to be insignificant determinants of their retirement patterns. This conclusion differs sharply with evidence for working men, where economic opportunities tend 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 spouses are 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 discernible impact. Higher husband's income tends to be associated with delayed retirement among wives, possible evidence for marital selection in tastes toward work. Though these results should be interpreted with caution because of the small size of the data set employed, the characteristics of dual-earner couples are similar to those of a larger, more representative sample used in previous analyses (Fields and Mitchell 1984b).

Our results have important implications for lawmakers, especially those concerned with retirement responsiveness to pension and Social Security income. Previous findings indicate that men do not defer retirement by very much, when faced with cuts in Social Security or pension benefits.[25] This study suggests that women will probably defer retirement 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.

Notes

[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 (1984 a,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 men. See Hanoch and Honig (1983) and Honig (1985), as well as Schwab and Irelan (1981).

[2]These authors merge and compare information from a number of different LRHS waves, so their dependent variables have life-cycle aspects. However they do not consider the complex income opportunities potentially available to women at different retirement ages, and women's responses to them, which are the focus of the present paper.

[3]An exception to this generalization appears in a theoretical effort by Clark and Johnson (1980), and Clark et al. (1980). They use numerical analysis to deduce labor market patterns of hypothetical older workers given a complex two-person, family lifetime utility model which also includes home production and human capital investments. This framework is so general as to be intractable for the purposes of statistical analysis, however. A survey of life-cycle retirement models appears in Mitchell and Fields (1982).

[4]In previous research, it was assumed that the husband's retirement planning date coincided with age 60 (Fields and Mitchell, 1984b). The empirical work in this paper uses a subset of the same sample of men and their wives, so this assumption is computationally convenient and

probably has little impact on estimated outcomes when husbands and wives are close in age. The assumption is subjected to sensitivity analysis by focusing on cases in which the age difference across spouses is substantial.

[5]It is assumed that the utility function is monotonic, twice differentiable, concave, and stable over time. The budget constraint is also postulated to be stable over time, though in the empirical analysis this assumption is relaxed, as is the assumption of a fixed date of death (D). The latter is replaced with declining survival probabilities derived from life tables current at the time the women (and their spouses) were making retirement decisions.

[6]Under the U.S. Social Security system, a wife is entitled to receive either one-half of her husband's benefits, or benefits based on her own work history, whichever is greater. A wife may also retire prior to her spouse on the basis of her own work eligibility, and then obtain a benefit increase when her husband retires (if benefits based on her work history are smaller). These institutional realities imply that conditional and very complex budget sets would have to be developed for each of the two workers, for every possible retirement age. Estimating such a model is not currently possible. In the interest of reducing the dimensionality of the problem, the "wife as follower" construct described above, thus seems particularly appropriate for the cohort of interest here.

[7]The Lagrangian for this constrained maximization problem yields first-order conditions $\partial U/\partial RET = \partial U/\partial C * \partial PVY/\partial R$, where $\partial PVY/\partial R =$

$$E_R*g_R - P_R*g_R + \partial[\int_{R+1}^{D}(P_t*g_t)\,dt]/\partial R.$$

[8]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.

[9]On the one hand, the lower-bound age restriction follows from reluctance to project needed income figures for all possible retirement dates, for very young sample members. On the other hand, the age restriction for older women reduces the possibility of sample selection bias, since some of the older women would have retired by the first survey date (in 1969).

[10]The dual-earner couples analyzed in this study are similar in many ways to couples of the larger sample (N = 1,024) examined by Fields and Mitchell (1984b), which includes both working and nonworking 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 (.8 years), slightly better educated (.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.

[11]In a few cases, a wife first interviewed in 1969 was still in the labor force in 1979, when the LRHS interviews ceased. In such cases, RETAGE is set equal to the woman's expected age of retirement. Other retirement age 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 appear to retire (using other definitions) prior to age 62, the age of first eligibility for Social Security (Iams, 1986).

[12]This sum is the empirical equivalent of PVY(R) + W in the general model discussed above. The extremely poor quality of the asset data in the LRHS precludes the inclusion of an extended measure of nonlabor income.

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

[14]A data appendix describing the construction of these variables is available from the authors on request.

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

[16]Similar benefit rules apply to husbands, but because husbands' benefits are generally larger than half their wives', owing to women's intermittent workforce attachment, this possibility is set aside in the empirical computations.

[17]Fields and Mitchell (1984b) find that results derived using this methodology resemble those produced from a different data set based on actual pension plan rules.

[18]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.

[19]This finding is similar to that discerned for male LRHS workers by Fields and Mitchell (1984b).

[20]Male mortality probabilities are taken into account, along with a 2% real discount rate.

[21]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. The health variable is described in greater detail by Bazzoli (1985).

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

[23]McFadden (1981) has pointed out that this conditional logit model has the virtue of being derived from utility theory. However, the model has been criticized by others, in that it assumes behavior is unaffected by the presence or absence of alternatives not chosen by the individual; this is, the IIA assumption, or independence of irrelevant alternatives. Below we examine whether IIA is a suitable assumption in the context of married women's retirement decisions.

[24]In order to test the underlying validity of the IIA assumption discussed earlier, we undertake three formal tests, each of which uses the PVY-RET formulation in column 1 of Table 6 (these tests cannot be readily applied to the mixed logit formulations of columns 2-4). The first test, described by Hausman and McFadden (1981), compares coefficient estimates derived from using the full data set, with those derived from using data subsets. Estimated T values range between 0.88 and 2.05, far smaller than the critical values of T required to reject the null hypothesis of IIA; with 2 degrees of freedom, the critical value is 10.6 at $p = 0.005$, and 5.9 at $p = 0.05$. The IIA hypothesis is also not rejected using Small's (1981) procedure. This approach essentially

adds another variable to the model, which permits "nearby" alternatives to affect utility of an alternative actually chosen. We cannot reject the null hypothesis, which is that the estimated coefficient on the additional variable equals zero; the estimated coefficient value on this new variable is -0.23, with a t-statistic of 0.39. The final test of the IIA assumption is a simple Chi-square test. This compares predicted probability in the simple logit model, with those from the ordered logit model, as described in Fields and Mitchell (1984b). Here too, one cannot reject the null hypothesis that IIA holds; the calculated value of the test statistic is .001, with 3 degrees of freedom, whereas the critical value is 12.8 at p = 0.005, and 7.8 at p = 0.05. In other words, the IIA assumption in the simple logit framework appears to be appropriate for examining women's retirement patterns.

[25]Fields and Mitchell (1984a), Gustman and Steinmeier (1986), Zabalza and Piachaud (1981).

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