Retirement Income for Surviving Spouses

This paper reports on a study of married participants in the Oregon Public Employees Retirement System (PERS) to gain information about their retirement decisions. The study used four mail-in questionnaires in conjunction with computerized participant data. This study looks beyond the status of the couple immediately following retirement and attempts to forecast the well-being of the household, i.e., the surviving spouse, when and if a retiree predeceases the spouse. As indicated by research in labor economics, all income streams are converted to an asset or wealth variable for analysis.

The results indicate that, assuming no depletion of savings by long-term illness, 65 percent of the couples can expect adequate monthly income during their retirements. Only about one-third of the participants elected any form of joint-and-survivor payout that assures lifetime income to the spouse. Significant drops in income are expected to occur in these households following the death of the retiree as average life insurance holdings are not adequate to replace the predicted drops in pension and social security payments. Overall the spouses of those who purchased life insurance could expect equivalent levels of income after the death of the retiree; however, the variance was higher among this population.

The paper concludes with a discussion of the implications for the pension plan and its sponsors when a high level of popularity is observed for private alternatives. The changes spurred in Oregon's Public Employee Retirement System as a result of this investigation also are reported.

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By law, pension plans that provide retirement benefits in the form of annuities (usually monthly payments) must offer survivor benefits. Alternatively, some argue that life insurance can be a better way to support the surviving spouse of a public pensioner who elects the higher monthly payment available from a single life annuity. This approach — sometimes referred to as “pension maximization” — has appeared in many states and is being marketed to public personnel and pension managers with increasing vigor. This article presents results gathered in a recent survey to learn more about the decisions made by a group of retiring public employees with respect to their pension plan options and alternative sources of income for surviving spouses. A population of workers making decisions among alternative sources of income for their spouses in the event of death was identified through counsellors and administrators at the Oregon Public Employees Retirement System (PERS).

Alternative Sources of Income for Surviving Spouses

The objective of this study was to examine the financial decisions of retiring workers and the level of support expected to be available to surviving spouses of those retirees. This study intentionally looked beyond the financial status of the couple immediately following retirement and

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attempted to forecast the financial well-being of the household, i.e., the surviving spouse, when and if a retiree predeceases the spouse.

We examine two alternatives that are commonly available to provide income for a retiree's spouse should that retiree predecease the spouse were examined. Effective with the *Retirement Equity Act of 1984*, qualified pension plans must offer as an automatic form of benefit a qualified joint-and-survivor (QJS) annuity.¹ The principal alternative to the joint-and-survivor annuity offered by a pension plan is a capital sum that can support the spouse. This capital may be provided either through a refund guarantee on the annuity or through the private purchase of a life insurance policy. Life insurance is increasingly being sold to support the surviving spouse of a pensioner who elects a single life annuity — an approach sometimes referred to as “pension maximization.” Other authors have described the use of life insurance in this manner.² Such a purchase can, in some cases, increase a retiring couple's wealth beyond what could be achieved by electing a joint-and-survivor annuity. The life insurance policy's benefits (either through a lump sum or annuitized payout) the provides the capital that is needed to support the survivor.

Of those retiring from the Oregon Public Employees Retirement System in 1989, 26.5 percent elected the single life annuity; another 43.2 percent elected a refund annuity that provides cash if the retiree dies in the first few years but provides nothing after annuity payments exhaust the retiree's original account balance.³ A third and final option for a retiree, though no longer available unilaterally to most retirees, is to make no explicit provision for the possibility of a spouse surviving longer. This “do nothing” strategy may be appropriate in some cases, such as retirees who have no spouse or whose spouse is entitled to a pension in his or her own rights and the best joint decision is determined to be two single life pensions. The single life annuity also is quite appropriate if a retiree's spouse is in ill health and expected to die first.

Sources and Types of Data

PERS has administered benefits since 1946. Over 900 public employers, including all state agencies, all school districts in Oregon, the majority of cities, counties, and other political subdivisions, participate in PERS. PERS is the retirement program for about 95% of state and local governmental employees in Oregon. The pension benefits offered to participants in the Oregon Public Employees Retirement System require employees to contribute to the plan. Specific features of the retirement plan are constant across all participants:

1. Normal retirement age and automatic payout option

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2. Benefit payout options available: single life annuity, joint life annuity, lump sum, "pop-up," and refund options
3. No provision for integration with Social Security

The resulting benefit structure is fairly typical for public plans⁴ though the political nature of the public employee plan in Oregon has produced an unusually complex benefit design. The employee entitled to the highest benefit amount determined under several different formulas, including a defined benefit formula with a three-year final average salary component.⁵ Accumulated sick leave serves to substantially increase the benefit payable to some employees.⁶

Participant Data

Retiring workers of the Oregon Public Employees Retirement System (PERS) and their spouses who began the process of deciding to retire about February 1, 1990 and later retired during 1990 became the study population. As the primary objective of this study was to learn more about the income levels available to surviving spouses of retired workers, the study included exclusively married couples. Data focused on the retirement decision and alternative sources of income for surviving spouses. The state has computerized retirement records, as do about 40% of public sector employers.⁷ To begin we collected from PERS a set of 26 variables for each individual participant in electronic form. These included: date of retirement, gender, type of employer, elected retirement option, health insurance carrier, date of birth and death (where applicable), employment dates, annuity contributions to a variable annuity fund, adjusted monthly salary, and benefits amounts under all PERS payout options.

Four mail-in questionnaires were employed to gather information about the financial options perceived by retiring workers and their spouses, the decisions they were making, the reasons behind those decisions, and the roles played by financial planning professionals. An original population of 452 married couples who returned the pre-retirement survey yielded a useable sample of 440 couples and represented over 12.0 percent of those who scheduled retirement counseling sessions. Each partner completed a questionnaire prior to retirement, and a similar questionnaire was sent by PERS to each partner after retirement in 1990. Of the 2136 PERS participants who retired during this study, 218 couples returned the post-retirement instrument. Information collected over the period consistently indicated that approximately 40% of PERS participants who received counseling were not married.

Data were examined for non-response bias. The sample accurately represented the total PERS population across income levels, gender, and type of employer (state agency, school district, and municipality), even though it was limited to participants whose retirement decision and act of

retiring occurred in 1990. Analysis of information on all non-participants compared to participants revealed that the only difference was age: Mean age of non-participants was 58.1 years; participants' mean age was 60.5 years. Based on the verbal reports of counselors, it is believed that younger people who came in for information from counselors declined to participate in greater numbers (1) because of the longer period remaining to retirement and their feelings that the study would not accept their responses due to this time span or (2) because they had not yet gained a comprehensive grasp of their intentions and readiness for retirement. Even when willing to participate, their responses could be useful only in providing cross-sectional information for the pre-retirement survey. Since their retirements would not have occurred within the 12 months following their counseling session, nonparticipation by this group does not affect results based on both the pre- and post- surveys.

Variables Derived from Raw Data

Several new variables were computed that the literature and other sources led us to believe might better explain the variation among members of the study population. The most important of these derived variables and the methods used to develop them are described below.

Asset Values for Income. Annuity factors were applied to convert income streams to asset or wealth values. The income streams to which this conversion applied included 1) the income amount needed, 2) the income amount provided from Social Security, and 3) the income amount provided by PERS. This conversion was clearly indicated by research by economists that show improved results when a worker's retirement decision is viewed in this light rather than as a choice between two different levels of income. This study, then, treats pension rights as an asset whose value changes with the age of retirement⁸ with WEALTH defined as the present discounted value of the benefit stream(s):

$$WEALTH(s) = \sum_{i=s}^T \frac{(P_i B_i(s))}{(1+r)^i}$$

where p_i is the probability of living through period i , r is the discount rate, T is the age at which the probability of survival drops to zero, and $B_i(s)$ is the annual benefit associated with a pension accepted in period s . This is the same definition of wealth used by Burkhauser and Quinn (1983a, 1983b) when they measured, for Social Security and employer pensions separately, the incentives for retirement income.⁹ Survival probabilities were based upon the 1983 Group Annuity Mortality Table.¹⁰

Inflation explicitly was considered in the annuity factors used. The level of retirement wealth needed was computed assuming future inflation of 5% per annum. Social Security benefits were assumed to grow at the same 5% rate. The cost-of-living feature provided to PERS beneficiaries was assumed to average 3% over the life of today's retirees.¹¹ All annuity factors assumed future interest rates to be 7.5%, a moderate interest assumption and appropriate in this case because that is the rate used by the actuaries of the PERS plan in determining its benefits.¹² Computation of a single annuity factor that incorporated both growth factor (g) and inflation (i) produced a straight life annuity formula with a discount factor (d) of 2.38%. Annuity computations using a discount factor of 4.37% were employed to convert the income from PERS with its smaller cost-of-living raise.

Illness Index. An illness index was created that averaged the responses to four different survey items:

- how many times the respondent reported having been seen by a physician in the previous twelve months because of illness;
- how many times the respondent reported having been hospitalized for illness in the past three years;
- response, ranging from "strongly agree" to "strongly disagree" to the statement "My health is excellent;" and
- spouse's response, ranging from "strongly agree" to "strongly disagree" to the statement "My spouse's health is excellent."

Responses for the last two items were reverse coded so that a higher score corresponded to poorer health. The scores for all four variables were standardized to give each item equal weight, and then they were combined. If more than two items were missing, ILLNESS was considered to be missing.

Replacement Ratio Needed at Retirement. An explicit measure of the level of income or wealth needed was developed in order to better measure each household's decisions against its own needs. The traditional measure for this is replacement ratio, i.e., the proportion of pre-retirement income required to maintain the same standard of living after retirement. Only two published studies have provided updated targets for replacement ratios since the implementation of the 1986 *Tax Reform Act*.¹³ While the results of both studies are comparable, neither published replacement ratios entirely appropriate for the population of married persons used this study. Upon request, however, Boone & Company,¹⁴ was able to provide unpublished replacement ratios for that population along with the needed additional details about assumptions used in their computations. These

unpublished, married-couple ratios, illustrated in Figure 1 as a percentage of gross pre-retirement income, were used to develop retirement income targets in this study for the two-person household immediately following retirement. Figure 2 shows the resulting distribution of replacement ratios for the levels of household income reported by the population in the PERS study.

Figure 1: Replacement Ratios Required for Married Couples to Maintain the Same Standard of Living

Figure 2: Distribution of Replacement Ratios Required for the Population of the PERS Study

Replacement Ratio Needed at Retiree's Death. The level of income needed to maintain the same standard of living after the death of the single retiree is less than the amount needed when two people were living in the household. A survey of the literature concludes that for households with

no children, 36.8% of the household's expenditures are non-divisible with each spouse consuming 31.6% of the remaining amounts. The factor derived indicates that support following the death of one spouse requires 68.4% of pre-death income.¹⁵ Estimates prepared in this study adopt this result and assume that 68.4% of post-retirement income is needed following the retiree's death to maintain the same standard of living. The amount of income needed by participants in this study, determined in this way, ranged from \$7,603 to \$57,291 and averaged \$22,755 (in 1990 dollars).

Adequacy of Retirement Savings. After converting all income streams into wealth values and establishing the target level for retirement income, a comparison was made between the amount available and the amount needed. A simple ratio

$$\text{Adequacy} = \frac{\text{Amount of Retirement Wealth Available}}{\text{Amount of Retirement Wealth Needed}}$$

was used to measure adequacy of retirement savings. This ratio was developed both for the couple at retirement and for the surviving spouse after the death of the retiree. ADEQUACY1, computed first, included guaranteed monthly payments but excluded most forms of personal savings. A similar variable, ADEQUACY2, was computed to include personal savings amounts and life insurance. Two distinct variables were used in order to increase understanding of the need for and role of personal savings.

Results: Less Financial Certainty for Surviving Spouses

Using the ADEQUACY1 variable, 65 percent of the public-employee couples on average in this study had adequately financed their retirements.¹⁶ The mean of ADEQUACY1 was 142 percent; the range was from 24 percent to 554 percent.

The use of wealth values in preparing the results in the previous paragraph necessarily combine the periods of retirement before and after the death of the first spouse. In breaking the results into these two distinct periods, however, we find the level of financial security for surviving spouses was somewhat lower than was available for couples immediately following retirement. Surviving spouses of retired employees can expect to receive income from several sources, including some sources that assure the income will continue for life and others that provide no such guarantee. The sources considered in this study to provide lifetime income include: beneficiary payments from the retiree's annuity, payments from one's own pension plan, and Social Security. Sources considered as not necessarily providing lifetime income were personal savings and life insurance poli-

cies. Figure 3 outlines the sources of income for the surviving spouse, explicitly separating sources that guarantee a lifetime income from other sources.

Figure 3: Sources of Surviving Spouse Income

As shown here, the amount available from lifetime income streams declines with income. This is to be expected given the nature of the Social Security benefit formula. Perhaps more importantly, however, overall adequacy also declines with income. Personal savings contribute the most to maintaining the standard of living of those individuals with pre-retirement income in the \$45,000-\$60,000 range. The personal savings of families with larger incomes do not keep pace with the larger amounts of retirement income needed to maintain their standards of living. On average, life insurance of these families is insufficient to contribute significantly to the wellbeing of the surviving spouse.

Income Expected from Retiree's Annuity

The pension plan by which this study's participants are covered, like most others, offers payout options that provide protection for the surviving spouse at one of three different levels:

1. A lifetime annuity either reduced or unreduced in amount from that received before the retiree died.

2. Additional payments of capital to support the spouse for a limited period of time. The 15-year guarantee annuity, as the name implies, would provide temporary payments over the remainder of the a 15-year period should the spouse die within 15 years following retirement; the refund annuity provides a capital sum that decreases monthly and typically is exhausted in eight to ten years.

3. Nothing.

Consolidating the results obtained for 435 respondents and reducing the twelve options available into these three categories shows that they were about equally divided among these three levels:

- ✓ 32.9% (143) of the surviving spouses will receive a lifetime annuity should their spouses predecease them. Of those, 44.1% will be unreduced annuities and 55.9% will be reduced to half of their former level;
- ✓ 32.6% (142) will receive additional payments or a sum of capital if their spouses should predecease them within a limited time period; and
- ✓ 34.5% (150) will receive no additional PERS benefits if the retiree predeceases the spouse.

Spouse's Pension Rights

Another source of lifetime support for a surviving spouse is a pension benefit earned by that spouse. As two-earner households have become increasingly common, a widespread expectation is that the financial security during retirement of each spouse will depend less on the work history and pension rights of the other spouse. Previous studies have not adequately answered the question of how rapidly the dependency that characterized the past will disappear. Currently retiring people are, after all, products of past and not current generations. Therefore, it is important to ascertain whether and how much the two-pension family is representative of today's retiring employees.

Data from this study indicated that, overall, today's retirees, and therefore the next generation of surviving spouses, depend almost totally on the pension rights earned by one spouse. Despite having worked an average of over 30 years, only 56% of the spouses in this study had earned a pension in their own right. However, of the average \$1,813 total monthly pension benefit available to 102 retiring couples of this survey, only 18% of that amount was from the spouse's pension. For the subset of that population where the spouse was entitled to a pension benefit (n=42), the average monthly benefit was somewhat higher at \$2,441 and on average

43.7% (\$1,067) of the couple's monthly benefit stems from the spouse's pension.

One other possible source of retirement income to a surviving spouse, for persons who had been married before, accrues from pension rights of a previous spouse. While 95 retirees (11.2%) and 107 spouses in this sample (24.1%) indicated that they had been previously divorced, a total of only 3 persons (1.4%) indicated that their former spouses are entitled to any of their pension benefits. No further consideration was given to this possible source of income.

Spouse's Social Security Rights

In addition to private pension benefits, the retiree's spouse is entitled to Social Security benefits. The amount that will continue is 66.67% of the pre-death amount for couples whose benefit is based on the lifetime earnings of one spouse; the reduction could be as high as 50% if both spouses had equal earnings during their working lives. While the rules determining Social Security benefits are complex, the reduction of benefits for the surviving spouse will always be in the relatively narrow range between 33% and 50%.

Data from the PERS survey indicate that most spouses had worked for pay an average of 30 years. Most of the spouses in this study would, therefore, be eligible for Social Security benefits on the basis of their own work history. Overall estimates discussed in this section were based on a reduction of 50% because spouses had significant working lives and because that is consistent with the assumptions implicit in the replacement ratios described above.¹⁷

Personal Savings

In some cases additional income was available from personal savings. In order to conservatively measure the adequacy of retirement savings, it was assumed that those couples whose retirement income stream is inadequate to provide the level of income needed will spend savings dollars to maintain that general standard of living. The proceeds from life insurance policies were not included as personal savings but rather were assumed to be available to provide for a surviving spouse. Based on this rationale, high and low estimates were prepared for the availability of personal savings to a surviving spouse. The resulting estimate of the highest level of savings available, which assumes that no savings are spent for such extraordinary costs as medical expenses, involved the following three adjustments to the savings available at retirement:

- Non-insurance savings available at the beginning of retirement, excluding a home, were reduced by an amount sufficient to provide needed retirement income during the retiree's life expectancy.
- The remaining non-insurance savings amount was further reduced by \$3,786, the average cost for funeral expenses.¹⁸
- To this savings amount the face amount of life insurance was added. While undoubtedly some life insurance will be voluntarily canceled and/or payout elected under a reduced living benefit option, no way exists to estimate this factor.

For only 37.6% of couples did the higher estimate of savings—the most that is likely to be available to support the surviving spouse—remain positive. The average level of support available to surviving spouses, considering all sources and including this high estimate, is 115.7% of the amount needed; the median value is 81.9%. In all, only 36.2% of surviving spouses would have adequate income if all of their savings remain intact.

The low estimate assumes that all personal savings other than life insurance are spent before the retiree dies, and thereby assumes that the spouse depends solely on lifetime income sources and for life insurance. The low estimate recognizes that the savings of the couple (the center area in Figure 3) may be significantly diminished by medical expenses associated with the retiree's final illness. If that illness should require prolonged care, it is possible that the savings of the couple will be totally depleted by those care expenses. While data contradict the popular view that spending down to Medicaid is the norm for patients entering nursing homes as private payers,¹⁹ the possibility of savings being wiped out by a prolonged illness is very real. For the PERS population, eliminating personal savings means reducing from an average 115.7% adequacy to 77.6% of the amount needed to support retirement from the high estimate or best possible situation. The proportion of surviving spouses having adequate income drops from 36.2% to 16.5% if all non-insurance savings are depleted.

Life Insurance

Life insurance takes on special importance for the surviving spouses, because it is a form of savings that is not likely to be spent before the retiree's death. After clarifying some data by telephone interviews,²⁰ it was estimated that 81 of 218 retirees (37.2%) have some life insurance, and that the amount of their coverage, on average, was \$53,407. These numbers differ substantially from 84% of couples in the wide-ranging Retirement History Study who report some life insurance and their average holdings of \$9,360.²¹ The details offered in the following section show that this difference is explained by the "pension maximization" phenomenon.

Since life insurance is a special form of asset for surviving spouses, it was important to evaluate the strategy of using life insurance specifically to provide income for them. This section looks further at the results of the PERS Study with respect to life insurance issues:

- the level of life insurance carried by these retirees
- the extent to which additional life insurance is being used to protect the surviving spouse
- the success of this protection function of life insurance²²

Choices among the three possible pension payout options, presented in Table 1, were related to life insurance activity. The elections of individuals who purchased insurance were significantly different than the group overall ($n = 204$; $p < .001$), with a much smaller proportion electing the lifetime income option.

Table 1: Options Elected by Retirees						
Option	Retirees who did not consider insurance		Retirees who did consider insurance		Retirees who purchased insurance	
	Number	%	Number	%	Number	%
Lifetime Income Option	26	35.1	25	26.3	9	14.5
Temporary Guarantee Option	26	35.1	33	34.7	25	40.3
No Income Guarantee for Spouse	22	29.7	37	38.9	28	45.2
Total	74	99.9	95	99.9	62	100.0

In the pre-retirement survey, 54.9% of respondents ($n=432$) indicated that they had considered life insurance. Those who considered insurance were, on average, wealthier ($n=169$), with the mean wealth for those who did consider insurance at \$487,513 and for those who did not at \$429,477 ($p=.032$). The amount of insurance considered was also positively correlated with wealth (correlation=.254, $p<.05$, $n=43$).

It was believed that retirees who considered life insurance were consulting PERS counselors sooner and would, therefore, be thought to spend more time planning their retirements. Of 295 individuals expecting to retire before December 31, 1999, those who had considered private insurance had an average of 1.72 years ($s = 1.93$) remaining to retirement while those who had not considered insurance had an average of 1.31 years ($s = 1.38$) remaining to retirement. Since the variances of these two groups could not be considered equal, statistics relying on separate variance estimates were produced. The differences are significant at the .05 level with a resulting two-tail t -value of -2.16 ($p < .05$).²³

Several other differences also were noted about the individuals who considered the insurance alternative. Younger persons had considered insurance ($p < .01$), men had considered insurance 60% of the time compared to 26.7% of the time for women ($p < .001$), and those PERS retirees who considered insurance were more healthy, that is less ill (ILLNESS mean = -.201), than those who did not consider it (ILLNESS mean = .036) ($p < .05$). This may indicate that retirees are performing some self-underwriting, i.e., they are less apt to believe they can be covered by life insurance if their health is poor.

Of those who considered life insurance (69.2%), those who actually purchased it were younger ($\bar{x} = 58.5$ years) than those who did not ($\bar{x} = 59.7$ years) ($p < .05$). The authors believe that price increases observed for life insurance with increasing age and the possibility of greater difficulty meeting underwriting requirements leads to fewer retirees buying it. The mean amount of life insurance considered was \$93,000 and ranged as high as \$400,000. The policies considered were described as 53.4% whole life; 25.0% universal life; and 21.6% "other." No differences were observed in the purchase rate by age, sex, income, spouse's pension benefit, years with present spouse, or health.

The two most important factors for deciding to purchase life insurance were to secure income for a surviving spouse and to ensure a predictable retirement income. It therefore seems that the retirees were indeed using the insurance to supplement their employer's benefits package (as well as Social Security).

Discriminant analysis was used to identify the variables that are important in distinguishing among the individuals who considered life insurance and who purchased life insurance. This statistical technique takes linear combinations of the independent variables to form an equation which in turn classifies individuals into two distinct groups. Independent variables were selected to enter the discriminant analysis equation on the basis of their discriminating power.

In order of their appearance through this stepwise process, the only variable significant in classifying an individual as to whether they had considered insurance ($CONS_{INS}$) was the size of the employer's monthly pension benefit ($PERS\$$). The unstandardized equation for considering life insurance is

$$CONS_{INS} = -1.5656 + .00113 PERS\$$$

For the PERS study and using only this one variable, 63.7% of individuals ($n=215$) were correctly classified as to whether they had considered insurance. This proportion is somewhat remarkable because retirement decisions generally incorporate so many factors and have proven difficult to explain consistently in prior studies. Variables reflecting retirement age, wealth, gender, illness, number of children, education, spouse's pension, use of professional advisers, all risk preferences²⁴, and the stated importance of spousal influence on retirement decisions were not significant. Furthermore, this function proved stable when tested using three separate random 75% samples. Each of the three samples resulted in $PERS\$$ being the first and only variable to enter the equation. On average 62% of cases were correctly predicted in the remaining 25% holdout sample, a result very close to that achieved when using the entire sample.

A discriminant analysis function also was computed to classify individuals who actually purchased life insurance as an alternative to joint-and-survivor benefits from the pension plan. In order of their appearance through the same stepwise process described above, the variables significant in classifying an individual as to whether they had purchased insurance ($PURCH_{INS}$) as a supplement to the employer's retirement benefits package were:

- the size of the pension benefit expected from employer ($PERS\$$)
- the priority given by the retiree to assuring that spousal income would be unreduced in the event of the retiree's death ($RSKPREF7$)

The risk preference variable was the indicated preference in a rank ordering of seven alternatives. Thus, a smaller number indicates a stronger preference and the negative sign of its coefficient indicated a direct relationship rather than an inverse one. The unstandardized equation for classifying participants as to whether they purchased life insurance is

$$PURCH_{INS} = .4171 - .3636 RSKPREF7 + .00082 PERS\$$$

For the PERS study and using only these two variables, 70.0% of individuals ($n=130$) were correctly classified as to whether they had purchased insurance. Variables reflecting retirement age, wealth, gender, number of children, education, spouse's pension, use of professional advisers,

ers, all other risk preferences, and the importance of spousal influence on retirement decisions were not important. Also of note is that the importance ranking given by retirees to “maximizing spousal income” was one of only two variables to prove significant in the discriminant analysis used to categorize the purchasers of life insurance. The significance of a stated risk preference illustrates the importance of attitudes as well as “hard facts” in describing retirement behaviors.

Once again, the function proved stable when tested using three separate random 75% samples. For each of the three samples, PERS\$ entered the equation first; two out of three achieved their strongest explanatory power by adding only one additional variable—RESULT7. The actual cases predicted in the remaining 25% of cases were 71.4%, 66.7%, and 78.8% respectively for an equation that on average correctly predicted the purchase decision of the individual 72.3% of the time.

Effect of Life Insurance Purchase on Retirement Income of Surviving Spouses

The amounts of life insurance owned by those who had purchased a pension maximization policy was substantially higher than those who had not ($n=219$). The mean amount of insurance coverage for those who had not purchased additional insurance in preparation for retirement was \$9,388. This result is remarkably near the national average of \$9,360 as reported in the Retirement History Study.²⁵ The average amount of insurance owned by those who did purchase life insurance at \$60,977 was significantly higher ($p.001$).

On average the 44 people who purchased life insurance as a source of future income for their spouses had a higher level of finances available for those spouses than the 174 who did not purchase life insurance as they approached retirement. The mean of the adequacy variable for those who had not purchased insurance was 97.5% while those who purchased insurance had 187.7% of the amount needed to provide spousal income. The difference is significant ($p<.01$). As a source of income for surviving spouses that could supplement the employers, benefits, therefore, it seemed to be effective. The income amounts estimated to be available from life insurance, which factor in the ages of the two spouses as well as insurance amounts, varied similarly. Those who did not purchase specific life insurance for spousal support will have income of \$1,553 available annually from life insurance; those who did purchase insurance will have \$7,366 available ($p<.001$) from that source. Overall, then, private life insurance combined with other sources of income — primarily the employer’s benefit package and Social Security — is expected to provide adequate future income for surviving spouses.

Review of Important Findings and their Implications

Using average values, the couples in the population of the PERS study will find their retirements well financed, with monthly income sources exceeding the levels needed to sustain the pre-retirement standard of living. The employer's benefits provided an average of 44.0% of the income needed, Social Security another 68.6%, and spousal pensions 16.0%. Clearly the sum of these three figures exceeds the 100.0% value that would indicate a minimum but adequate level of finances. These mean values do not tell the whole story, however. Assuming no depletion of savings by long-term illness, we found that 65 percent of the couples can, on average, expect adequate monthly income during their retirements. Statistically, there was no difference in the adequacy of the surviving spouse's support depending on the type of pension payout selected for PERS benefits, though greater variance was observed among households electing a single life payout. While the spouses in this study had worked on average 30 years, the pensions earned in their own right still played only a modest role in assuring their future financial security.

In addition to the employer-provided benefits and Social Security, the total retirement package for about one-third of the sample purchased life insurance as a means of providing financially for the surviving spouse, and significantly more men than women considered insurance. This shows that these retirees probably did worry about their spouses, should they die before them. Overall, however, life insurance holdings are small, and if the couple's savings are depleted by the final illness of the retiree, the survivor's income could be expected to be lowered to an average of 77.6% of the spouse's needed sum.

The purchase of life insurance by a significant majority of those who consider its purchase implies at least two important messages for pension plan sponsors and their advisers. First, the popularity of private alternatives implies a growing impact on the actuarial performance of the pension plan, and plan sponsors must expect some employees to find the private life insurance alternative to their benefit. The pension plan is required by law to treat all employees as "average," while the private insurance market actively underwrites its risks and aggressively reflects differences among individuals in its pricing structure. Specifically, the healthiest employees and those employees whose spouses are in the poorest health can be expected to select against the pension plan; the resulting increase in the election of straight life annuities by the healthiest employees presages the need for an increase in annuity prices for that plan. Likewise, the selection of joint-and-survivor annuities where spouses are in better health will diminish the conversion factors used in determining a couple's monthly benefit, a change that also corresponds to an increase in annuity prices. The extent of such adverse selection upon employer-funded pension plans

could be minimized by using joint-and-survivor annuity factors that are actuarially "fair," i.e., those containing no subsidies across employees of different ages. The significance of the illness index in categorizing individuals as to whether they considered private alternatives underscores the existence of such adverse selection. Resulting increased prices could contribute to additional adverse selection in a spiral manner.

Next, plan sponsors must expect employees to ask increasingly often about the advisability of the private insurance alternative. This obviously puts the employer in a difficult position since most public employers decline to provide advice on the election of a retirement payout option. As the issue works to a resolution, the wise plan sponsor will seek ways to inform employees about how to make an objective comparison without the assistance of the employer. The retirement systems serving California, Colorado, and Oregon public employees have issued brochures or worksheets designed to assist the employee in making an informed decision. Another alternative directs employees to advisers qualified to make such a recommendation; however, many employers also fear the liability associated with such a referral.

Epilogue

The attention of this research to the mechanisms chosen by retirees to provide for their spouses triggered a re-examination by the actuaries for Oregon's Public Employee Retirement System of the factors they use in setting benefits for spouses. That re-examination uncovered substantial changes in mortality patterns and produced what appeared to be a dramatic improvement in benefits under spousal protection options. To ascertain the extent of that impact, the new factors were applied to the retiree population of the PERS study. Had time stood still for these people (i.e., their ages and incomes remained unchanged as of June 1, 1992) on average, their decisions might have been different from those reported here. The payout option that assures continuation of 100% of the pension check as lifetime income is less expensive than it used to be. A retiree electing that payout option today will receive an average of about 15% more per month for life than a similarly situated employee whose election occurred before June 1, 1992.

One moral of the story is that pension maximization sales are attractive to large numbers of employees only if they make economic sense. That economic viability must come either from lower prices for the same protection or lower expenses on the part of the life insurance company. A public pension plan that is the target of heavy pension maximization activity should look for clues as to why competition is causing this to happen: implicit subsidies that favor one group over another or outdated mortality

statistics with which insurance companies using current data can effectively compete. Fortunately, there are viable alternatives strategies that public personnel systems can use.

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Notes

¹ A QJS annuity pays a benefit for the life of the participant with an additional benefit—the survivor annuity—payable for the life of the participant's spouse. The survivor annuity must be not less than 50 percent of nor greater than the annuity payable during the joint lives of participant and spouse. The spouse annuity must be continued even if the spouse remarries. The joint-and-survivor annuity must be at least the actuarial equivalent of the plan's normal form of benefit. The qualified joint-and-survivor form must be offered automatically to a married participant at retirement. The participant may elect to receive another form of benefit if the plan so provides; however, the spouse must consent in writing to the election, and the consent form must be notarized or witnessed by a plan representative. These requirements apply to private pension plans; the public plan that was the subject of this study voluntarily followed a similar procedure. For further details, see Allen, Everett T. Jr., Joseph J. Melone, Jerry S. Rosenbloom and Jack L. VanDerhei. *Pension Planning*, 6th edition. Homewood, IL: Richard D. Irwin, 1988, 99-101.

² Brainard, C. H., and Blair M. Lord. "Joint and Survivor Annuity Options under State Employee Retirement Systems: The Risk of Beneficiary's Prior Decease." *CLU Journal* XXXIV, No. 3 (July, 1980), pp. 17-23.

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⁵The precise set of applicable formulas depends upon the employee's period of service and specific grandfather provisions in the law.

⁶A program somewhat similar operates in Illinois and was described by Lucia E. Peek, Nancy E. Smith, and Charles C. Gilbert in "State of Illinois Sick Leave Incentive Policy: University Employees' Dysfunctional Behavior," *Public Personnel Management*. 20, 2 (Summer 1991), pp. 171-180.

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¹⁰Society of Actuaries. "Development of the 1983 Group Annuity Mortality Table." *Transactions of the Society of Actuaries* 35 (1983), pp. 859-899.

¹¹The first 2% of a retiree's cost-of-living increase is virtually automatic with increases of greater than 2% granted periodically with the approval of the Oregon Legislature. An average increase of 3% is consistent with the plan's history.

¹²This assumption also contributes to the generalizability of the results as 7.5% is the median interest rate used in single-employer plans with 100 or more employers whose plans include a pay-related benefit.

Turner, John A., and Daniel J. Beller (eds.) *Trends in Pensions*. Washington, D.C.: U.S. Department of Labor. 1989, p. 413.

¹³In addition to the research adopted in this study, see Palmer, Bruce A. "Tax Reform and Retirement Income Replacement Ratios." *Journal of Risk and Insurance*. 56, No 4 (December, 1989), pp. 702-725 and Palmer, Bruce A. "Income Replacement Needs of Retirees," American Risk and Insurance Association, San Diego, CA, 1991.

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¹⁵Martin, Gerald D. *Determining Economic Damages*. Santa Ana, CA: James Publishing Group, 1990, §510-520.

¹⁶This corresponds closely with the first-round survey responses that indicated 63.3% (n=436) of couples expected to save some of their retirement income.

¹⁷For their two-income calculations, replacement ratios in the study by Booke & Company, Consultants/ Actuaries® assumed that each spouse earned half of the total household income.

¹⁸Lino, Mark. "The \$3,800 Farewell." *American Demographics* 12, no.7 (July, 1990), p. 8.

¹⁹Spence, Denise A., and Joshua M. Wiener. "Estimating the Extent of Medicaid Spend-down in Nursing Homes." *Journal of Health Politics* 15, no. 3 (Fall, 1990), pp. 607-626.

²⁰The researchers experienced some difficulty measuring the levels of life insurance among this PERS population. Because it was believed that many people had reported their policy's face amount where the questionnaire asked for cash value, telephone interviews were performed with most of the people indicating the presence of life insurance. Other changes were introduced to the data where stated values were deemed impossible. For example, where a policy's face amount was stated to be less than its cash value, the face amount was adjusted upwards.

²¹Auerbach, Alan J., Laurence J. Kotlikoff. "Life Insurance of the Elderly: Adequacy and Determinants" in Gary Burtless (ed.) *Work, Health, and Income Among the Elderly*. Washington, D.C.: The Brookings Institution, 1987. p. 239.

²²See Nielson for a discussion of which groups of retirees are most likely to benefit from life insurance. See Nielson, Norma L. and Arnold F. Shapiro. "Pricing the Surviving Spouse Risk at Retirement: Some Actuarial Considerations." Working paper, 1992, traces these benefits to differences in the mortality and interest rates used in pricing insurance and annuity products.

²³Since adding back the handful of employees whose retirement is expected after the year 2000 washed out the significance of these results, the researchers have concluded that employees are contacted about the private insurance alternative within less than ten years of their expected retirement.

²⁴One objective of the study was to determine, at least in part, the relative importance of various elements of uncertainty among near-retirement workers and to measure how this uncertainty affected the choice of pension payout options and the decision to purchase life insurance at retirement. Respondents ranked the following assurances (risks) from most to least important:

Choice 1: Assure that my income will grow with inflation during all the years of my retirement.

Choice 2: Assure that, if my spouse dies first, I don't pay the rest of my life for a benefit we'll never use.

Choice 3: Assure that the amount of income I/we receive each year in retirement is predictable.

Choice 4: Assure that I earn the highest possible return on our retirement savings even if the timing of income is not always predictable.

Choice 5:Assure the highest possible income in the years right after I retire.

Choice 6:Assure that there are no "surprise" expenses.

Choice 7:Assure that, if I die first, my spouse's income will not be reduced.

The range of responses on each of these choices was from one to seven, i.e., each item was most important to some retirees and least important to others. It has usually been assumed that public sector employees are more risk averse than private sector employees. See Siegel (1989).

²⁵Auerbach and Kotlikoff, p. 238.

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