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### Disciplines

Economics

### Comments

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# **Forecasting Retirement Needs and Retirement Wealth**

Edited by Olivia S. Mitchell,  
P. Brett Hammond, and Anna M. Rappaport

Pension Research Council

The Wharton School of the University of Pennsylvania

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## Chapter 7

# **Prospects for Widow Poverty**

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David R. Weir and Robert J. Willis

One important challenge for aging policy in the United States is the high poverty rate of older women living alone. A recent survey found that elderly single women were the poorest group among the aged, the only group with poverty rates significantly higher than the population as a whole, and a group much worse off (in relative terms) than older single women in other countries (Holtz-Eakin and Smeeding 1994). These findings come after decades of significant progress during which poverty rates declined for women in all marital status groups. Nevertheless, poverty persists, particularly among nonmarried women (see Table 1). Divorced women fare worst of all, suggesting that attention to the economic consequences of divorce should be a concern for aging policy. Nevertheless, our attention here is on widowhood: nearly half the elderly poor are widowed women and their poverty rates are substantially higher than for widowed men.

Financial arrangements made during marriage can largely determine the relative prospects of husbands and wives in the event of a spousal death, and before these women were widows, they were wives. The widespread availability of life insurance offers a contract mechanism whose purpose is to reduce the differences in economic status between marriage and widowhood, whatever the composition of other financial resources available to the couple. The fact that so many couples are not poor, but so many widows are, raises questions about how couples make financial decisions prior to one spouse's death.<sup>1</sup> Of course the problem is not limited to the poor: earlier research found that many wives at all levels of income faced reduced living standards in the event of their husbands' deaths (Auerbach and Kotlikoff, 1987). The impact of widowhood on economic status thus raises important questions of public policy. For example, some propose redistributing social security benefits toward widows and away from married couples (Burkhauser 1994; Sandell and Iams 1997). Such reforms would be self-defeating if couples responded to them by reducing life insurance, savings, or other private financial provision for widows.

TABLE 1: Poverty in the Population 65 and Older by Sex and Marital Status, 1994.

<i>Marital Status</i>	<i>Population 65+</i> <i>(thousands)</i>		<i>Fraction of Poor</i> <i>(%)</i>		<i>Share of Elderly</i> <i>Poverty (%)</i>	
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>
Married	9735	9735	4.8	4.0	13.0	13.0
Widowed	1755	8636	12.2	20.0	5.9	48.4
Divorced	681	1091	16.5	25.3	3.1	7.7
Never-married	543	768	18.0	28.7	2.7	6.1

*Source:* Authors' calculations using data reported in Grad (1996).

In this chapter we examine the financial situation of married couples with special attention to the life-contingency structure of the various assets that comprise couples' wealth. The data come from the Health and Retirement Study (HRS), a survey that provides unusually detailed information on family finances (see Chapter 1). We focus here on 3,362 married women who were age 51–61 in 1992. All statistical results are weighted by the women's person-level sampling weight in the HRS to ensure that the results are nationally representative.

After describing the methods used to construct household wealth measures, we then compute how much would remain after the death of the husband or the wife, if that death occurred immediately. Next we convert wealth in each of the three possible surviving states into the sustainable annual consumption (annuity) that the couple or widow(er) could achieve. The results are then compared with earlier research on the adequacy of provision for prospective widows. We also compare survivors' sustainable consumption levels to poverty thresholds. This then indicates potential poverty rates in each survival state.

## **The Wealth of Married Couples**

The standard problem in retirement planning is to provide for a relatively smooth lifetime consumption stream drawing on a varied mix of income sources and savings. An important source of uncertainty in this planning problem is uncertainty regarding age at death. In the case of a single decision-maker, the role of life insurance and life annuities in responding to that uncertainty has been extensively examined (Yaari 1965; Fischer 1973; Lewis 1979; Bernheim 1991). By contrast, we ask here how uncertainty over the timing of spousal deaths complicates the problem of smoothing income for a married couple, and how life insurance can assist in that contingent allocation.

Previous research by Auerbach and Kotlikoff (1987, 1991) has taken a related tack in assessing the "adequacy" of life insurance purchases. Those

authors offered an intuitively appealing assessment of a couple's financial situation, by investigating the sustainable level of consumption per person while married, and comparing it with the sustainable level of consumption available to a widow following her husband's death. Our methods are similar, with some improvements made possible by the strengths of the HRS data. First, we convert a couple's claims to future income such as social security or labor earnings into assets, by computing their expected present discounted values (i.e., discounting by both an interest rate and the probability the person survives to receive the income). These assets are then combined with other net worth to arrive at the couple's total lifetime wealth. This wealth stock is then converted to a sustainable consumption level by assuming the purchase of actuarially fair life annuities, a process that translates an initial stock of wealth into a constant flow of income until death.<sup>2</sup>

### Conventional Assets (Net Worth)

We begin by examining the most familiar component of wealth, namely, net worth. This is the value of all real and financial assets owned by a couple, less their debts; it includes net housing equity, stocks, and savings accounts. One strength of the HRS interview design is its persistence in inquiring into the value of conventional assets. Respondents who declined to give dollar figures were then asked follow-up questions in the form of "brackets" to place the amount of holdings into ranges of values. As a result, the HRS obtained a more complete and accurate accounting of wealth information than most other surveys (Smith 1995). Because these conventional assets are not contingent on survival, we assume that they are 100 percent heritable between spouses.<sup>3</sup> In terms of their ability to provide consumption, therefore, these assets afford a greater consumption stream to a single survivor than to an individual while married (since we assume the assets are shared).

### Present Value of Future Income in the HRS

A household's wealth also includes claims to future income. We measure this wealth for HRS women as the expected present discounted value of these future income streams. From the standpoint of a married couple, there are three possible future states in which income might be received: while both are alive, when only the husband survives, and when only the wife survives. The life-contingency of a particular type of future income is defined by the state or states in which it is payable. The generic form of such a present discounted expected value calculation is:

$$PV_i = \sum_{t=0}^T Y_{i,t,s} * P_{t,s} * (1+r)^{-t}$$

where  $Y_{i,t,s}$  is income from source  $i$  in year  $t$  in survival state  $s$ ,  $P_{t,s}$  is the probability that a couple is in survival state  $s$  in year  $t$ , and  $r$  is a real interest rate (which we assume throughout this chapter to be three percent).

Given the way many income flows are structured, it will be useful to refer to three general types of life-contingent income streams. Single-life annuities are received over the life of an individual and do not depend on the partner's survival. For example, the husband's expected future earnings constitute the main component of wealth that is contingent on the husband living but not on the wife's survival. The other two types of contingent claims involve both spouses' survival probabilities in combination. Joint life annuities are those streams paid to the couple only while both partners survive. Survivor annuities are streams payable to a surviving partner only after the death of the other spouse. All other types of life-contingent future claims can be represented as some combination of these three types. For example, a "joint and survivor" annuity that pays one dollar while the couple survives, fifty cents to a surviving widow, and one dollar to a surviving widower is a combination of a one-dollar joint life annuity, a fifty-cent widow annuity, and a one-dollar widower annuity.

To estimate survival probabilities, we use the Social Security Administration's single-year-of-age life table projections for single-year birth cohorts by sex (Bell, Wade, and Goss 1992). Using this, we assign a mortality schedule based on his or her year of birth for each individual in the HRS. In this chapter we do not consider other determinants of differential mortality.<sup>4</sup>

Next we calculate present values for future earnings, pensions, and social security payments. Briefly, future earnings are projected using workers' current earnings and their expected future labor force participation rates. Pension wealth is similarly derived from respondent reports of their pension eligibility and expected accruals. Social security wealth is based on the Earnings and Benefits File (EBF), a restricted data supplement produced by Mitchell et al. (this volume) using Social Security Administration records linked to the HRS sample. We made imputations for respondents lacking records. To convert wealth into consumption annuities we use the same life tables as those used to convert income into wealth.

## **Empirical Wealth Estimates of Couples and Potential Widows**

### *Married Couples*

Summary characteristics for the various components of couples' wealth appear in Table 2 for the 3,362 married couples with age-eligible wives in wave 1 of the HRS, weighted by the wife's person-level sampling weight.



TABLE 2: Characteristics of Couple Wealth (HRS age-eligible wives)

<i>Component of Wealth</i>	<i>Mean (\$)</i>	<i>Share of total</i>	<i>Median (\$)</i>	<i>Coeff of variation</i>	<i>Gini</i>	<i>Share of top 10%</i>	<i>Percent zero</i>
Housing	80326	0.10	60000	1.37	0.52	0.34	0.11
Non-housing	230958	0.29	71000	2.46	0.74	0.61	0.04
H DC now	15892	0.02	0	4.44	0.92	0.88	0.75
W DC now	4596	0.01	0	5.77	0.95	0.96	0.83
H DB now	34565	0.04	0	2.40	0.86	0.71	0.75
W DB now	3408	0.00	0	6.63	0.98	1.00	0.96
SS to date	162846	0.21	173170	0.33	0.18	0.15	0.02
H DB to date	36641	0.05	0	3.23	0.88	0.78	0.72
W DB to date	18075	0.02	0	5.97	0.92	0.90	0.79
H earn future	115263	0.15	75754	1.38	0.61	0.40	0.28
W earn future	55882	0.07	28633	1.46	0.65	0.41	0.38
SS future	10234	0.01	4876	1.36	0.65	0.42	0.35
H DB future	8343	0.01	0	3.36	0.89	0.81	0.74
W DB future	5342	0.01	0	3.28	0.91	0.88	0.80
H DC future	4675	0.01	0	5.09	0.94	0.93	0.82
W DC future	1286	0.00	0	5.60	0.95	0.99	0.89
Total	788333	1.00	604864	0.94	0.38	0.30	0.00
Assets	311284	0.39	148500	1.93	0.63	0.51	0.03
Pensions	132823	0.17	61615	1.73	0.67	0.46	0.27
Social security Earnings	171145	0.22	129878	1.09	0.52	0.33	0.14
Owned	331772	0.42	165000	1.87	0.62	0.49	0.02
Promised	217561	0.28	191777	0.79	0.29	0.25	0.01
Expected	239000	0.30	190880	0.92	0.45	0.30	0.05

Source: Authors' calculations from HRS data.

Notes: H = husband; W = wife; DB = defined benefit; DC = defined contribution; SS = social security.

The top panel of Table 2 gives a detailed decomposition of the different components, while the second and third panels summarize in alternative ways. Total wealth averaged \$788,000, with a median of \$605,000. Although the minimum was a substantial negative amount, there were very few couples with nonpositive amounts of total wealth. Wealth is unequally distributed, with 30 percent held by the top 10 percent and a Gini coefficient of .38.

The leading components of wealth are nonhousing conventional assets (29 percent), social security wealth (21 percent), expected husband's future earnings (15 percent), housing equity (10 percent), and wife's expected future earnings (7 percent). All private pension sources combined amount to 17 percent. As might be expected, wealth components are more unequally distributed than the total. Compare housing and nonhousing

TABLE 3: Correlations Among Components of Couple Wealth

	Total	Housing	Financial	Social Security	Husband Pension	Wife Pension	Future SS	Husband Future
Total	1.00							
Housing	0.34	1.00						
Financial	0.85	0.19	1.00					
Social security	0.18	0.14	0.11	1.00				
Husband pension	0.36	0.12	0.08	0.08	1.00			
Wife pension	0.21	0.03	0.02	0.06	0.06	1.00		
Future social security	0.22	-0.04	0.02	-0.12	-0.00	0.04	1.00	
Husband future	0.57	0.10	0.21	-0.01	0.21	0.02	0.40	1.00
Wife future	0.26	0.02	0.04	-0.01	0.00	0.13	0.43	0.15

Source: Authors' calculations from HRS data.

Notes: N=3,362 married couples with age-eligible wives. Correlation coefficients weighted by wife's person-level weight (inverse of sampling probability). Pension wealth includes pensions already claimed or credited. Future wealth includes expected future earnings as well as future contributions or credits to pensions. See also Table 2.

wealth, for example: both have median values near \$65,000, but ownership of nonhousing wealth is more concentrated and its mean is therefore much larger. Pensions are also unequally distributed, even when summed over the different types. By contrast, social security is distributed more equally than total wealth.

The bottom panel of Table 2 divides wealth into three categories: assets owned outright or already paying annuitized income, promised future payments based on past contributions (primarily social security and pensions), and expected future payments that depend on future work effort. In this cohort, the share of wealth dependent on future work is still quite large, at 30 percent.

Another way in which the components of wealth contribute to the inequality of total wealth is through their pattern of correlation, as shown in Table 3. Most of the correlation coefficients are positive, suggesting very little compensating variation in the components of wealth between categories, between spouses, or even between past and future. The rich are apparently consistently rich. This can be seen in Figure 1, which shows the composition of wealth by decile of wealth. Conventional assets increase with decile of total wealth, as does pension wealth and expected future earnings. Social security increases rapidly through the 70th percentile and then remains roughly constant. Thus, social security is like other components of

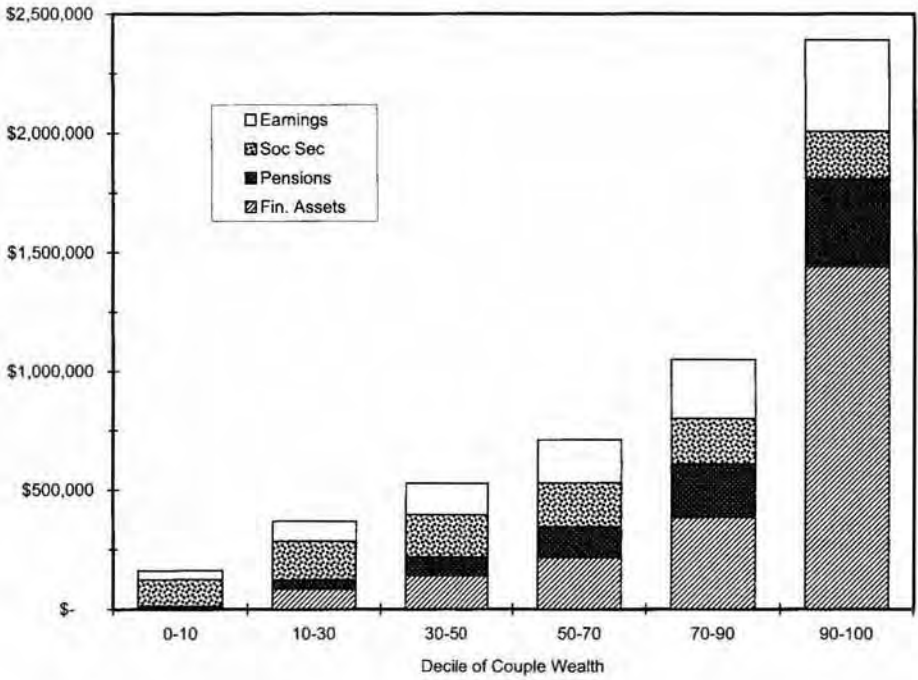


Figure 1. Sources of HRS couple wealth by decile, dollar value. Source: Authors' calculations using HRS data.

wealth in that it varies positively with the total, but it is quite different in that it is skewed "left" rather than "right." The corresponding percentage distribution appears in Figure 2. At the bottom of the wealth distribution, social security accounts for a very large share of total wealth, about 60 percent for the lowest decile, but its share declines to 7 percent among the top ten percent of the wealth distribution. Conversely, the share of conventional assets rises steadily through the middle of the wealth distribution, with social security's share declining in favor of private pensions and future earnings.

An important dimension to consider is age, shown in Figure 3. The value of future earnings declines with age as couples near retirement while the value of social security benefits rises, mainly because discounting matters less as one approaches the age of eligibility. Pensions change relatively little across age in this sample. We do not investigate this issue further here, but it appears that this is the result of two offsetting trends: a life-cycle increase in pension wealth by age and a trend toward greater use of private pensions among younger cohorts. Conventional assets also change rather little with the age of the wife.

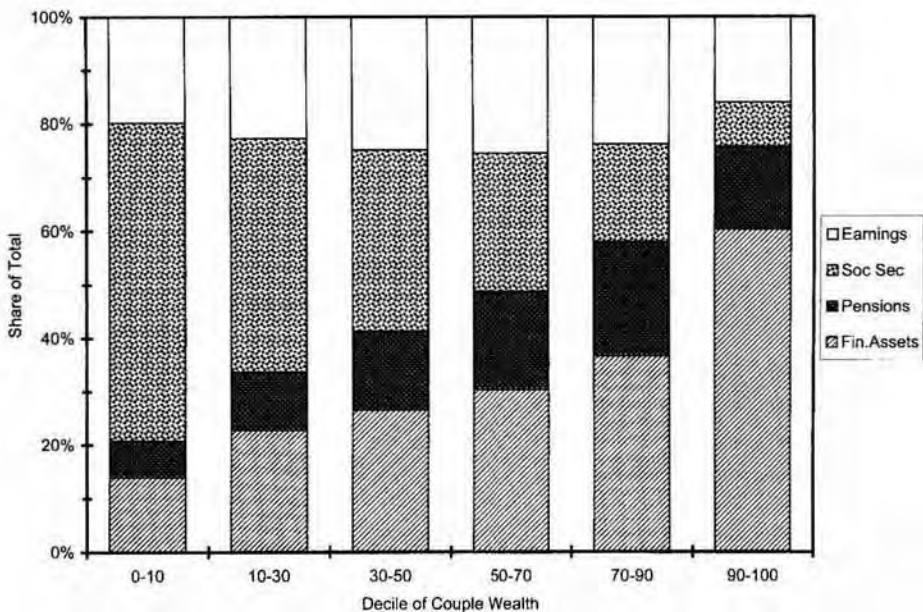


Figure 2. Sources of HRS couple wealth by decile, share of total. Source: Authors' calculations using HRS data.

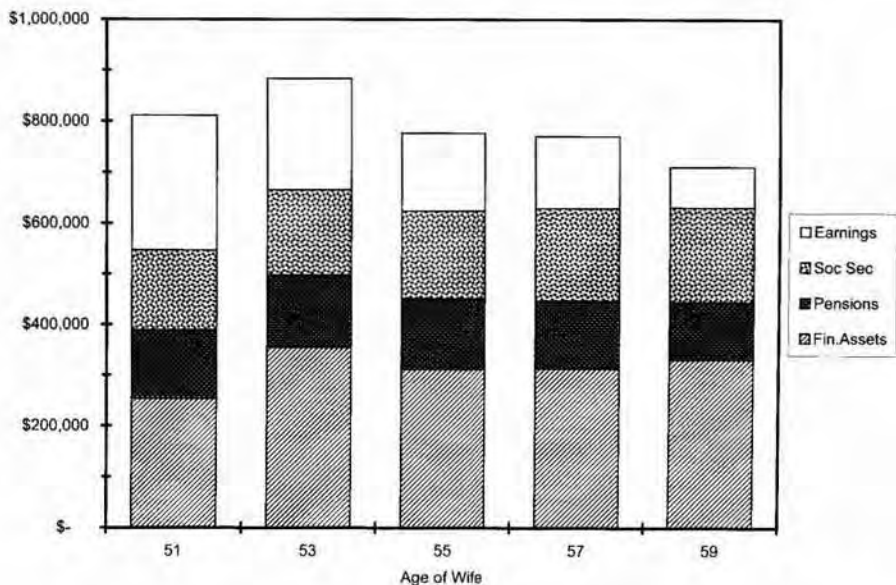


Figure 3. Sources of HRS couple wealth by age of wife. Source: Authors' calculations using HRS data.

### The Wealth of Prospective Widows

We now examine what wealth would be available to these HRS women if their husbands had died suddenly around the time of the wave 1 interview. We estimate that such a prospective widow would have about \$620,000 on average, with a median of \$439,000. This implies that about 79 percent of couple wealth is heritable by prospective widows. On the other hand, the dispersion of widow wealth is greater than for couple wealth: the wealthiest decile of widows would have 35 percent of the wealth (compared to 30 percent for couple wealth) and the Gini coefficient of prospective widow wealth would be 0.44 (compared to 0.38 for couples).

If, instead, the wives died, the surviving husbands of these HRS women would have average wealth of \$659,000, with a median of \$473,000. Thus, they would be about 6 percent wealthier in widowhood than their wives on average, a meaningful but not a large difference. Widower wealth would be only slightly less unequally distributed than widow wealth: the share of the top 10 percent is 34 percent and the Gini coefficient is 0.43.

The composition of wealth for prospective widows differs from the composition of couple wealth because of the differential life-contingencies or inheritance rules governing the various assets. We assume that conventional assets are fully heritable, so these take on greater importance for widows, constituting 50 percent of total wealth on average, compared with 39 percent for couples. Social security benefits are slightly less important for widows than for couples at 16 percent, private pensions at 14 percent, and life insurance policies on the husband account for 11 percent of widows' wealth. Future earnings account for nine percent of widows' wealth (assuming widowed women do not take a job on becoming widowed).

Wealth composition also varies with the level of wealth, as shown in Figures 4 and 5. Looking at the absolute levels, conventional assets are even more concentrated among the most wealthy widows than in the couple distributions. Social security wealth is again relatively equally distributed across the wealth classes, but here too it increases with total wealth up to the middle of the distribution and never declines. Both pensions (partly inherited) and future earnings (of the widow only) increase steadily with total wealth. Even more surprisingly, so does the value of life insurance policies, which rises to an average level of over \$200,000 for the richest decile of widows. This pattern, in which life insurance seems to reinforce rather than reduce the inequality of widow outcomes, is discussed at greater length elsewhere (Weir and Willis 1996).

The evidence on shares of wealth reinforces these impressions. Social security accounts for 68 percent of the wealth of the poorest prospective widows, and only 5 percent of the richest. Life insurance, future earnings, and pension income all show a gentle U-shaped pattern, rising in impor-

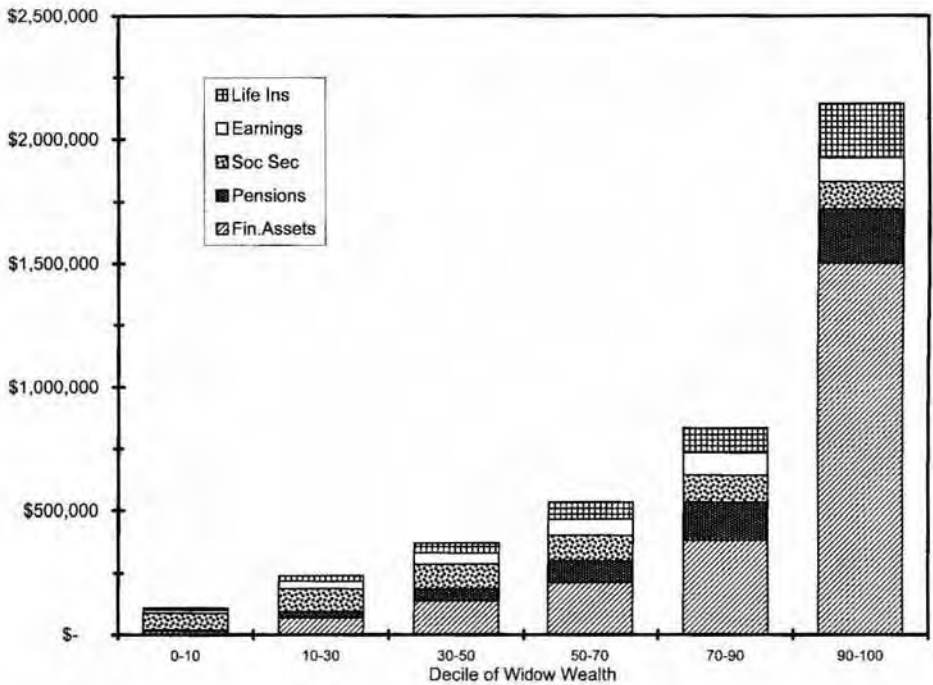


Figure 4. Sources of HRS prospective widow wealth by decile, dollar value. Source: Authors' calculations using HRS data.

tance into the middle of the distribution and falling off in the top wealth deciles. Conventional assets increase in importance.

Patterns of prospective widow wealth by age of the wife are shown in Figure 6. These patterns are similar to those for couple wealth (Figure 3). Life insurance and future earnings are more important at younger ages and decline steadily. Private pensions are relatively stable, while conventional assets and social security increase in importance with age.

The ratio of the prospective widow's to the couple's wealth, which we call the "inheritance rate," is shown in Figure 7 by source of wealth. The top panel depicts rates according to the couple's place in the distribution of couple wealth, and the rates prove to be fairly stable. By assumption, conventional assets are inherited at 100 percent so we do not show a curve for them. Nevertheless, their influence is clearly visible in the upward trend of the overall inheritance rate for total wealth (life insurance is included in the widow's wealth total, but since its share of total widow's wealth is fairly stable at around 9–12 percent it does not distort the pattern by wealth). Other

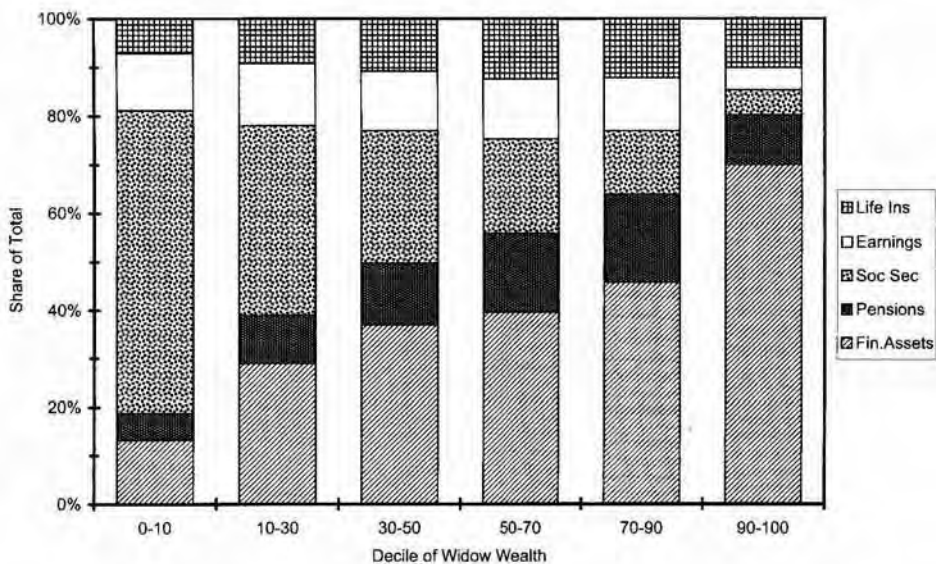


Figure 5. Sources of HRS prospective widow wealth by decile, share of total. Source: Authors' calculations using HRS data.

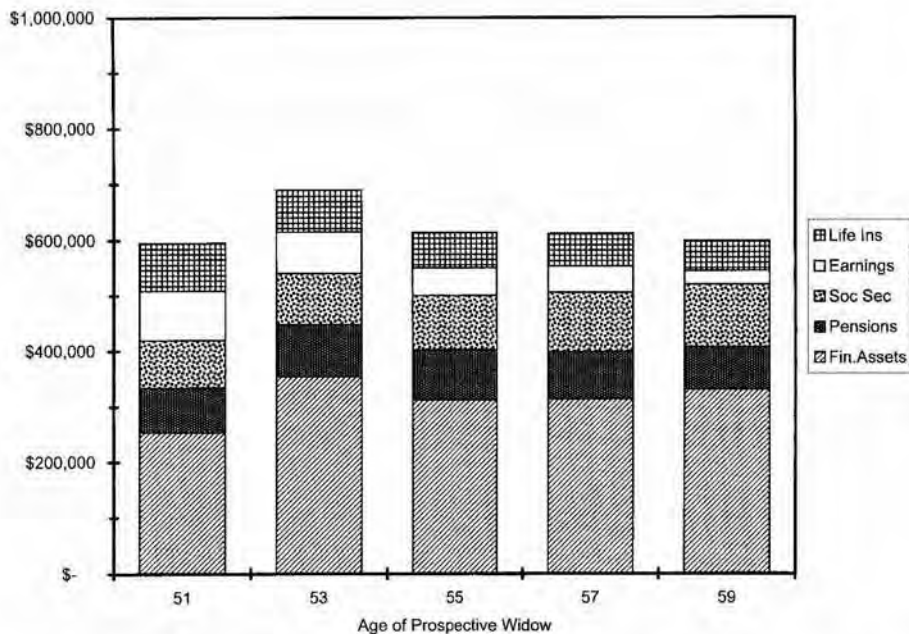


Figure 6. Sources of HRS prospective widow wealth by age of prospective widow, dollar value. Source: Authors' calculations using HRS data.

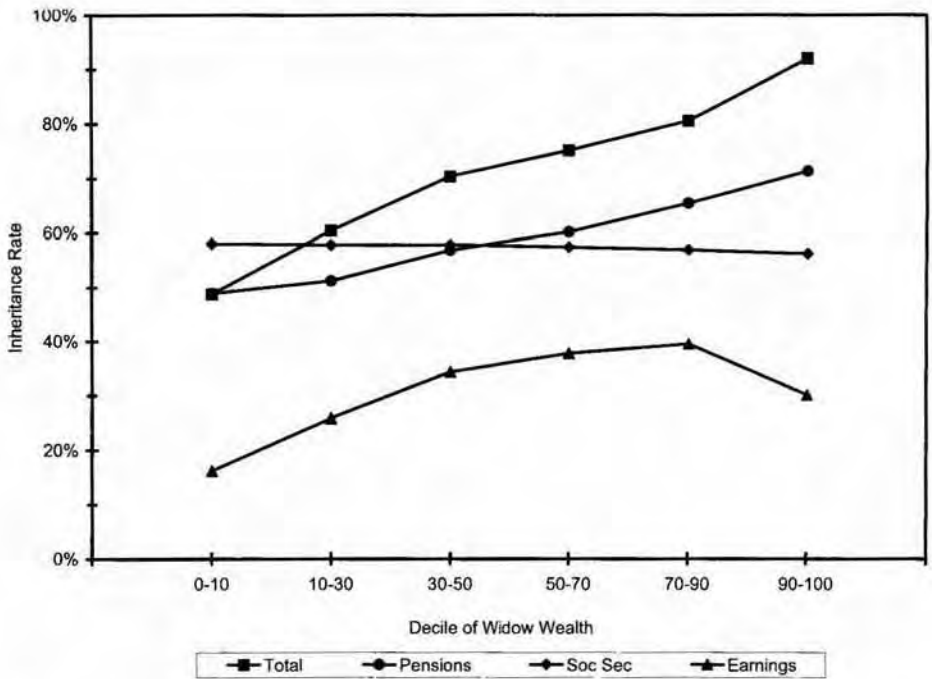
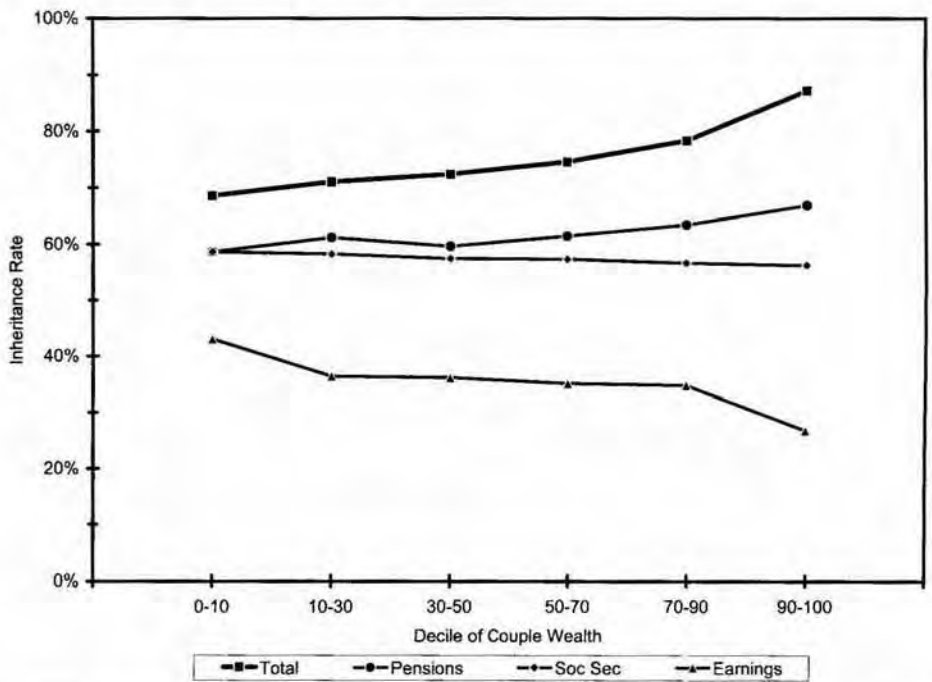


Figure 7. HRS prospective widow inheritance rates by source and decile: couple wealth (top) and widow wealth (bottom). Source: Authors' calculations using HRS data.



types of wealth are less than perfectly heritable: social security declines very slightly with total wealth; the inherited share of pensions rises with couple wealth, which means that the wife's own pensions and the husband's defined contribution pensions are an increasing share of the total; and wives contribute a slightly greater share of household earnings in the poorest households and a smaller share in the wealthiest.

The lower panel organizes the information according to the prospective widow's place in the (hypothetical) distribution of widow's wealth. Here differential inheritance rates across couples are more visible, showing that widow poverty is not simply the sequel to couple poverty. In the bottom decile of couple wealth, the average inheritance rate for all wealth was about 70 percent. In the bottom decile of widow outcomes, the average inheritance rate is only 50 percent. Social security's benefit rules ensure that inheritance rates do not vary much. Private pensions show a more sharply increasing pattern of inheritance rate by wealth. Earnings vary even more, especially at the bottom of the distribution. The poorest widows have earnings that are less than 20 percent of couple earnings.

### Sustainable Consumption Paths

We next convert the wealth stock measures into estimates of sustainable individual consumption levels. Following Auerbach and Kotlikoff (1987), we do this by calculating the individual single-life annuities that could be purchased at actuarially fair rates.<sup>5</sup> Using the Social Security Administration's forecast life tables by age, sex, and birth cohort, we calculate for each HRS respondent an annuity rate that converts his or her stock of wealth into an annual single-life annuity payment. The inverse of the annuity rate is what used to be known as years' purchase—the multiple of the annuity payment needed to purchase it. It is simply the price (capital sum required) of a one-dollar annuity for life. For a single individual the sustainable consumption level is the present value of wealth  $PVR$  divided by the price of a single-life annuity  $D$ . Thus:

$$\text{Widow:} \quad A_f = \frac{PVR_f}{D_f} ,$$

$$\text{Widower:} \quad A_m = \frac{PVR_m}{D_m} .$$

Couples are slightly more complicated. To provide equal consumption annuities to both spouses, the present value of a couple's resources is divided by the sum of their individual annuity prices. But the sustainable consumption of a couple is not based on full couple wealth. As noted earlier, life insurance has no effect on full couple wealth (when it is actuarially fair

term insurance). That makes it appear as if buying life insurance for surviving spouses is costless in terms of the consumption of the couple while married, when in fact it is precisely the reduction in potential married consumption that is the price paid for higher prospective widow consumption. The problem is to decide by how much to reduce the couple's available wealth for consumption (or their consumption annuities) for the purchase of life insurance. The correct amount of wealth reduction is the discounted value of all future life insurance premiums. To know this we would need to solve a dynamic program solving for optimal insurance purchases in each future year depending on the position of all other financial resources in each future year. A simpler approach uses an approximation. Optimal life insurance amounts can be expected to fall with age because the share of life-contingent assets (notably earnings) declines. If the couple maintained constant premiums at their current levels, they could buy slowly declining amounts of (term) coverage which we expect would exceed their needs as they enter retirement. We therefore deduct the annual premium reported at HRS wave 1 from the couple's combined consumption annuity.

From this point, we could follow Auerbach and Kotlikoff in comparing the potential annuities of women as wives, to the potential annuities they would be able to buy if they became widowed. The ratio of the two consumption annuities (widow/wife) is an index of adequacy of provision for widowhood. Before we do so, however, we need to consider what levels of consumption are needed in each state to produce the same standard of living. This requires a discussion of equivalence scales.

### Equivalence Scales

Equivalence scales refers to the consumption needs of households of different compositions expressed relative to some "standard" household type. Developing these scales has represented a long-term challenge to economists and policy-makers alike. One debate concerns economies of scale in consumption as household size increases. That is, in comparing couples to surviving spouses, we collapse all aspects of gains to marriage into a greater efficiency of consumption. If there were no scale economies, then two people need would twice as much income as a single person. If "two can live as cheaply as one," then the income needed to support a widow at the same standard of living would be identical to the couple's income. The truth lies somewhere in between, but the range is enormous.

Equivalence scales estimated in or implied by previous work appear in Table 4, recognizing that an equivalence scale can be expressed in different ways. The first column of Table 4, following the most common format, shows how much consumption (or income or expenditure) is needed by a couple compared to a single person. The second column is simply the inverse: it shows how a single person's needs compare to those of a couple. The

TABLE 4: Consumption Ratios Implied by Different Equivalence Scales for the Elderly

<i>Equivalence Scale</i>	<i>Consumption Ratios</i>		
	<i>Two/One</i>	<i>One/Two</i>	<i>Widow/Wife</i>
Social Security 2-earner couple	2.00	0.50	1.00
German poverty threshold	1.81	0.55	1.10
Danziger et al. (couple/widow)	1.73	0.58	1.16
Citro-Michael	1.62	0.62	1.23
Social security 1-earner couple	1.50	0.67	1.33
Merz (US)	1.49	0.67	1.34
Danziger et al. (couple/widower)	1.36	0.73	1.47
U.S. Poverty threshold	1.26	0.79	1.59

*Source:* Authors' calculations from data reported in Danziger et al. (1984), Table 3; Citro and Michael (1995), pp. 165-82; and Burkhauser, Smeeding, and Merz (1996), Table 1.

*Note:* The indicated consumption ratios (Two/One) are ratios of the amounts of consumption expenditure needed to provide the same standard of living (or utility) for an elderly couple as compared with a single individual over 65, according to the equivalence scales estimated by the indicated author or embodied in the indicated policy rule.

third column expresses equivalence scales in terms of the ratios we will use to compare our results with Auerbach and Kotlikoff's (1987) estimates: namely, the ratio of a widow's consumption needs to that of a wife for the same standard of living. This is simply the second column times two, based on the assumption that a wife consumes one-half of the couple's total. Another equivalence is the U.S. government's poverty threshold, which assumes that a widow needs 79 percent of the income available to a married couple to achieve the same standard of living. Assuming that she had half the couple's consumption while married, her needs as a widow are 59 percent greater than they were as a wife. The German government's poverty threshold assumes much smaller scale economies, where the widow is assumed to need only 55 percent of a couple's consumption, or about a 10 percent increase over her consumption while married. Citro and Michael (1995) surveyed the literature of poverty studies to distill a "back-of-the-envelope" equivalence scale formula of  $n^{-7}$ , where  $n$  is the number of persons in the household.

Other analysts have estimated equivalence scales allowing for differences by sex. Danziger et al. (1984) find that men's needs are much greater than women's when living alone, although both estimates detected lower scale economies than the official poverty threshold. Unfortunately, the estimated sex differences do not distinguish the elderly from younger age groups, and so are almost certainly too large.

The Social Security Administration also has an implicit equivalence scale, in that the nonworking spouse's benefit is equal to one-half of the earner's

benefit, making the couple's income 1.5 times the earner's benefit. At the death of either spouse, the survivor receives the earner's benefit. This leaves a widow with two-thirds of the couple's social security income. However, working women are treated differently. At widowhood the widow receives the larger of her own or her spouse's benefit, and often this will be the husband's benefit. Thus the working widow is left in the same absolute position as if she had not worked, and in a worse position relative to her consumption in marriage. In the limit, if their individual benefits were equal, the surviving spouse receives only half the couple's social security benefits.

### Widowhood and Consumption Ratios

The ratio of potential widows' to wives' consumption levels among HRS women varies substantially across respondents to the 1992 study. Table 5 shows the cumulative fraction of women whose consumption possibilities as widows would fall at or below a given threshold, as compared to their consumption as wives. The table also presents figures from 1962, derived from Auerbach and Kotlikoff (1987).

We present these for couples in three initial wealth groups. Couples with the lowest wealth are the ones we believe most relevant to the issue of widow poverty. According to the official poverty equivalence scales described in the previous section, a consumption ratio of 1.6 would be needed to keep a widow above the poverty line if the couple was just at the poverty line when the husband was alive. Relatively few women in low-income households would see even a 50 percent increase as widows (82 percent in 1969 and 79 percent in 1992).

We also see an improvement in widows' consumption levels over time. This is apparent at the more reasonable level of 1.25, corresponding to economic estimates of equivalence scales. Almost three-quarters of prospective widows in low-wealth families failed to reach this level in 1969, compared with only 55 percent in 1992. At consumption ratios of 1.0 or below, the differences are even sharper. Less than one-quarter of women in 1992 faced an absolute decline in their sustainable consumption, compared with 58 percent in 1969. These gains were even greater among the wealthier couples. The 1.25 consumption threshold was not reached by 75 percent of middle-class and 60 percent of the top group in 1969, whereas only 39 percent and 20 percent failed to reach it in 1992. Taking all wealth categories together, the potential widow's median consumption ratio rose from 1.02 to 1.36 over the two decades, while that for men rose much less, from 1.73 to 1.83. Clearly provision for widows has improved substantially more than for widowers.

One explanation for the observed changes over time arises from an examination of the composition of couple wealth. Even after adjusting for infla-

TABLE 5: Wives Whose Potential Consumption in Widowhood Would Fall Below a Given Ratio of Their Consumption in Marriage, by Wealth of Couple and Year

<i>Cumulative Fraction with Consumption Ratio Below:</i>	<i>Present Value of Couple's Resources</i>					
	<i>Low</i>		<i>Middle</i>		<i>High</i>	
	<i>1969</i>	<i>1992</i>	<i>1969</i>	<i>1992</i>	<i>1969</i>	<i>1992</i>
0.50	0.12	0.03	0.08	0.01	0.04	0.00
0.75	0.34	0.07	0.27	0.04	0.17	0.01
1.00	0.58	0.24	0.52	0.14	0.37	0.06
1.25	0.73	0.55	0.75	0.39	0.60	0.20
1.50	0.82	0.79	0.90	0.75	0.77	0.52
1.75	0.88	0.89	0.96	0.91	0.90	0.85

*Source:* Authors' calculations from HRS data for 1992 and from Auerbach and Kotlikoff (1987) Table 4, based on the Retirement History Survey for 1969.

*Note:* The consumption ratio is the ratio of the sustainable consumption that would be available to a woman if widowed to the sustainable consumption available to her while married. Both samples have been stratified by current couple wealth: under the 20th percentile (low), 20th to 60th (middle), and high. Each column displays the cumulative distribution of consumption ratios for a particular group.

tion (using the CPI), older couples experienced substantial real growth in all forms of wealth, with average total wealth rising from \$416,000 in 1969 to \$788,000 in 1992 (\$1992). Of course, what matters for the relative status of widows is the life-contingent structure of that wealth, and here we find that private pensions have increased substantially. Men's pensions accounted for eight percent of couple wealth in 1969 but women's pensions were worth essentially zero. Auerbach and Kotlikoff (1987) assumed that men's pensions were strictly single-life annuities and not heritable. While spousal rights to pensions were improved over time through several regulatory changes, the increase in pensions is also key. Men's pensions were 12 percent of couple wealth in 1992 and women's pensions nearly 5 percent, which means that widows would retain nearly 11 percent of couple wealth in 1992 that they had none of in 1969. Some of the time series change is also due to growing conventional wealth, which rose from 37 percent of total couple wealth in 1969, to 39 percent in 1992.<sup>6</sup> Women's earnings have also increased relative to men's, so the loss of a husband's income will now have less impact on the prospective widow's wealth.

To what extent has life insurance enhanced women's protection against economic losses in widowhood? The answer appears to be "not much." Men's future earnings did become more completely insured over time (from 43 to 59 percent). Their future earnings also fell as a share of couple wealth (from 20 to 15 percent). The net result is that life insurance stayed at about nine percent of the value of couple wealth.

### Prospective Poverty Rates

We are also interested in the absolute levels of resources available to wives and widows, especially at the low end of the wellbeing scale. The distribution of sustainable consumption levels of prospective widows and widowers relative to the official poverty thresholds for 1992 appears in Table 6. We find, for example, that 6 percent of the age-eligible married women in the HRS would, if widowed, have sustainable consumption levels below the official poverty threshold for single persons, and two-thirds of them (4 percent of the total) would be below 60 percent of the couple poverty line (corresponding to the Danziger or Citro-Michael equivalence scale). By contrast, only 3 percent of their husbands would be below the poverty line if widowed, and only 4 percent of the age-eligible married men in the HRS.

We must emphasize that these estimates are likely to underpredict future poverty rates for several reasons. Official poverty rates are based on a particular and restrictive definition of annual income received, whereas our estimates of sustainable consumption levels are derived from estimates of lifetime wealth whenever it was or will be earned. For example, the poverty measure does not include as income the annual rental value of home ownership. Table 6 gives some indication of this effect by reporting the distribution of sustainable consumption when the value of home equity is excluded from the definition of wealth. The inclusion of housing wealth moves many people up a category in the middle of the distribution (where housing equity is quantitatively important), but has less impact at the bottom near the official poverty threshold (where housing wealth is small). Almost nine percent of women would be below the poverty line if their housing wealth was excluded from their available consumption as widows.

We also examine how excluding other components of wealth (one at a time) affects sustainable consumption. These are calculations simply intended to give an idea of the relative importance of the different resources available to people at risk of poverty, and they do not assume behavioral responses to changes in policies or programs. Social security is the most important of the four wealth components considered here. Without social security, the simulation indicates that there would be nearly three times as many widows in poverty (17 percent). Its proportional effects on men's prospective poverty rates are about the same as for women. But since men's poverty rates are lower, social security substantially reduces the differences in poverty rates between widows and widowers.

Earlier we assumed that a spouse's defined benefit pension could be inherited at 50 percent. This proves not to be very important, and if pensions were eliminated entirely it would have little effect on poverty rates. That is because pensions only amount to about five percent of the wealth of couples at the bottom of the wealth distribution. Consequently, policies to

TABLE 6: Prospective HRS Widow(er)s Who Would Have Sustainable Consumption Levels Below the Indicated Thresholds, by Wealth Definition

<i>Cumulative Fraction with Consumption Threshold Below:</i>	<i>Excluding from Widow(er) Wealth</i>				
	<i>Nothing</i>	<i>Housing</i>	<i>Spouse DB Pensions</i>	<i>Social Security</i>	<i>Life Insurance</i>
<i>Age-eligible women</i>					
.6*PL(2)	0.041	0.052	0.046	0.125	0.049
PL(1)	0.062	0.086	0.072	0.171	0.078
1.5*PL(1)	0.131	0.204	0.157	0.284	0.167
2*PL(1)	0.229	0.323	0.265	0.386	0.285
4*PL(1)	0.585	0.672	0.631	0.684	0.657
<i>Their husbands</i>					
.6*PL(2)	0.020	0.030	0.021	0.073	0.022
PL(1)	0.032	0.046	0.032	0.103	0.037
1.5*PL(1)	0.070	0.104	0.074	0.170	0.076
2*PL(1)	0.118	0.183	0.124	0.246	0.137
4*PL(1)	0.415	0.526	0.427	0.554	0.445
<i>Age-eligible men</i>					
.6*PL(2)	0.030	0.042	0.030	0.076	0.032
PL(1)	0.044	0.058	0.045	0.099	0.049
1.5*PL(1)	0.084	0.114	0.087	0.159	0.092
2*PL(1)	0.133	0.182	0.139	0.233	0.151
4*PL(1)	0.405	0.489	0.413	0.511	0.431

Source: Authors' calculations using HRS data.

Notes: PL(1) is the poverty line for a single person (\$7,299 in 1992) PL(2) is the poverty line for a couple (\$9,443 in 1992). N=3362 age-eligible married women in the HRS Wave 1, and the same number of husbands. Frequencies are weighted using the wife's person-level weight (inverse of sampling probability). N=3577 age-eligible married men, with frequencies weighted using man's person-level weight. Each column within a panel displays the cumulative distribution of consumption levels for a particular definition of wealth available to support consumption. See also Table 2.

increase the heritability of pensions might affect the well-being of the middle class, but they would not do much to alleviate poverty.

Life insurance reduces the prospective widow poverty rate from eight percent to six percent. It is therefore not entirely absent from the financial plans of even the poorest couples. As yet we cannot say how much more it might do, until we examine whether consumption could have been transferred from the married state to the prospective widow state.

The distribution of widow(er) consumption levels for different initial couple consumption levels appears in Table 7. We find that poor couples rarely produced potential widows that escaped poverty. Husbands fared little better, so it is unlikely that such persons could have purchased life insurance. Also troubling is the fate of couples within 150 percent of the poverty

TABLE 7: Prospective HRS Widow(er)s Who Would Have Sustainable Consumption Levels Below the Indicated Thresholds, by Position of Couple

Cumulative Fraction with Widow(er)'s Consumption Threshold Below:	Couple's Sustainable Consumption Relative to Poverty Threshold					
	<PL(2)	PL(2)	1.5*PL(2)	2*PL(2)	>4*PL(2)	All
<i>Age-eligible women</i>						
.6*PL(2)	0.814	0.338	0.048	0.006	0.000	0.041
PL(1)	0.914	0.599	0.138	0.013	0.001	0.062
1.5*PL(1)	0.968	0.921	0.579	0.084	0.002	0.131
2*PL(1)	0.987	0.968	0.849	0.282	0.007	0.229
4*PL(1)	1.000	1.000	0.993	0.940	0.192	0.585
<i>Their husbands</i>						
.6*PL(2)	0.589	0.071	0.009	0.000	0.000	0.020
PL(1)	0.857	0.147	0.024	0.000	0.000	0.032
1.5*PL(1)	0.972	0.761	0.151	0.012	0.000	0.070
2*PL(1)	1.000	0.949	0.579	0.050	0.000	0.118
4*PL(1)	1.000	0.996	1.000	0.699	0.033	0.415
Weighted number of couples	98	122	206	1308	1628	3362

Source: Authors' calculations using HRS data.

Notes: PL(1) is the poverty line for a single person (\$7,299 in 1992) PL(2) is the poverty line for a couple (\$9,443 in 1992). Frequencies are weighted using the wife's person-level weight (inverse of sampling probability). The couple's sustainable annual consumption level is reduced by the (actuarially fair) premia they would need to pay per year for the current amount of life insurance in force. Each column within a panel displays the cumulative distribution of consumption levels for a particular definition of wealth available to support consumption. See also Table 2.

line. Sixty percent of the wives in that group would fall below the single-person poverty threshold if widowed, as compared with only 15 percent of their husbands. This is evidence of vulnerability to poverty differing by sex.

### Characteristics of the Vulnerable

To explore in greater detail who is at risk of poverty or substantial economic loss at widowhood, we offer an overview description of how at-risk women differ from those not at risk. As we have already seen, the poorest prospective widows are much more likely to come from poor families in which the husband also faces poverty in widowhood. This effect is reinforced in Table 8 by the direct relationship between level of wealth and its life-contingent structure. The Auerbach-Kotlikoff widow/wife annuity ratios are lowest for poor widows and rise with widow's well-being. Thus, in addition to being poor, poor households transfer smaller proportions of their wealth to a widow. A



TABLE 8: Characteristics of HRS Marriages by Prospective Widow's Consumption

	<i>Widow's Sustainable Consumption Relative to Poverty Threshold</i>					
	<i>&lt;.6*PL(2)</i>	<i>.6*PL(2)</i> <i>-PL(1)</i>	<i>PL(1)</i> <i>-1.5*PL(1)</i>	<i>1.5*PL(1)</i> <i>-2*PL*(1)</i>	<i>2*PL(1)</i> <i>-4*PL(1)</i>	<i>&gt;4*PL(1)</i>
Couple poverty rate (%)	57.5	14.0	2.3	0.5	0.1	0.0
Widower poverty rate (%)	54.1	21.3	5.4	1.1	0.1	0.0
No future earnings (%)	83.8	67.8	49.5	46.2	33.4	32.3
White (%)	59.0	63.5	69.1	82.3	88.4	93.1
Health limits work (%)	49.5	39.8	34.4	21.1	18.2	10.2
Education (years)	9.6	10.1	10.5	11.3	12.0	13.6
Age (years)	54.9	55.2	55.3	56.1	56.1	56.3
Avg. past earnings (\$/year)	3197	3215	4692	5502	7724	9881
Wife annuity (\$/year)	4766	7132	9511	11933	16423	38614
Widow annuity (\$/year)	3691	6507	9156	12786	21426	60810
Widower annuity (\$/year)	7784	11367	15735	20891	29353	77411
Widow/Wife annuity (%)	77.4	91.2	96.3	107.2	130.5	157.5
Widow/Widower annuity (%)	47.4	57.2	58.2	61.2	73.0	79.6
N of couples	187	86	282	360	1187	1260
N weighted	138.6	70.4	229.9	331.1	1195.9	1386.1

*Source:* Authors' calculations using HRS data.

*Notes:* PL(1) is the poverty line for a single person (\$7,299 in 1992); PL(2) is the poverty line for a couple (\$9,443 in 1992). Dollar amounts are all in 1992 dollars. All calculations are weighted by the wife's person-level weight (inverse of sampling probability).

major part of this effect is the amount of financial assets, but if that were the only issue it should affect husbands and wives equally. Annuity ratios of widows/widowers suggest that gender inequality is greatest among the poorest prospective widows.

Another important determinant of the life-contingent structure of family wealth is the woman's earnings potential. The great majority of prospectively poor widows have zero projected earnings, while most of the more secure women have positive future earnings. We note that these projections are based on current earnings and respondents' stated intentions for future work; no potential changes that might result from the death of a spouse are incorporated. However, there may be little potential for increased labor supply after widowhood. Nearly half of the HRS wives who would be the poorest widows report that they already have health problems limiting their ability to do paid work, as compared with only 10 percent of wives with the best prospects for widowhood. An education deficit of almost four years separates the poorest from the most comfortable of the prospective widows, which also constrains the potential for future employment. Finally, these women's prior earnings history is consistent with a pessimistic prediction. Based only on women whose records were linked to social security records, the most vulnerable women had average lifetime earnings only about one-third as high as those with the best prospects.

The age differences in Table 8 are surprisingly large: wives projected to be poorest as widows are a full year younger than those with the highest incomes. One explanation for this is that younger women have longer to wait to receive social security benefits which, as we have seen, are the mainstay of retirement wealth for the poorest families. In our calculations, a given level of annual (expected future) social security benefits beginning at age 62 translates into less wealth (present discounted value) for a younger woman, because the benefits are discounted over more years. Younger women may think that widowhood is unlikely before they reach social security age, or that if it did occur they could make it through to social security age on some combination of increased work, family transfers, or government aid. We therefore computed how many women would be above the poverty line once they reached age 62. Table 6 shows that roughly six percent of HRS wives would have insufficient wealth to sustain a lifetime of consumption over the poverty line if they had been widowed around 1992. Of these women, 18 percent were entitled to social security benefits at age 62 that would put them above poverty. An additional nine percent would be above poverty after age 62 if they could preserve their other assets until they reached age 62. Annual social security benefits would be higher if they were claimed at the normal retirement age of 65: roughly 35 percent of the poorest widows would then be above the poverty line from social security alone, and nearly half would be if they did not consume their other assets until then. In addition to underlining once again the importance of social

security in keeping the elderly out of poverty, these estimates point to the importance of choices made in the years immediately before social security eligibility in determining economic status after retirement.

Avoiding premature consumption of retirement assets is even more important for women not at risk of poverty. Among the 94 percent of wives not initially at risk for poverty in widowhood, fully 28 percent are entitled to age 62 social security benefits that are below poverty level; at 65, 16 percent are below this level. Private resources are therefore critically important in preventing poverty, and unexpected losses of future earnings or assets between now and retirement put many additional women at risk.

## Conclusion

Our goal has been to direct attention to a relatively neglected but critically important aspect of married couples' financial resources: namely, the life-contingent structure of assets. Based on the rules governing transmission of different components of family wealth, we assess how much wealth would likely be available from current marriages to widows or widowers. This prospective analysis of the finances of currently married couples focuses attention on current decisions that influence what will happen after the spouse's death.

Our results using the 1992 HRS may be compared with the older analysis by Auerbach and Kotlikoff (1987). We find that wives today, if widowed, would retain a substantially greater share of their marital consumption as compared to 20 years ago. Men also do somewhat better, but the gender gap has narrowed considerably. It appears that much of the change is due to private pension wealth and its heritability, along with the rise in women's earnings and financial assets. Another explanation is that life insurance coverage of husbands' earnings increased at the same time husbands' earnings fell, resulting in less uninsured loss of husbands' income.

While a couple's overall wealth level is key in reducing the risk of widows' poverty, it is not the only factor. In particular, the composition of couples' wealth matters, too. Women with low earnings and low labor force participation are the most vulnerable. In addition, having low earnings is strongly correlated with characteristics such as poor health and low education, so poor women are also least likely to be able to respond to widowhood by increasing their future earnings.

Our results cast some doubt on the potential to solve the problem of poverty by reforming pensions or social security alone. Enhancing the heritability of assets between spouses could be justified for the middle class, on the grounds that men's potential consumption as widowers is on average substantially greater than that available to their widows. This reform would not have much effect on poverty rates, however, because of the small amounts of pension wealth available for inheritance in poor couples. Similar limitations

apply to a plan to increase social security survivor benefits: its effect would be greatest on families well-removed from the risk of poverty. More redistribution could be imposed within social security: survivor benefit replacement rates are now the same for everyone (100 percent), but they could be made a function of income. There are good arguments against introducing means-testing into social security, however, leaving the current system of Supplemental Security Income as the most efficient means to target assistance to the needy elderly (see Manchester, forthcoming; Newmark and Powers, forthcoming).

Observed patterns of life insurance purchase by couples nearing retirement pose a puzzle for the life-cycle model of insurance demand and for policies built on its predictions. Life insurance in principle offers a tool to smooth consumption across the future states of the world. In practice, it appears instead to exaggerate consumption differences. This is because life insurance is purchased most heavily by the wealthy and healthy (Weir and Willis 1996). A potential explanation for this might be that life insurers price-discriminate against those who seek to purchase small quantities of insurance. Term life insurance prices per dollar of coverage decline as the quantity purchased increases, and this pattern is only partly explained by fixed administrative costs per policy (Cawley and Philipson 1996). Because low-income workers lacking employment-based access to group rates are at most risk to leave a widow in poverty, insurance access and pricing should receive more attention in future work.

Future research should also delve further into the consumption patterns of the elderly. If the official poverty index overstates economies of scale among couples, and thereby overstates the needs of unmarried individuals, then evidence on poverty among elderly widows may be seriously exaggerated. Conversely, if elderly couples enjoy important economies of scale, a redesign of social security benefits and other policy reforms may be needed to better insure against the loss of those scale economies with the loss of a spouse. Future research should also explore whether and how couples nearing retirement think about the life-contingent structure of their asset claims, or of the tradeoffs they face among differently structured annuities.

Finally, our analysis thus far relies on analysis of the baseline HRS interview, which is but a single cross-section. In future research we will reexamine HRS respondents in the longitudinal file, to compare actual outcomes of loss of spouse with our predictions. This will help us say, with much greater certainty, whether the apparent improvement in married couples' financial provision for widowhood over the last 20 years will further reduce poverty among elderly widows over the next 20 years.

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## Notes

1. Current-status poverty rates may reflect selection effects: if poorer couples are more likely to be widowed and/or if poor widows are less likely to remarry, this will increase the observed gap between widows and the still married. There is some evidence that the loss of a spouse is often a precipitating event in the transition to poverty, however. Hurd (1990: 583–84), using the Retirement History Study (RHS), reports that 37 percent of women who were widowed from a nonpoor marriage in 1975 were below the poverty line as widows in 1977, compared with only 4 percent of women whose husbands survived. Becoming widowed also reduced the chances of leaving poverty over that interval from 50 percent for couples to 15 percent for widows. Research using the Panel Study of Income Dynamics also found that the income-to-needs ratio declined after retirement at about the same rate for couples and for men who lost their wives, but it fell more quickly for widows (Burkhauser and Duncan 1991). The death of a spouse is clearly a more economically harmful event for women than for men (Burkhauser, Butler, and Holden 1991).

2. A detailed data Appendix is available from the authors on request.

3. The actual inheritance patterns of widows may vary. For instance, a couple may choose to give bequests to other heirs rather than the widow, and some debts may be avoided after the spouse dies.

4. Mortality is known to vary by income and ethnicity, and this can have important effects on the present value of similar future income streams (Panis and Lillard 1996). Individual survival probabilities may also depend on the survival of the spouse, with death rates increasing after loss of a spouse (Lillard and Panis 1996). The HRS also contains substantial amounts of health information on individuals, including questions about individuals' own survival expectations. In related work we are examining the effects of differential survival probabilities (Weir and Willis 1996), but much remains to be done. Note, however, that the effect of such mortality differentials is substantially reduced by our subsequent transformation of wealth into sustainable consumption levels.

5. This approach implicitly sets loads to zero.

6. Some of this increase may reflect improved wealth assessment in the HRS compared with the RHS data set used in the earlier analysis.

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