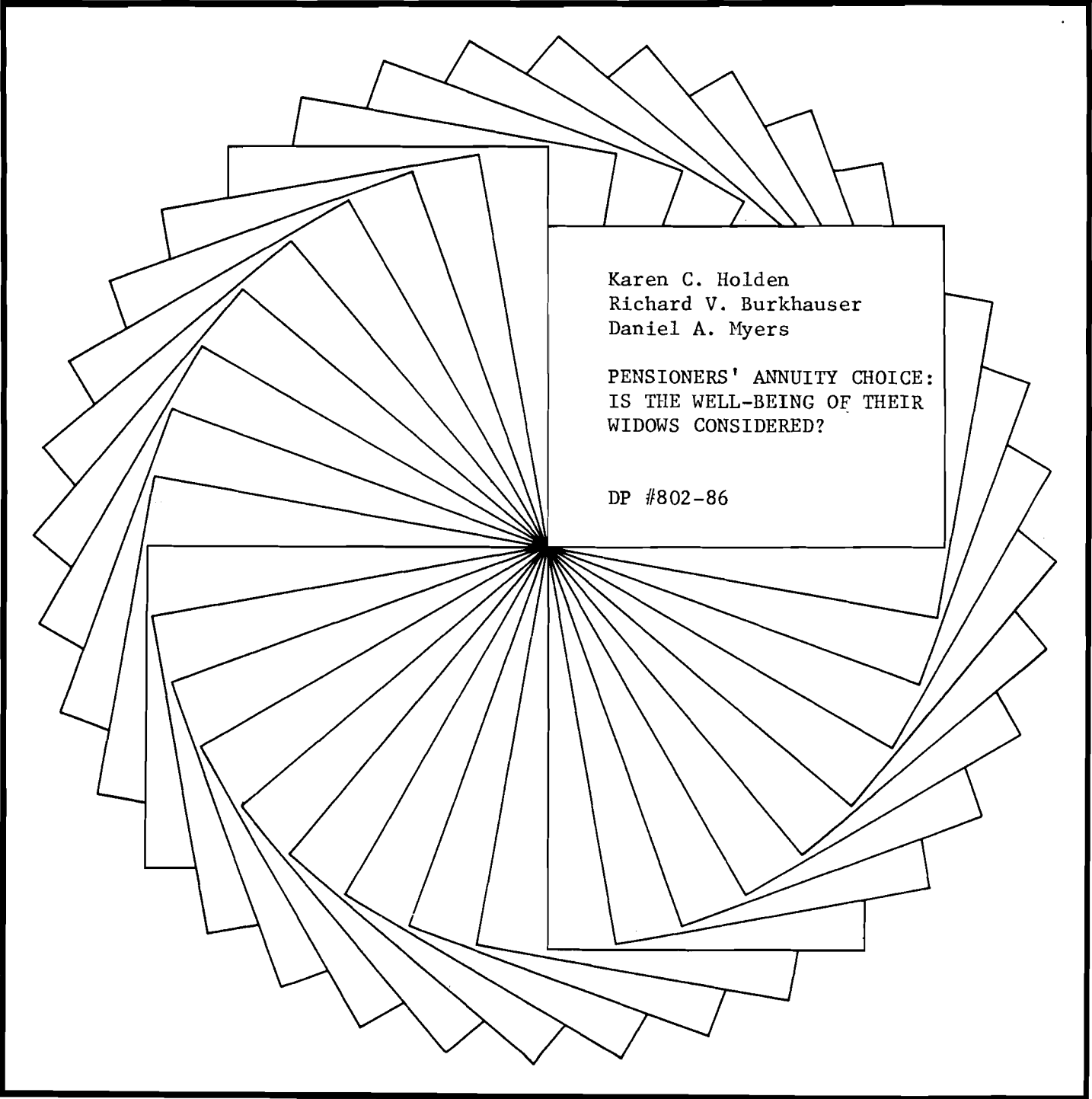

IRP Discussion Papers



Karen C. Holden
Richard V. Burkhauser
Daniel A. Myers

PENSIONERS' ANNUITY CHOICE:
IS THE WELL-BEING OF THEIR
WIDOWS CONSIDERED?

DP #802-86

Pensioners' Annuity Choice:

Is the Well-Being of their Widows Considered?

Karen C. Holden, University of Wisconsin

Richard V. Burkhauser, Vanderbilt University

Daniel A. Myers, Vanderbilt University

April 1986

This work was supported in part by grants from the U.S. Department of Health and Human Services (no. 84ASPE133A) and from the AARP Andrus Foundation. Additional support for computational work was provided by the Center for Demography and Ecology at the University of Wisconsin-Madison. All opinions expressed in this paper are solely those of the authors, and do not necessarily reflect the views of the funding agencies.

ABSTRACT

Recent changes in pension law were motivated, in part, by a serious concern for the aged female poor, many of whom were believed to be poor because their deceased husbands did not, through their annuity choice, insure against their own deaths. It is sometimes argued that, if husbands had chosen an annuity that continued pension payments to their widows, the risk of poverty among older women would have been much lower.

This paper attempts to answer the question of whether husbands neglect the well-being of their widows in deciding the period over which accrued pension benefits should be paid. The theory of annuity choice presented here assumes that the husband chooses the annuity form that maximizes his utility, where the well-being of his widow during her expected widowhood is a component of his utility function. If a husband chooses a joint-life annuity--one in which payments continue to his widow--his income during his joint lifetime with his spouse and during his own widowhood, should he outlive her, will be reduced. The husband must weigh the utility to him of income in each of three possible survival states by the probability of each state occurring.

We find that couples in which the husband chose a joint-life annuity control greater wealth during their joint lifetime, hold more of this wealth in pension assets, and have expected lifetimes that are shorter relative to the expected years of widowhood. Couples who choose a single-life benefit have lower incomes than do couples who choose a joint-life benefit, even though

the choice of joint-life reduces income. Although the choice of a joint-life annuity would clearly increase the well-being of widows who do not now receive survivor benefits, their survivor benefits and income in widowhood would still be significantly lower than those of women whose husbands did actually choose a joint-life pension.

INTRODUCTION

In 1984 over one-quarter of all widows 65 years of age and older had incomes below the official poverty line (U.S. Bureau of the Census, 1985). While far fewer widows are in poverty than were poor twenty years earlier, widows now account for over 50 percent of all the aged poor. Why widows have not shared equally in the reduction in poverty that has occurred among couples over this period is a growing public concern. Because a large number of these widows were not poor while married (Holden, Burkhauser, and Myers, 1986) attention has turned to the decisions husbands make about their consumption and insurance purchases as a source of the inequitable distribution of resources over the life of both marriage partners.

If husbands underestimate the consumption needs of their wives as widows, they may consume resources during their own lifetime such that their widows have less than is necessary to sustain comparable levels of consumption. Because some forms of wealth are wholly owned by the husband and depend upon his survival (e.g., market earnings or non-social security pensions), even the frugal husband will leave sharply reduced levels of wealth to his widow if he had not purchased insurance to cover the loss of his income from these sources.

Only recently has research been undertaken to examine the decisions husbands and wives make at retirement about the distribution of resources over their remaining lifetimes. Hamermesh (1984) and Wolfe (1984) come to contradictory conclusions about the preference of couples for consumption during their joint-life time. Hamermesh

finds that relative to available wealth, couples overconsume in the early years of retirement, responding in later years by reducing consumption. Wolfe appears to contradict Hamermesh by finding no evidence that couples compared to widows choose to spend a higher proportion of annuitized wealth. These differences, however, may be due in part to Hamermesh being able to follow couples over the retirement period, while Wolfe uses cross-sectional data to compare the consumption and incomes of couples and widows.

Additional evidence that couples may underestimate the consumption needs of the eventual widow is presented by Auerbach and Kotlikoff (1985). Following couples in the Retirement History Survey between 1969 and 1971, they find that sustainable consumption streams are sharply lower for widows than they were for these women while married and conclude that in general husbands had failed to adequately insure their widows against the loss of the husbands' income.

Concern about poverty among widows motivated Congress to constrain the ability of married men to elect pensions whose payout ceases at their death.¹ It was argued that encouraging married workers to choose a pension benefit that continues payments to the surviving spouse would improve the well-being of widows, even though at the expense of their income when married. The argument for this legislation was that many older widows might not be in poverty now if at an earlier time their husbands had elected a pension form which provided survivor's benefits to their widows. In the past less than 30 percent of elderly men chose this form of pension payment schedule

(Kotlikoff and Smith, 1983), although Turner (1986) estimates that as many as half of all married men who first received a private pension in 1978 did so.

Little is known about how workers and their wives value different income patterns after retirement and, thus, about the degree to which men consider the probability of their spouse's widowhood in making their annuity option choice. In this paper we present an economic model of the annuity option choice that relates this choice to other economic variables.

MODEL OF PENSION OPTION CHOICE

Our goal is to determine why some workers choose a pension form that pays a benefit over their lifetime and that of their survivor--a joint-life annuity--over the alternative, a single-life annuity that pays benefits over the life of the worker alone. Typically, the annuity choice cannot be formally made until just prior to pension receipt. Although workers making preretirement savings decisions at younger ages may anticipate their eventual annuity choice, it is likely that they do so with a great deal of uncertainty. Accurate predictions about single-life annuity amounts are difficult to make; benefits payable under joint-life options are even less predictable, since they depend upon the mortality experience of the pension plan up to that time and the actuarial subsidies provided to joint-life annuitants. Hence the optimal annuity choice at the time of retirement depends upon characteristics of the worker and spouse at that time and on pension funding decisions that cannot be predicted

in advance. Although total pension wealth may be determined by work and savings decisions throughout a worker's life, we argue that decisions about the distribution of pension wealth over the lifetime of the household after the worker's retirement are made just prior to the time when pensions are first received.

We assume that the worker, in making his choice of annuity payout form, considers the risk of three states occurring after his retirement: joint survival with his wife, his own survival after her death, and his wife's widowhood². The expected well-being of his widow is a factor in his own utility function; his utility is positively related to how well-off she will be both before and after he dies. The husband makes the annuity option choice such that the resulting flow of income over the three household states maximizes his utility. We model this decision by adapting to the annuity option decision a model of life insurance choice developed by Fitzgerald (1983).

Stated formally, at the time he makes his annuity choice the worker chooses an income flow to maximize the following utility functions:

$$(1) V = \sum_{i=1}^T [(1 - q_i)(1 - d_i) U_b(y_{bi}) + (1 - q_i)d_i U_h(y_{hi}) + (1 - d_i)q_i U_w(y_{wi})],$$

where q_i and d_i are the probabilities, respectively, of the husband and wife dying in period i , having survived to the beginning of period i . T is the maximum number of years over which either the husband or the wife will survive after the annuity choice is made at time $i=1$. We assume that neither will live beyond the age of 100. The three possible survival states are specified here and elsewhere by subscripts b, h

and w , where b indicates the period when both husband and wife are alive, h is the period when only the husband survives, and w indicates the period when only the wife survives. U_b , U_h , and U_w are the utility to the husband of anticipated income flows received by himself or his wife, y_b , y_h , and y_w , in each of the three respective states.

The income flows in each state can be defined as

$$(2) \quad y_{bi} = A_i + SS_{bi} + R_i + (1 - r)P_i$$

$$(3) \quad y_{hi} = A_i + SS_{hi} + (1 - r)P_i$$

$$(4) \quad y_{wi} = A_i + SS_{wi} + R_i + sP_i$$

where

A = income from nonpension assets (assumed constant across all states for expositional ease),

SS = expected social security income in the relevant state,

R = wife's own work-related private pension income, and

P = single-life benefit from a private or government pension paid to the husband while he alone is alive.

If a joint-life option is chosen, the husband's monthly benefit may be reduced by some fraction $r > 0$. If joint-life benefits are completely subsidized, $r = 0$. When he dies, his widow will receive some fraction, s , of his single-life benefit amounts.³

To obtain demand equations for survivor pensions, we follow a procedure used by Campbell (1980) and Fitzgerald (1983) and expand the objective function, V , around an income value defined as the income received when no pension income is allocated to the wife's widowhood. Taking the partial derivative with respect to the survivor pension value, and assuming that the simultaneous death in a single period of both husband and wife is unlikely, we derive the first-order and second-

order conditions for utility maximization. If these conditions are met, the following relationship must hold:

$$(5) \sum_{i=1}^T [sq_i U'_w(Y_{wi}) - rd_i U'_h(Y_{hi}) - rU'_b(Y_{bi}) + rq_i U'_b(Y_{bi}) + rd_i U'_b(Y_{bi})] \geq 0$$

where Y_{ji} , $j = b, h, w$, is the income value around which the objective function is expanded. Collecting terms, (5) becomes

$$(6) s \sum_{i=1}^T [q_i U'_w Y_{wi}] - r \sum_{i=1}^T [d_i U'_h(Y_{hi}) + U'_b(Y_{bi})(1 - q_i - d_i)] \geq 0.$$

Equation (6) is the condition that must be met if another dollar of pension income is allocated from a worker's lifetime to that of his widow. The first term is the worker's gain in utility from providing additional income to his widow times the probability of his dying in each period i . This term is larger, the greater is his probability of dying, the greater is the fraction that will be received by his widow of each dollar his income is reduced in the other two states, and the greater is the marginal value to him of insuring her consumption in widowhood. The second term represents the loss in utility due to the income given up over his own expected lifetime, including the period when he alone survives. This loss is affected by the probability of his joint survival with his wife and of his becoming a widower, and by the proportion by which his pension income will be permanently reduced if he were to elect a joint-annuity. If survivor benefits are completely subsidized ($r = 0$), no trade-off in utility need occur, and the largest survivor benefit allowed is chosen. If some price must be paid ($r > 0$), the trade-off is considered in making his choice.

The relationship between the reduction in pension income during the husband's lifetime (r) and the proportion of the husband's pension income received by his widow (s) needs further explanation. In a pension that is actuarially fair for an individual,

$$(7) \quad \sum_{i=1}^T (1 - q_i)P = \sum_{i=1}^T [(1 - q_i)(1 - r)P_i + q_i(1 - d_i)sP_i].$$

In such a case the wealth value of a single-life annuity (that is, one received only when the husband is alive) is equal to the wealth value of the joint-life benefits (that is, the wealth value of the reduced pension received when the husband is alive plus that of the survivor benefit to the widow).

However, even if a pension is fair for the average worker, the equality of the wealth value of alternative income flows will hold for an individual retiree only if his mortality expectations are the same as the plan's average mortality experience. This equality will not hold if the individual's expected mortality differs from that used by the pension plan to calculate the required r^* when s is chosen, or if the pension plan subsidizes s such that $r < r^*$, where r^* is the actuarially fair reduction. This argument is developed further in Appendix A. Here we only point out that in equation (6) r may diverge from the actuarially fair reduction required by some s either because the plan subsidizes the joint-life annuity, or because the worker's or his spouse's mortality diverges from the average mortality experience of the plan. Because the sample of men we analyze all died at relatively young ages, we expect that, if they had anticipated their early death, they would have preferred a joint-life annuity, because, in fact, that choice was subsidized.

Equation (6) is an intuitively appealing condition for the optimal allocation of income over the remaining lifetime of the couple. If one interprets the two terms as the utility of discounted value of future income flows over the probable time spent in each state, this condition means that, when a worker makes the annuity choice, he evaluates the net increase in his utility due to his allocating resources from his lifetime to that of his widow. Assuming well-behaved utility functions, this condition implies that the greater is the share of total household wealth already allocated to a given state, the smaller is the net gain in utility from transferring additional wealth to that state.

The principal hypotheses we will test concern the effect of the household's portfolio of assets (including pension wealth) on the annuity choice. We expect that the worker will be more likely to choose a joint-life annuity under the following initial income conditions:

1. the smaller is the wealth value of his widow's income relative to his during his remaining lifetime;
2. the smaller is the share of total wealth accounted for by nonpension assets that can be bequeathed to his wife;
3. the greater is the divergence between the probability of his leaving a widow and that of the average worker.

The empirical specification of the model is

$$(8) \quad \Pr(s > 0) = X'B.$$

The probability of a worker choosing a joint-life annuity is a function of a vector X of independent variables hypothesized to affect

the net change in the husband's total utility from allocating an additional dollar from his lifetime to his widow's. We estimate this function on a sample of married men who received a pension prior to their death.

DATA

The data we used is from the Retirement History Survey (RHS), a longitudinal survey of the retirement process conducted by the Social Security Administration during the period 1969-1979. An initial sample of over 11,000 household heads--single men and women and husbands of couples--aged 58-63 in 1969 were interviewed every other year during the decade (Ireland, 1976). We limited our sample to married couples in 1969, since for other household types the pension option choice would not be a relevant issue. For widowed women in 1969 no information on deceased spouses' incomes was collected, and therefore it was impossible to infer either the pension option choice of their deceased husbands or their wealth prior to death.

The sample of 1969 couples was further restricted to the relevant universe of men who actually received a pension some time during the survey period. It is these men who faced the pension option choice.⁴ Because the RHS did not ask men what type of annuity option they chose, we had to construct this variable. We know who received pension income, but not whether it had been reduced by the choice of a joint-life option. We can infer this choice from data on the income sources of the widow, since widows were asked about the source of their pension income. From their answers we can identify

widows who received pension income from a deceased husband's pension. Because we needed information from the widow to identify the annuity option choice, only couples in which the husband died during the survey period and in which the widow continued in the survey for at least one period are included in our sample.⁵ Finally, we excluded couples in which the husband survived his wife, since we are unable to identify the pension option choice of these men.

Our model hypothesizes that the relative wealth value of income flows during the husband's lifetime and that of his widow determines his annuity option choice. For this reason we estimated social security and pension wealth values during the couple's lifetime states. This is a fairly straightforward calculation for social security wealth. Actual social security earnings records are appended to the RHS.⁶ In addition we know that social security is a joint-and-two-thirds annuity (that is, benefits to the survivor are two-thirds of those going to the couple when both are alive). Hence, we can easily assign the relevant income across the household states.⁷

Pension benefits were more difficult to assign. We know the value of benefits received when the husband was alive and we can determine whether pension benefits were received by the widow after his death. But we do not know the actual joint-life annuity form chosen or the rules regarding the potential subsidy to the joint-life option. Hence for men who took a joint-life pension we must assume a subsidy rule and a rule stating what proportion of the pension the survivor received, to separate wealth across states. For men who took a single-life pension we must assume a subsidy rule to estimate the benefits that would have

been paid if the joint-life annuity form had been chosen. In both cases we assumed that benefits were not subsidized and that all joint-life options were joint and two-thirds.

We can only approximate the wealth value of pension benefits for the option not chosen. This is a problem for several reasons. Not all pension plans provide joint-life options on a strict actuarial basis, and not all plans use the same mortality tables in calculating fair pension reductions. Although ERISA legislation and general actuarial practice mandate that the joint-life annuity be at least actuarially equivalent to the single-life annuity, some plans subsidize that option. Because there is no way to identify plans that subsidized the joint-life choice, we may overestimate the cost to some recipients of choosing a joint-life option, and, therefore, overestimate the single-life pension wealth value for men who chose a joint-life annuity. For the same reason we may overestimate the cost of joint-life option for men who chose a single-life option.

The assumption of a joint-and-two-thirds annuity is less of a problem, since in our sample of couples who did choose the joint-life option and in which the widow received pension income only from her deceased husband's pension, the ratio of annual benefits of widows to those of their husbands in constant dollars was .76.⁸ Nonetheless it ignores other possible payout schemes such as lump-sum payments to widows (not identified as a joint-life annuity) and period-certain choices (treated as joint-and-two-thirds annuities).⁹

In calculating wealth values of social security and private pensions, 2 and 5 percent discount rates are used, respectively. The

1969-1979 period was one of rapid price inflation. While many pension plans did have some form of inflation adjustment, this was typically below inflation during this period (Clark et al., 1984). The actual adjustment in pension plans for price increases is not specified in the RHS.

The RHS collected detailed information on holdings of financial, real estate, and business assets in each survey year. With these we estimate nonpension, and non-social security assets in the income year when pension income is first reported by our sample of married men. Because we argue that the annuity option decision is made at that time, this is the appropriate year in which to calculate the portfolio of assets held by couples in our sample.

CHARACTERISTICS OF SAMPLE

There are 305 couples who meet the criteria for inclusion in the sample for whom we had good pension information for the husband, and whose pension option choice we could ascertain with confidence. All were married in 1969 and at some time during the survey period the husband reported receiving pension income. All husbands died before 1979 (the last year of the survey), and the survivor continued in the survey for at least one period as a widow.

Among these couples, 39.3 percent were identified as having elected a joint-life annuity. This is somewhat higher than the 29 percent of all male pension recipients estimated by Kotlikoff and Smith (1983) to elect some type of joint-life option, but below the rate reported by Turner (1986) for 1978. This is not surprising. Most of our sample made their pension choice prior to 1974, when

federal legislation was passed specifying the joint-life as the default option in all pensions. The higher rate than reported by Kotlikoff and Smith is due to the young age and early death of our sample. For these men, the actual wealth value of a single-life was probably lower than for the average worker. If these men had anticipated their earlier death, our model hypothesizes a higher probability of electing joint-life benefits than would have been evident from data on all workers. Means and standard deviations of the independent variables included in our model are given in Table 1.

Our model assumes that the husband is in total control of the annuity choice, a power that was permitted under law. Thus, although the well-being of his wife and widow may affect his decision, it does so through the satisfaction he obtains from her well-being. The husband alone must decide how to allocate his pension wealth over his expected lifetime and that of his widow. In making this choice, he compares the utility he obtains from the income and wealth that affects his well-being over his own lifetime, with the utility he would obtain from allocating some fraction of his pension income to his widow.

His own utility during his lifetime is affected not only by the personal income flows he receives and controls, but by the well-being of his wife as well. When they live together, we assume their resources are shared. Thus, the couple's wealth during their joint lifetime and the wealth value of income flows during his own widowhood determine his level of utility when alive. This utility is compared to the utility he obtains now from the expected well-being

Table 1
Means of Variables

Variable N=305	Mean	Standard Deviation
Joint-life pension(0,1)	.393	.489
Total wealth (\$10,000) ^a		
Pension wealth estimate		
Actuarially fair	14.43	12.79
Subsidized	13.83	12.34
Pension wealth share ^b		
Actuarially fair	.244	.180
Subsidized	.220	.164
Widow wealth ratio ^b		
Pension wealth estimate		
Actuarially fair	.318	.205
Subsidized	.330	.209
Relative length widowed	.739	.265
Years to death	3.3	8.5
Spouse elig. own pension (0,1)	.177	.382

Note: Two methods are used to estimate wealth value of the single-life pension, see text.

^a Total wealth value of all assets over husband's expected lifetime. Includes property, financial holdings, business, and social security and pension wealth.

^b Wealth value of pension divided by total wealth of husband.

of his widow. In determining her well-being after his death, he takes into account the income that she is assured, whatever he may decide.

As discussed in the theory section, we assume an initial wealth in each of the three states. The utility-determining wealth while the husband is alive includes the present value of his future pension income from a single-life annuity. Also included in this wealth are social security benefits paid to him over his lifetime, and all other household assets.¹⁰ When he is alive, his wife's well-being affects his own; hence, the wealth value of her income and assets prior to his death are assumed to affect his utility positively. His widow's wealth includes her social security benefits (based on her own work record or her husband's, whichever gives her the highest benefit) and life insurance benefits received after his death. Because we do not always know the actual amount of her own pension income, we indicate eligibility or receipt with a dummy variable (see note 8).

All assets are those reported in the income year of the survey, when pension income is first reported by the husband. We use two distinct methods of measuring the asset value of the husband's single-life pension. The first is the wealth value of his single-life pension when we assume that husbands who took a joint-life benefit chose an actuarially fair joint-and-two-thirds annuity. This implies that the yearly benefit when he is alive would be higher than the reported amount. The second value is the present value of a single-life annuity when it is assumed that the single-life benefit is

equal to the reported joint-life benefit. This is akin to the value of a pension that fully subsidizes the joint-life choice. We include this estimate of pension wealth as a minimum estimate of the pension wealth of joint-life annuitants and to determine whether we seriously bias our results in the desired direction when pension wealth is estimated by the first method.

The remaining variables are included in our model to capture differences across individuals in the degree to which they prefer leaving pension wealth versus other forms of wealth to their widows. We hypothesize that the larger the share of total wealth the pension is, the more the husband is constrained to taking a joint-life annuity in order to insure his widow against his death. The greater is her wealth as a widow compared to the wealth available during his lifetime, the less is the need for this insurance. In addition, the longer the expected widowhood of his wife relative to his own lifetime, the more years consumption of her wealth must be spread over, and hence the more likely the joint-life choice. Finally, we calculate the actual length of life after the husband first reported pension income. If men in our sample anticipated their earlier death when making the annuity decision, the earlier that death occurred, the more likely will they be to take the joint-life option.

EMPIRICAL RESULTS

Table 2 presents logit estimates of the annuity option choice where the dependent variable is dichotomous with a value of 1 if the man elected some form of joint-life annuity. Wealth values used in

the first estimated model include the estimated single-life annuity value for men who chose a joint-life annuity. This assumes that the pension chosen by joint-life annuitants was joint-and-two-thirds, and that all pensions were actuarially fair on average.

Coefficients on the total wealth variable and on the percentage of that wealth accounted for by the husband's pension wealth are significant and have the expected positive sign. The higher is the total wealth (or possible well-being during his own lifetime), the greater is his willingness to shift income from his lifetime to that of his widow. The greater is the share of that wealth accounted for by pension wealth, the more likely he is to choose a joint-life benefit. We suspect that men whose wealth is primarily pension wealth are constrained by their lack of assets in other forms to electing a joint-life annuity over other forms of insurance against their death. As hypothesized, the longer is his wife's widowhood relative to his own expected lifetime, the more likely he is to choose a joint-life annuity.

The other three independent variables have no significant effect on the annuity choice. The relative size of his widow's wealth has no effect; neither does a dummy measuring whether or not the wife is eligible for a pension based on her own market work. Husbands do not appear to anticipate their early death, and the coefficient has the unexpected sign (positive). However, because all men in our sample died within nine years after their pension started, this variable cannot reflect the possibly important difference between men who expect to have longer or shorter lifetimes than the average man of their age.

Table 2
 Determinants of Joint-life Annuity Choice
 (logit results; t-statistics are in parentheses)

VARIABLES N=305	Pension Wealth Value	
	Actuarially Fair	Subsidized
Constant	-2.933 (4.789)	-2.326 (4.079)
Total wealth(\$10,000) ^a	.042 (2.811)	.031 (2.228)
Pension share ^b	4.383 (5.546)	2.726 (3.519)
Widow wealth ratio ^b	-.178 (.248)	.025 (.038)
Expected widow/husband life	1.097 (2.209)	1.115 (2.348)
Years to death	.006 (.367)	.006 (.384)
Spouse elig. pension(0,1)	.043 (.126)	-.008 (.023)

Note: For the two methods of estimating the pension wealth value of the single-life pension, see text.

^a See note a in Table 1.

^b See note b in Table 1.

Because we worried that our method of calculating pension wealth might bias our results in the desired direction (i.e., systematically overestimating the pension wealth value for joint-life annuitants), we estimated wealth using reported pension values of men who had joint-life annuities. This method should underestimate the difference in wealth between husbands who elected a joint-life annuity and those who elected a single-life annuity. These results are reported in the second column of Table 2. Although the effect and significance of the coefficient fall somewhat, not surprisingly, because we have reduced variation between the two groups, the effect of the variables remain significant at least at the 5 percent level.

INCOME AND WEALTH OF JOINT- AND SINGLE-LIFE ANNUITANTS

We have shown that the pension option choice can, in part, be explained by economic characteristics assumed to affect the relative gain to the husband from allocating some of his pension income to his widow. In this section we show what difference this choice makes in the relative well-being, first, of couples who chose a single-life benefit, and of widows of men who chose the single-life option.

Table 3 shows the relative income of the two groups of annuitants both before and after widowhood. Note that those who chose a joint-life annuity are significantly better off than the single-life recipient households in both states. In the first year of pension receipt, when all the men were alive, couples who had elected a joint-life annuity had incomes 29 percent higher than those who elected a single-life option, even though the pension income of those

selecting joint-life was most likely reduced by that choice. In 1978, when all men in our sample had died, the mean income of widows whose husbands did elect a joint-life annuity was 57 percent above the mean income of other widows.¹¹

In addition to having lower income both before and after widowhood, couples who elected the single-life annuity also suffered a greater percentage fall in income between the time they received a pension as a couple and the last survey year (1978), when only the widow was alive, than did couples who elected the joint-life option. The income received by widows of single-life annuitants fell by 53.1 percent; that of joint-life annuitants' widows fell by 43.5 percent. It is true that the receipt of a survivor benefit would have reduced this fall for the single-life group. However, because it would also have reduced their income when married, it would have increased the difference in the incomes of the two groups of couples prior to the husband's death.

One reason for the lower income of those who chose a single-life annuity was that the husbands' pensions were less valuable. Even without an actuarial decrease, their yearly benefit when married was only \$2,782, while the joint-life average was \$4,346. If the single-life annuitants had, instead, received an actuarially fair joint-and-two-thirds annuity, their benefits when married would have fallen to \$2,018. In this case, survivor benefits paid to their widows would have increased the widow's income by \$1,346, but this increase would still have been significantly lower than the \$2,897 survivor benefits estimated for the widows of men who were in fact joint-life recipients. Hence, couples who

Table 3

Income of Couples (and Widows) Who
Did and Did Not Elect Joint-Life Annuity

Annual Income (\$)	Single-Life	Joint-Life	T-Value
Household income			
First year of pension	\$13,347	\$17,467	-2.30**
Last survey year(1978)	6,250	10,047	-3.29***
Husband's pension income			
Actual benefits	2,782	4,346	-3.44***
Other option ^a	2,018	6,147	-8.27***
Widow's survivor benefit			
Actual benefits	00	3,721	-11.04***
Estimated ^b	1,346	2,897	-5.80***

^a Estimated single-life and joint-life benefits, respectively,
based on assumption of actuarially fair joint-and-two-thirds option.

^b Estimated joint-life survivor benefits for both groups based on
assumption of actuarially fair, joint-and-two-thirds option.

* significant at 10 percent level.

** significant at 5 percent level.

***significant at 1 percent level.

elected a single-life annuity would have had lower pension benefits both prior to and after the husband's death than did those who elected a joint-life even if their husbands had made a different choice.

PUBLIC POLICY IMPLICATIONS

We have presented estimates of the effect of economic variables on the joint-life annuity choice. This investigation was undertaken to help answer the question of whether husbands consider the well-being of their widows when making that choice. We used data from the RHS to ascertain why some men chose a joint-life annuity and others did not. Although the RHS does not identify the pension option choice, we were able to estimate that choice if the husband died prior to 1979 and the widow was in the survey for at least the first survey year of widowhood, when questions were asked of widows about insurance and pension receipt because of the death of their husband. This limited our sample to a group of men who retired relatively early and whose deaths occurred soon thereafter. Whether or not these are representative of all men with pensions is not clear.

Our results indicate that the choice is not a random one. Couples in which husbands choose a joint-life annuity have greater wealth and the husbands' pensions are a larger fraction of this wealth compared to couples in which the husband chooses a single-life annuity. In addition, men appear to take into account the probable length of widowhood of their wives; men who have younger wives are more likely to insure against their own death. This suggests that the pension option choice is not an arbitrary one. Men take the well-being of their widows into

consideration to some degree. Nevertheless, it can still be argued that greater concern must be given to future widows. The resources that are available to the widow in her own right after her husband's death appear to have no effect on the joint-life decision. In addition, widows of men who choose a single-life pension are significantly worse off than are widows who received a pension benefit after their husband's death.

Before advocating greater restrictions on the single-life choice of married men, it is helpful to consider that the annuity choice affects the well-being of couples over their lifetime, not only during the period after the husband's death. Couples in which the husband does not allocate pension income to the widowhood of his wife tend to have smaller incomes during their joint lifetime, to have significantly smaller pension benefits both absolutely and relative to their total wealth, and to have wives whose expected period of widowhood is shorter. Even if the husbands had chosen a joint-life pension, their widows would have had significantly lower income than did the widows of men who actually made that choice. It is, therefore, possible that the choice of a joint-life option is not optimal for all couples when their well-being over their lifetime is considered. Relatively low-income married couples may prefer somewhat higher income during their (relatively longer) joint lifetimes, even though a survivor's benefit would significantly improve the well-being of the eventual widow.

Appendix A

When r diverges from the actuarially fair reduction.

First simplify (7) such that

$$(9) \quad r^* = s \sum_{i=1}^T [q_i(1 - d_i)/(1 - q_i)].$$

Since $r < \text{or} > r^*$ by, say, some factor m such that $r = mr^*$, then for each individual we can write (8) such that

$$(10) \quad r = ms \sum_{i=1}^T [q_i(1 - d_i)/(1 - q_i)]$$

where m is a factor indicating the degree to which the individual's expectations differ from that of an actuarially fair system. If $m < 1$, r is smaller than the actuarially fair amount that would make the individual indifferent to the choice of a single or joint-life annuity. This would be the case if the joint-life option is subsidized, or if the individual's own expectation of death in any period is greater than that assumed by the pension plan. If $m > 1$, the survivor's pension is either less than the actuarially fair amount (illegal under ERISA) or the individual's own expectation of survival is greater than the average worker under the plan.

Substituting mr^* for r in equation (6),

$$(11) \quad s \sum_{i=1}^T [q_i U'_w(Y_{wi})] - mr^* \sum_{i=1}^T [d_i U'_h(Y_{hi}) + U'_b(Y_{bi})(1 - q_i - d_i)] \geq 0,$$

we see that, for any value of s , the optimal annuity choice is determined, in addition, by subsidization of joint-life annuities, and

the extent to which the retiree's own estimated probabilities of death diverge from the mortality of the average annuitant.

Notes

¹ Legislation that, in general, was not in effect at the time the data we use was gathered has increased protection to widows of pensioners. The Employee Retirement Income Security Act of 1974 (ERISA) required that a pension must offer a joint-life annuity, and that this must be the default pension if married workers did not choose otherwise. This annuity must be at least the actuarial equivalent of a single-life annuity. Further, the benefit amount paid to the survivor under the joint-life annuity must be at least one-half the monthly joint-life benefit paid to the retiree, where the latter is calculated according to actuarial tables (though the plan need not, in fact, reduce retirees' benefits by the full amount). It is important to note that ERISA does not mandate that all married participants choose the joint-life option. However, it encourages that choice to some degree, since a joint-life annuity must be paid unless the employee specifically elects otherwise. Although ERISA permitted workers to waive a joint-life annuity without notifying their spouse, the Retirement Pension Equity Act of 1984 requires that both spouses must now sign if a joint-life annuity is declined (Andrews, 1985).

² We use masculine pronouns for workers in this paper because our data allow us to examine this choice for males only. When couples were interviewed in the Retirement History Survey (RHS) the husband was the primary respondent, and less information was collected on his wife prior to his death. In addition, the debate over the effect of allowing

married workers to opt for a single-life annuity is in terms of male workers and their widows; widowers appear to be less of a concern.

³ The survivors benefit is typically stated as some fraction k of the joint-life benefit paid to the worker. Thus $sP_i = k(1-r) P_i$. We have posed our model as if a joint-life annuity is the only way of bequeathing pension income to a widow. It is possible in some plans for retirees to elect a lump-sum distribution of their accrued pension benefits. These could then be bequeathed to the widow exactly as could other financial assets, implying little difference between pension wealth and other forms of wealth. In fact there is an important difference in that pension plans typically use higher interest rates to calculate the present value of pensions for lump-sum distribution than they do to calculate required reductions in benefits with a joint-life annuity (Siegel and Buckman, 1982). For most retirees it would be impossible to buy in the market a single-life annuity equal to the present value of their future pension income, or to purchase from their higher single-life benefits an annuity for their widow equal in present value to survivor benefits under a joint-life pension option. Virtually no men in the RHS received a lump-sum distribution; the few that did are excluded from our sample. However, the same principles apply to women; the value of a lump-sum distribution of their survivor's benefits would have been below that of the present value of the expected income flow. For this reason we model the annuity option choice as a choice separable from other insurance decisions and treat lump-sum distributions upon widowhood as distinct from the annuity choice.

⁴ Our model of joint-life annuity choice assumes all workers in our sample could make such a choice. In fact, at the time that most men in our sample would have made this decision, the choice was not yet mandated. ERISA was passed in 1974; the mean year in which pension income was first reported by men in our sample was 1971. Although pension plans were not required to offer a joint-life option, in fact, most plans did (Bell and Graham, 1984). Because at the time of the survey the single-life option was more likely to be the default pension form, men in our sample may have had to explicitly choose the joint-life option. In addition, under ERISA and prior to the Retirement Equity Act of 1984, it was legal for survivor benefits to be denied to survivors of active, vested workers who died prior to retirement, even if they were then eligible for a pension. For this reason we required all men in our sample to report pension income prior to their death. Receipt of a pension by the husband prior to his death and by the widow were both necessary to define a joint-life annuity.

⁵ Single-life annuitants include men whose widows received a lump-sum distribution from their husband's pension. Many plans pay to the widow a lump-sum equal to the difference between the total contributions paid by the worker and benefits paid prior to his death. These are most often paid when workers die early in retirement. For this reason, we thought it most likely that women receiving lump-sum payment were widows of single-life annuitants. These women are more like widows whose husbands clearly did not elect a joint-life annuity. When we excluded these widows from our sample,

our results did not change.

⁶ In calculating social security benefits we use the benefit rules that were in effect at the time the husband made the pension option choice. Even if these rules changed before younger retirees began receiving social security benefits, we assume that in making the annuity decision men estimated future social security benefits according to rules that were in effect at the time the annuity decision was made.

⁷ This is true if the couples' benefits are based entirely on the husband's covered work record. For these couples, payments during their joint-life are based on his work, and are akin to a pension payment, even though some portion of those benefits are paid directly to the wife. After his death, the widow receives an income equal to two-thirds of their combined benefits. If the wife receives a retired-worker benefit that is higher than her spouse benefit or widow's benefit, her benefits upon widowhood may be less or greater than their combined income when married. Nevertheless, social security is structured as a joint-and-two-thirds annuity, since she is eligible for that amount as a wife and widow unless her own retired worker benefits are higher. Social security departs from private pensions in that retirees' benefits do not increase if they cannot take advantage of the survivorship provisions.

⁸ When widows receive income from more than one pension, the RHS does not identify the separate amount from each pension. These women,

however, do answer a question about the number of pensions they receive and whether one is because of their husband's death. Some widows do receive two or more pensions. While we can identify the type of pension received, we cannot always identify the pension amount received from each pension. In addition, we have no information on survivor pension amount for women widowed late in 1978 or early 1979 (the last survey year), since no survivor pension income could have been reported in 1978 when she was still married. These widows are included in our sample because we know their husband's benefit amount and that their husbands had opted for a joint-life annuity. However, we cannot identify the survivor benefit amount. Dual pension receivers and 1979 widows were a substantial enough proportion of our sample that we chose to estimate survivor pensions for all sample members.

⁹ Period-certain annuities guarantee payments over a stated number of years after retirement. If the pensioner dies before that period expires benefits will be paid to the survivor for the remaining number of years. Because the maximum number of years a woman in our sample could be widowed is nine, it was impossible to identify men who chose a ten-year certain annuity, and possible only if the man died early in the survey, to identify those who elected a five-year certain annuity. Turner (1986) reports that 41.5 percent of men electing a pension in 1978 chose a joint-life annuity and 16.6 percent chose a period-certain option.

¹⁰ Wealth includes all financial and physical assets (including a house) held by husband or wife. It is sometimes difficult to separate holdings of the husband and wife in all survey years. Because the husband's well-being is determined both by his solely held assets and by those shared with his wife when they are married, this treatment is probably not inappropriate. It is true, however, that we may underestimate the wealth assured to the widow and overestimate his wealth as a widower if certain assets are under her sole control and could be bequeathed to persons other than her husband.

¹¹ In 1978 not all widows of couples were still in the sample, and women had been widowed for a different number of years. The second part of this project examines how the annuity choice affects income changes over time as women become widowed.

REFERENCES

- Andrews, E. 1985. *The Changing Profile of Pensions in America*. Washington, D.C.: Employee Retirement Research Institute.
- Auerbach, A.J. and Kotlikoff, L. J. 1985. *Life Insurance of the Elderly: Adequacy and Determinants*. Working Paper No. 1737. Cambridge, MA: National Bureau of Economic Research.
- Bell, D., and Graham, A. 1984. *Surviving Spouse's Benefits in Private Pension Plans*. *Monthly Labor Review*. April, pp. 23-30.
- Campbell, R.A. 1980. *The Demand for Life Insurance: An Application of the Economics of Uncertainty*. *Journal of Finance* 35:1155-1172.
- Clark, R., Maddox, G., Schrimper R., and Sumner, D. 1984. *Inflation and Economic Well-being of the Elderly*. Baltimore, Md.: Johns Hopkins University Press.
- Fitzgerald, J.M. 1983. *Life Insurance Demand and Bequests in a Household with Two Earners: Model and Evidence from a Sample of Married Couples*. Ph.D. Dissertation. Department of Economics, University of Wisconsin-Madison.
- Hamermesh, E.S. 1984. *Consumption During Retirement: The Missing Link in the Life Cycle*. *Review of Economics and Statistics* 66(1):1-7.
- Holden, K.C., Burkhauser, R.V., and Myers, D.A. 1986. *The Dynamics of Poverty among the Elderly: Income Transitions at Older Stages of Life*. *The Gerontologist*. (forthcoming)
- Irelan, L.M. 1976: *Retirement History Study: Introduction*. In: *Social Security Administration, Office of Research and Statistics, Almost 65: Baseline Data from the Retirement History Study*. Research Report No. 49. Washington, D.C.: USGPO.
- Kotlikoff, L., and Smith, D. 1983. *Pensions in the American Economy*. Chicago, Ill.: University of Chicago Press.
- Siegel, M., and C.I. Buckman. 1982. *Executive's & Professional's Guide to Pension and Retirement Benefits*. New York: Harcourt Brace Jovanovich.
- Turner, J.A. 1986. *The Economic Risk of Long Life: Is Mandatory Survivors Insurance Needed?* Paper delivered at the Annual Meeting of the Midwest Economic Association (mimeo).
- U.S. Bureau of the Census. 1985. *Technical Paper 55. Estimates of Poverty Including the Value of Non-cash Benefits: 1984*. Washington, D.C.: USGPO.

Wolfe, J. R. 1984. Providing Adequately for Widows: Do Intact Couples Overconsume? Paper Delivered at the Atlantic Economic Conference (mimeo).