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THE ADEQUACY OF LIFE INSURANCE

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In this paper, we use an economic approach to determine house-holds' life insurance needs. In the economic approach, life insur-ance needs and spending targets are simultaneously determined by smoothing households' living standards over their life cycles and ensuring comparable living standards for potential survivors. We demonstrate that life insurance recommendations provided by the economic approach are considerably different from those provided by the conventional approach. When comparing recom-mended with actual life insurance holdings, we find that under-insurance is widespread among secondary earners in married couples. We also identify a systematic gender bias: for any given level of financial vulnerability, couples provide significantly more protection for wives than for husbands.

The views expressed in this paper, including any discussion of financial planning methodol-ogy or software products, are those of the authors and not necessarily those of TIAA-CREF.

>>> **INTRODUCTION**

Life insurance is easy to purchase. It is relatively cheap. And it is vital to most survivors. Hence, economic theory delivers one and only one prescription about life insurance – "buy it, if you need it." But knowing whether you need life insurance is not easy. And knowing that you need to buy life insurance and actually doing so are two different things.

The truth is that no one likes to think about dying. No one likes to talk about dying. No one likes to pay premiums for an event, in this case dying early, that may never occur. And no one likes to spend time with life insurance agents. "Economic man" thus meets "psychological man" head on when it comes to life insurance decisions. The chance to pit economics against psychology is just one reason economists have been studying the determinants and adequacy of life insurance holdings for close to two decades. The other is the significant policy implications of potentially finding that insurance holdings are inadequate for a major segment of the population.

The research on insurance adequacy produces a single clear and consistent message: *When it comes to buying life insurance, economic man is making major mistakes.* While many households are buying reasonable amounts of life insurance, others are buying far too little, and others are buying too much.

In this paper, we use an economic approach to determine households' life insurance needs. Unlike the conventional approach that asks households to specify their spending and insurance targets, the economic approach determines a household's life insurance needs and spending targets simultaneously by smoothing the household's living standards over its life cycle and ensuring comparable living standards for potential survivors. We show that life insurance recommendations provided by this approach are considerably different from those provided by the conventional approach. We also compare life insurance recommendations provided by our model with actual life insurance holdings and find underinsurance is widespread among secondary earners in married couples.

>>> **THE ECONOMIC APPROACH TO ACCESSING LIFE INSURANCE NEEDS**

Economic theory predicts that households will save and insure in order to enjoy the same living standard over time and in the event of the death of a household head or spouse. This reflects the assumption that there are diminishing returns to bunching all one's spending at a given point in time. Economic theory in this case accords with common sense and every day observation. We save to be able to maintain our life styles in retirement. We buy health, auto, and homeowner insurance to be able to withstand a medical operation, a car wreck, or a house fire without getting burned financially. And we buy life insurance to make sure our survivors can continue to live at the same standard to which they have become accustomed. Life insurance, like other insurance, is used for consumption smoothing – economists' shorthand for trying to maintain a household's living standard no matter what transpires.

Note that consumption smoothing does not dictate spending exactly the same amount in all circumstances. When children are at home and there are more mouths to feed, consumption smoothing means spending more on food, clothing, vacations, etc. in order to keep each household member's living standard unchanged. Similarly, if a household head or spouse/partner passes away, total spending on the surviving household should drop because there is now one fewer person whose living standard needs to be preserved. Hence, life insurance recommendations need to adjust for household composition. They also need to take into account that two can live more cheaply than one (scale economies in household spending) and that children are generally cheaper than adults when it comes to maintaining a given living standard.

Also note that even when a household's composition is not changing, consumption smoothing does not dictate spending exactly the same amount each year. Special expenditures, like sending the children to college or paying for a wedding, are one-time events that must be paid for when they arise. These expenses are, by their nature, lumpy and come "off-the-top." So too do large housing transaction costs associated with changing homes. Consumption smoothing is also limited by the inability or unwillingness of households

to smooth their living standards if it means going into debt. Economists refer to such households as borrowing constrained. Borrowing constrained households attempt to achieve the smoothest living standard through time that does not violate their borrowing constraints.

In calculating a household's smoothest living standard through time and, thus, the term life insurance needed each year to protect that living standard, a number of factors need to be taken into account including contingent plans, taxes, and Social Security benefits.[1] Contingent plans refer to how much surviving spouses/partners will earn, the special expenses they will incur, and the special receipts that will come their way. Examples here include a) a non-working spouse who would go back to work were his/her partner to die, b) plans to send children to expensive private school, but only if both spouses are alive, and c) increased gifts received by a surviving spouse from her/his parents.

Determining the full range of future Social Security benefits for which a household will be eligible is also important for generating appropriate life insurance recommendations. Properly calculating current and future taxes is another complicated, yet essential factor. Calculating current and future taxes is a difficult task for several reasons. First, one needs to carefully calculate federal and state income taxes as well as payroll taxes on an annual basis and for all possible survivor configurations of the household. Second, calculating income taxes for future years requires knowing how much income the household will receive from assets in those years, which depends on how much the household saves during earlier years. But how much the household saves depends on how much it spends, which depends on how much it expects to pay in future taxes. Thus future taxes depend on current spending and current spending depends on future taxes, generating what economists call a simultaneity problem. Dealing with this problem requires jointly solving for taxes and spending.

To summarize, developing life insurance recommendations based on consumption smoothing is a very difficult and complicated process, which requires dealing in fine detail with the complexity of tax and Social Security benefit provisions, incorporating contingent plans, and taking into account liquidity constraints. Given the challenge presented by all of these complexities, it is not surprising that traditional financial planning does not typically deal with these issues.

>>> CALCULATING LIFE INSURANCE RECOMMENDATIONS USING AN ECONOMIC APPROACH

In our analysis, life insurance recommendations are calculated using an economic model based on life cycle consumption smoothing. (Our model is implemented using ESPlanner™, a financial planning software.[2]) Rather than ask a household to specify its spending targets, the economic approach finds the targets automatically. The economic approach uses dynamic programming techniques to smooth the household's highest sustainable living standard over its life cycle, taking into account the household's willingness to borrow, household composition, and economies of shared living.

Recommended time-paths of consumption expenditure, taxable saving, and term life insurance holdings are calculated in inflation-adjusted dollars. Consumption in this context is everything the household gets to spend after paying for its "off-the-top" expenditures such as housing transaction costs, emergency spending, life insurance premiums, special bequests, taxes, and net contributions to tax-favored accounts. Life insurance needs at each age by each spouse are calculated to guarantee that potential survivors suffer no decline in their living standards, taking into account the taxes and benefits the surviving spouse would receive each year thereafter. The household is left with zero terminal assets apart from the equity in homes that the household has chosen not to sell.

Before turning to a comparison of life insurance recommendations from our economic approach with those from the conventional approach, a major caveat is in order. While our model deals with a host of critical issues associated with retirement and survivorship planning, it does not deal with all such issues. For example, our model does not explicitly deal with uncertainty in labor earnings, rates of return, health expenditures, disability, and demographics, including

the possibilities of remarriage. Nevertheless, we view recommendations from our model as a very useful benchmark, but not necessarily as delivering the absolute truth, when it comes to saving and insurance recommendations.

>>> RECOMMENDATIONS FROM AN ECONOMIC APPROACH: A CASE STUDY

Base-case Scenario

Consider a married couple named Joe and Sue. Joe is 30, and Sue is 28. Both have a maximum age of life of 95. Joe earns $100,000 a year, and Sue earns $50,000. Both expect to see their real earnings rise by 1 percent per year through retirement, which occurs when they reach age 65. The couple has two children ages 3 and 1. They expect to spend $35,000 per year in today's dollars in sending their children to college for four years each. They have $100,000 in regular assets and own a $300,000 house with a $240,000 thirty-year mortgage. Monthly mortgage payments are $1,500. Annual property taxes are $4,000. Homeowner insurance is $1,000, and annual home maintenance is $2,000. Both spouses are covered by Social Security. Both spouses plan to spend $7,500 for their funeral expenses and leave $50,000 in bequests, where both amounts are measured in today's dollars. Finally, the couple expects to earn a 6 percent nominal return on its saving and expects inflation to equal 3 percent.

Recommended life insurance amounts for Joe and Sue for this base-case scenario are reported in Row 1 of Table 1.

Alternative Scenarios

Table 1 also shows how differences in the couple's circumstances would affect their insurance recommendations. Some of the results may seem surprising until one considers how the change in the case affects the living standard to be protected by insurance or the resources to do so. For example, Row 2's assumption that the couple has $500,000 rather than $100,000 in initial assets. While traditional insurance calculators would generally recommend a $400,000 reduction in Joe's life insurance for Sue's benefits, our model

recommends a much smaller decrease because it recognizes that a) the household will enjoy a higher living standard when both spouses are alive because it has more assets that it can spend and b) if Joe dies, Sue's living standard must be maintained at that higher level.

Row 3 considers a $1 million inheritance that Joe receives in five years, provided he's alive. Notice that Joe's recommended life insurance rises by much less than $1 million. The reason is that the inheritance permits the couple to enjoy a higher living standard, but part of the $1 million is used to pay for Joe's higher living standard. Sue does not need this part to maintain her higher living standard if Joe dies.

The next case entails Joe and Sue having their third child in 2002. While one might expect the addition of a child to raise life insurance needs, there are only modest increases in the insurance recommendations for Joe and Sue. The reason is that having the extra child lowers the living standard of Joe and Sue because of the need to pay for that child's consumption. Hence, if we consider Joe's insurance, he needs more because he has another child to protect, but less because he needs to guarantee Sue a reduced living standard.

Earlier retirement by both Joe and Sue generates a lower level of recommended insurance coverage for Joe, but a higher one for Sue. In Joe's case, he needs to maintain Sue at a lower living standard because the couple's sustainable living standard is lower than it was in the base case. In Sue's case, she needs to provide more protection for Joe because of the fact that a disproportionate fraction of the decline in the couple's earnings are due to the reduction in Joe's lifetime earnings. This process occurs in reverse in Row 7 in which both spouses' earnings grow at a real rate of 2 percent.

The case in which Joe and Sue earn a 6 percent real return, rather than the 3 percent real return assumed in the base case is interesting. Joe's recommended life insurance holdings decline from over $1 million to around $700,000, while Sue's decline from about $38,000 to zero. The explanation is that a higher rate of return make assets a much more powerful tool in providing spending protection to survivors.

The last case considered in the table is one in which

Table 1 Life Insurance Recommendations from an Economic Approach Under Alternative Assumptions		
Scenario	Joe's Recommended Insurance for Sue's Benefits	Sue's Recommended Insurance for Joe's Benefits
(1) Base-case Scenario	$1,056,827	$37,778
Alternative Scenarios:		
(2) $400,000 More in Assets	925,750	0
(3) Joe Inherits $1 Million in 5 Years	1,690,261	0
(4) Joe and Sue Have a Third Baby	1,070,504	66,503
(5) Joe and Sue Retire at 60	948,868	96,956
(6) Joe and Sue Earn a 6% Real Return	706,208	0
(7) Joe's and Sue's Real Earnings Grow at 2%	1,228,376	22,032
(8) Sue Does not Work	1,172,971	0

Sue stops working. While Joe's recommended life insurance holdings rise, they rise by much less than the present value decline in Sue's earnings. Again, the adjustment of the couple's living standard to their reduced lifetime income explains what is going on. On the one hand, Joe needs more insurance because Sue is not working. On the other hand, Joe needs less insurance because the living standard that needs to be protected had declined.

>>> COMPARING LIFE INSURANCE RECOMMENDATIONS FROM THE ECONOMIC AND CONVENTIONAL APPROACHES

Traditional financial planning usually asks households right off the bat how much they want to spend in retirement and how much they want their survivors to spend. It then calculates the amount of life insurance needed to cover those liabilities, based on the targets the household provides. Another common life insurance needs estimation approach applies "a rule of thumb" that uses current income as a proxy for desired future spending. Life insurance recommendations based on this approach are usually equal to a multiple of current income.

Table 2 shows the life insurance recommendations calculated using our economic approach and those calculated using three life insurance calculators on the web. These calculators follow the conventional approach. Specifically, Example A simply applies "a rule of thumb" method that recommends a life insurance amount equal to between 6 and 10 times earnings. Examples B and C apply a needs-based analysis that calculates life insurance needs based on households' current income, expected future expenses, and other factors. Table 2 shows that recommendations from the three calculators vary widely and differ from the recommendations in our base case.

Table 2   Life Insurance Recommendations from the Economic and Conventional Approaches

Approach	Methodology	Joe's Recommended Insurance for Sue's Benefits	Sue's Recommended Insurance for Joe's Benefits
Economic Approach	Life cycle consumption smoothing	$1,056,827	$37,778
Conventional Approach (1) Example A	"A rule of thumb" that recommends life insurance between 6 and 10 times earnings	Between $600,000 and $1,000,000	Between $300,000 and $500,000
(2) Example B	Needs analysis that uses current income as the reference point for setting post-retirement and survivor spending targets	$1,800,000	$1,000,000
(3) Example C	Needs analysis that calculates life insurance needs based on the household's current income and expected future expenditures	$427,500	$427,500

These calculators are just three of the numerous life insurance calculators available on the web that provide recommendations using the conventional approach. The recommendations of these calculators can differ dramatically. For example, Dorfman and Adelman (2002) analyze the Internet life insurance advice and find that there are wide variations in life insurance recommendations offered by 48 web sites. Using life insurance recommendations from our economic model and their needs analysis as two chosen benchmarks, they also find that recommendations from the 48 web sites also differ considerably from the two benchmarks.

Additional research comparing life insurance recommendations from the economic and conventional approaches is presented in Gokhale, Kotlikoff, and Warshawsky (2001). In that study, the authors compare the saving and insurance recommendations from the two approaches for 24 couples, 20 of whom stylized and the other four of whom actual households. The 20 stylized cases all share basic assumptions, but differ with respect to the details of the base household's circumstances and plans. The paper finds that the two approaches recommend dramatically different levels of saving or life insurance in each of the 24 cases.

> > > **COMPARING ACTUAL WITH RECOMMENDED INSURANCE HOLDINGS**

Are households purchasing the reasonable amounts of life insurance? Together with other economists, including Alan Auerbach, Professor of Economics at the University of California at Berkeley, and Professor Douglas Bernheim, at Stanford University, we have studied life insurance holdings in a variety of samples and reached very similar conclusions about life insurance inadequacy.[3] Samples in those studies are drawn from various data sources including the Retirement History Survey, the Health and Retirement Study (HRS), the Survey of Consumer Finances (SCF), a survey of Boston University employees, and a survey

Table 3 Characteristics of Households with Different Levels of Recommended Insurance

PANEL A: INSURANCE LEVELS

Recommended Insurance	Fraction of Households	Percent Insured	Median Benchmark Insurance	Median Actual Insurance	Mean Benchmark Insurance	Mean Actual Insurance	Median Household Earnings	Median Average Age of Spouses (years)
Column 1	*Column 2*	*Column 3*	*Column 4*	*Column 5*	*Column 6*	*Column 7*	*Column 8*	*Column 9*
$0	21.2%	83.1%	$0	$68,000	$0	$215,174	$65,000	56
$1-199,999	28.4	81.2	97,972	39,000	99,073	106,499	35,360	46
$200,000-449,999	25.8	82.8	309,668	100,000	313,821	174,565	50,000	38
$450,000 or more	24.6	83.5	674,480	100,000	1,359,286	346,001	62,220	31

PANEL B: RATIOS OF INSURANCE TO HOUSEHOLD EARNINGS

Ratio of Recommended Insurance to Household Earnings	Fraction of Households	Percent Insured	Median Ratio of Recommended Insurance to Household Earnings	Median Ratio of Actual Insurance to Household Earnings	Mean Ratio of Recommended Insurance to Household Earnings	Mean Ratio of Actual Insurance to Household Earnings	Median Household Earnings	Median Average Age of Spouses (years)
0	21.2%	83.1%	0	0.96	0	2.53	$65,000	56
0 to 3.99	26.8	87.0	2.07	1.37	2.08	2.09	54,000	47
4 to 7.99	24.9	89.9	5.59	1.91	5.69	2.84	54,789	39
8 or more	27.1	71.1	12.57	1.09	15.03	2.86	37,901	30

Source: Bernheim, Carman, Gokhale, and Kotlikoff (2001).

Table 4   Distribution of Potential and Actual Reductions in Living Standards of Surviving Spouses

PANEL A: HUSBANDS AND WIVES

Surviving Spouses are:

Living Standard Reduction	Wives		Husbands	
	Percent With Potential Reduction	Percent With Actual Reduction	Percent With Potential Reduction	Percent With Actual Reduction
40% or more	30.98%	19.26%	3.48%	2.90%
20% to 40%	20.91	18.68	6.49	5.61
0% to 20%	19.36	19.94	17.42	15.10
No Reduction	28.75	5.32	72.60	12.29
0% to -20%	-	31.85	-	63.12
- 20% to - 40%	-	3.39	-	0.68
< - 40%	-	1.55	-	0.29
Observations	1,033	1,033	1,033	1,033

PANEL B: PRIMARY AND SECONDARY EARNERS

Surviving Spouses are:

Living Standard Reduction	Secondary Earners		Primary Earners	
	Percent With Potential Reduction	Percent With Actual Reduction	Percent With Potential Reduction	Percent With Actual Reduction
40% or more	32.53%	20.62%	1.94%	1.55%
20% to 40%	23.33	21.10	4.07	3.19
0% to 20%	20.52	22.17	16.26	12.88
No Reduction	23.62	4.07	77.73	13.55
0% to -20%	-	27.49	-	67.47
- 20% to - 40%	-	3.00	-	1.06
< - 40%	-	1.55	-	0.29
Observations	1,033	1,033	1,033	1,033

Source: Bernheim, Carman, Gokhale, and Kotlikoff (2001).

fielded by SRI International. In this section we present some of the findings reported in Bernheim, Carman, Gokhale, and Kotlikoff (2001), which compares actual life insurance holdings of households surveyed in the 1995 SCF with those recommended by our model.[4]

The 1995 wave of the SCF was conducted in the summer and fall of 1995. It surveyed over 4000 households nationwide including 2,874 married couples and 1,425 single individuals. A key feature of all waves of the SCF is the oversampling of the wealthy. The survey collected a wide range of information on demographics, finance, and expectations from the sample households. After eliminating observations with missing data, we included 1,033 couples in our final sample.

Accurate measurement of life insurance coverage is particularly critical for the analysis. The SCF survey data accounts for roughly 81 percent of aggregate in-force life insurance ($9.52 trillion out of $11.70 trillion) as reported by the American Council of Life Insurance. Since some life insurance policies are owned by companies, trusts, and foreign individuals rather than by U.S. households, the SCF figure appears to be in the right ballpark. Unfortunately, the SCF reports only total household life insurance holdings, not the holdings of each individual spouse. We used data from the 1992 HRS to impute this fraction for our sample households.

Table 3 compares total (husband and wife) levels of recommended and actual insurance. Panel A separates households into four roughly equal-sized groups based on their levels of recommended insurance. The figures in Column 3 suggest that there is essentially no relationship between the need to hold insurance and the likelihood of doing so. Stated differently, the decision to obtain insurance appears to be uncorrelated with underlying financial vulnerabilities. Moreover, as a comparison of the medians in Columns 4 and 5 indicates, there is only a very weak relationship across groups between actual and recommended insurance holdings. A similar conclusion follows from a comparison of means (Columns 6 and 7).

Panel B of Table 3 contains the same information as panel A, except that insurance levels are expressed as ratios to household earnings. Note that the actual ratio is lowest for the most vulnerable group (those with ratios of recommended insurance to earnings in

excess of 8). Moreover, regardless of whether one looks at medians (Columns 4 and 5) or means (Columns 6 and 7), the correlation of the ratio of recommended insurance to earnings with the ratio of actual insurance to earnings is very small.

Our study also included statistical tests that controlled for a variety of variables that might influence actual life insurance choice. These tests found essentially no relationship between actual insurance and recommended insurance at any age. This finding rules out the possibility that households purchase reasonable amounts of life insurance when young, but simply fail to adjust their holdings through time.

>>> THE IMPLICATIONS OF UNDERINSURANCE

Table 4 considers the impact of underinsurance on survivors. It compares the potential reduction of survivors' living standards were their spouses to die with no life insurance with the actual reduction these survivors would experience given reported insurance holdings. Results are presented for four different types of survivors – wives, husbands, primary earners, and secondary earners.

For survivors who do not need insurance to have as high a living standard as they formerly enjoyed, the potential reduction in living standard from having no insurance is obviously zero. Almost three quarters of husbands and close to four-fifths of primary earners fit this bill. In contrast, less than 30 percent of wives and less than one quarter of secondary earners face no potential reduction in living standard from the death of their spouse.

At the opposite extreme, over 30 percent of wives and almost a third of secondary earners, most of whom are wives, would, in the absence of any insurance protection, experience a severe (40 percent or greater) drop in living standard were their spouse to pass away. Another one-fifth of wives and one-fifth of secondary earners would experience a significant (20 percent to 40 percent) decline in their living standard were their spouses to die.

How well does the actual purchase of insurance do in preventing severe living standard declines among those

Table 5   Effect of Life Insurance on Changes in Living Standards for Surviving Spouses, by Level of Vulnerability

Surviving Spouses	Range of Potential Living Standard Reduction Ignoring Insurance	Mean		Insurance Holdings		
		Potential Living Standard Reduction	Actual Living Standard Reduction	Percent Uninsured	Mean Recommended Holdings	Mean Actual Holdings
Wives	40% or more	65.5%	47.6%	22.8%	$630,079	$166,628
	20% to 40%	30.1	17.2	14.8	908.146	265,210
	0% to 20%	10.3	1.7	10.5	107,633	133,122
	No Reduction	0.0	6.1	18.2	0	116,059
Husbands	40% or more	68.4	64.1	22.2	291,568	24,827
	20% to 40%	27.1	23.4	22.4	210,961	23,056
	0% to 20%	8.7	4.4	18.3	78,528	37,625
	No Reduction	0.0	2.9	16.7	0	42,545
Secondary Earners	40% or more	65.8	49.1	22.3	614,989	159,234
	20% to 40%	29.8	18.2	14.9	830,155	236,420
	0% to 20%	10.3	0.3	13.2	104,850	116,975
	No Reduction	0.0	6.9	16.8	0	125,237
Primary Earners	40% or more	66.4	53.2	30.0	274,272	35,598
	20% to 40%	26.8	21.5	26.2	243,488	44,115
	0% to 20%	8.6	3.1	15.5	79,962	51,181
	No Reduction	0.0	2.9	17.2	0	44,609

Source: Bernheim, Carman, Gokhale, and Kotlikoff (2001).

who are most at risk, namely secondary earners? The answer is not very well. Almost two-thirds of secondary earners who are at risk to experience a severe reduction in their living standards do not have enough insurance protection to keep that outcome from happening. This group constitutes over one-fifth of all secondary earners! This finding is so troubling that it bears repeating with different words: One in five married couples has a secondary earner who is dramatically underinsured against the death of her/his spouse.

And, as Table 4 indicates, this is not the end of the problem. Another fifth or so of secondary earners would face a major — 20 percent to 40 percent — drop in their living standard were the primary earner to die. All in all, almost two out of every three secondary earners is underinsured given their spouse's actual insurance coverage. Since roughly three out of four secondary earners would be underinsured were all primary earners to purchase no insurance, the actual purchase of insurance is making a pretty small dent in the incidence of underinsurance.

If most secondary earners are significantly or severely underinsured, what fraction of secondary earners are substantially overinsured? Table 4 provides the answer, namely about 5 percent; i.e., about 5 percent of secondary earners would experience a 20 percent or greater increase in their living standards relative to their living standard were their spouses to pass away leaving no insurance.

Table 5 examines the underinsurance problem in a different way. Rather than showing the fraction of spouses facing potential and actual living standard reductions, the table shows the average reduction facing those spouses. Again, we focus on secondary earners. Those with a potential severe living standard reduction would, on average, experience a two-thirds reduction in their living standard in the absence of any insurance protection. Insurance limits their living standard decline to roughly 50 percent. That is only a small improvement. The reason, as Table 5 indicates, is that these households have, on average, only $159,234 in life insurance, whereas they need to have $614,989. Indeed, 22 percent of these households have no insurance whatsoever.

Consider next the situation of secondary earners whose potential living standard reductions ranges

from 20 to 40 percent. The average potential reduction for this group is 29.8 percent. Their life insurance protection lowers this average to 18.2 percent. While life insurance protection is doing a somewhat better job in limiting the downside risk for these earners compared to those most at risk, it is certainly not dealing with the lion's share of the problem. The reason is that households with secondary earners who fall in this category hold, on average, less than a third of the amount of insurance they need. Average actual holdings of $236,420 are far below average recommended holdings of $830,155 in part because 15 percent of these households have no life insurance at all.

For those secondary earners who do not need life insurance to maintain their living standards, we find two things. First, over four fifths have insurance protection. Second, this protection raises their living standards as survivors on average by 7 percent. This suggests that excessive insurance coverage is not a real issue of concern.

Table 5 also indicates that for a fixed level of financial exposure, households were more inclined to protect women than men. For example, among severely at-risk husbands, insurance reduced the average consequences of the wife's death by only 6 percent (4.3 percentage points), from 68.4 percent to 64.1 percent. This contrasts sharply with the corresponding figures for wives. Couples with severely at-risk wives held, on average, a total of $166,628 in life insurance, while couples with severely at-risk husbands on average held only 15 percent of this amount —$24,827. Finally, note that the likelihood of a household holding insurance bears little if any relation to the potential exposure of the spouses. Indeed, the fraction of couples without life insurance is generally largest for those with the greatest financial exposure.

Table 6 provides disaggregated results for secondary earners broken down by the characteristics of their households. The table reports the share of secondary earners facing potential as well as actual living standard reductions of a) 40 percent or greater and b) 20 percent or greater. The table also shows the percentage difference between the potential and actual shares of secondary earners exposed to these risks. Problems of underinsurance are clearly more common among

Table 6 Share of Secondary Earners Facing Major Living Standard Reductions by Type of Household

| | Potential Living Standard Reduction | | | | | |
| | *40% or Greater* | | | *20% or Greater* | | |
	Actual Percent	Potential Percent	Reduction in Exposure Rate	Actual Percent	Potential Percent	Reduction in Exposure Rate
Full sample	20.6%	32.5%	0.366	41.7%	55.9%	0.254
HH earnings <$15K	46.2	53.9	0.143	53.9	64.1	0.159
HH earnings $15-45K	30.1	39.9	0.246	51.6	61.5	0.161
HH earnings $45-100K	15.0	28.9	0.481	40.0	56.5	0.292
HH earnings >$100K	9.5	21.4	0.555	22.0	39.9	0.449
Dual earners	17.1	27.8	0.385	41.9	57.6	0.273
Single earners	26.7	40.6	0.290	41.4	52.9	0.217
Earnings diff. 1-1 to 2-1	9.1	15.8	0.426	35.5	50.5	0.300
Earnings diff. over 4-1	28.0	42.7	0.344	43.6	55.8	0.219
Age of survivor <22	60.0	60.0	0.000	90.0	90.0	0.000
Age of survivor 22-39	31.1	47.4	0.344	62.6	78.5	0.203
Age of survivor 40-55	11.9	23.8	0.500	27.6	45.0	0.320
Age of survivor 56-70	7.6	10.8	0.293	13.4	19.1	0.298
Age of survivor >71	8.8	8.8	0.000	11.8	14.7	0.197
No children	19.2	26.9	0.286	37.2	46.5	0.200
One or more child	22.0	37.9	0.280	46.0	64.8	0.290
Whites	20.1	32.9	0.389	40.9	55.7	0.266
Non-whites	23.0	30.9	0.256	45.5	56.7	0.198

Source: Bernheim, Carman, Gokhale, and Kotlikoff (2001).

households with young spouses, lower incomes, greater income disparities between spouses, and non-whites. These households are also less likely to moderate the financial consequences of a spouse's death through life insurance. Age is a particularly important factor. Nearly two-thirds of secondary earners between the ages of 22 and 39 face actual living standard reductions of 20 percent or more and nearly one-third face reductions of 40 percent or more!

Results for older households in Table 6 are quite close to those reported by Bernheim, Gokhale, Forni, and Kotlikoff (2002) using the HRS. They found that 13.4 percent of secondary earners between the ages of 56 and 70 have significant uninsured vulnerabilities while 7.6 percent have severe uninsured vulnerabilities. For 60 to 69 year old survivors the corresponding figures are 14.1 percent and 8.9 percent – again quite close to the values for the oldest age group in Table 6.

Additional confirmation of the underinsurance problem comes from Berheim, Berstein, Gokhale, and Kotlikoff's (2002) study of 268 married couples in which one or both spouses work for Boston University. The couples were all taken through our model as part of the study. Although these couples tend to be better educated and have higher earnings than the general population and are forced by the University to purchase minimum levels of insurance coverage, almost 28 percent of the couple's secondary earners face 20 percent or greater living standard reductions given actual life insurance holdings. Of these, almost half face 40 percent or greater living standard reductions.

>>> POVERTY RATES AMONG WIDOWS

Do the SCF results help us better understand the high poverty rates among widows and widowers? They do, indeed. Assuming all sample households followed the life insurance recommendations from our model, sustainable consumption for 3.58 percent of surviving wives and 2.61 percent of surviving husbands would fall below the 1995 poverty thresholds published by the U.S. Census Bureau. Taking into account actual levels of insurance coverage, poverty rates would have been 10.45 percent among surviving wives and 4.16 percent among surviving husbands. These findings

imply that 66 percent (6.87 of 10.45 percentage points) of poverty among surviving women and 37 percent (1.55 out of 4.16 percentage points) of poverty among surviving men resulted from a failure to adequately insure survivors. Ignoring insurance, poverty rates would have been 13.17 percent among surviving wives and 4.26 percent among surviving husbands. Consequently, insurance eliminated only 28 percent of the avoidable poverty among surviving widows (2.72 out of 9.59 percentage points), and only 6 percent of the avoidable poverty among surviving men (0.1 out of 1.63 percentage points).

>>> CONCLUDING REMARKS

Research on life insurance adequacy reveals that underinsurance is prevalent. A significant fraction of secondary earners in married couples, the vast majority of whom are women, are significantly or severely underinsured against the untimely death of their spouse. What explains this finding? It does not seem to be price, because the life insurance industry is highly competitive and insurance premiums are generally quite reasonable. And it does not seem to be lack of available products or reminders that insurance is important. Life insurance companies, advertisements, and salesmen abound. Instead, questionable financial advice, inertia, procrastination, and the unpleasantness of thinking carefully about one's death are the likely culprits.

Studies of life insurance inadequacy may help sensitize the public to the magnitude of the problem, but they are not likely to radically change behavior. Given this, one needs to ask about the role of government in providing and/or mandating additional insurance coverage. Social Security survivor benefits represent a form of life insurance, and increases in their levels represents the surest and quickest means of alleviating the problem. Unfortunately, Social Security is in deep financial trouble and net benefit increases seem unlikely for the conceivable future. Perhaps the best one could hope for then would be a change in the mix of Social Security benefits in favor of survivor benefits at the price of reduced retirement benefits. But reducing Social Security retirement benefits would raise its own concern because the country not only has lots of underinsurers, but also lots of undersavers.

ENDNOTES

[1] All life insurance policies provide term insurance, which refers to the pure insurance provided by the policy in a given year. Some policies, called whole life policies, combine term insurance with saving. Paying premiums for a whole life policy is, roughly speaking, equivalent to contributing to one's saving account and also buying annual term insurance.

[2] ESPlanner[TM] was developed by the authors and their colleagues through their company Economic Security Planning, Inc. Research using the program is posted at www.ESPlanner.com.

[3] See the references for a list of these papers.

[4] Portions of this section draw heavily on Bernheim, Carman, Gokhale, and Kotlikoff (2001).

REFERENCES

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

Auerbach, Alan J., and Laurence J. Kotlikoff, "Life Insurance Inadequacy – Evidence from a Sample of Older Widows," National Bureau of Economic Research Working Paper No. 3765, 1991a.

Auerbach, Alan J., and Laurence J. Kotlikoff, "The Adequacy of Life Insurance Purchases," *Journal of Financial Intermediation*, 1(3), June 1991b, 215-241.

Bernheim, B. Douglas, Solange Berstein, Jagadeesh Gokhale, and Laurence J. Kotlikoff, "Saving and Life Insurance Holdings at Boston University – A Unique Case Study," mimeo, Boston University, 2002.

Bernheim, B. Douglas, Lorenzo Forni, Jagadeesh Gokhale, and Laurence J. Kotlikoff, "The Mismatch Between Life Insurance Holdings and Financial Vulnerabilities: Evidence from the Health and Retirement Study," *American Economic Review*, 2002, forthcoming.

Bernheim, B. Douglas, Katie Grace Carman, Jagadeesh Gokhale, and Laurence J. Kotlikoff, "The Mismatch Between Life Insurance Holdings and Financial Vulnerabilities: Evidence from the Survey of Consumer Finances," NBER working paper, no. 8455, October 2001.

Dorfman, Mark S. and Saul W. Adelman, "An Analysis of the Quality of Internet Life Insurance Advice," *Risk Management and Insurance Review*, 2002, forthcoming.

Gokhale, Jagadeesh, Laurence J. Kotlikoff, and Mark Warshawsky, "Comparing the Economic and Conventional Approaches to Financial Planning," in Laurence J. Kotlikoff, *Essays on Saving, Bequests, Altruism, and Life-Cycle Planning*, Cambridge, MA: MIT Press, 2001.

Holden, K.C., R.V. Burkhauser, and D.A. Myers, "Pensioners' Annuity Choice: Is the Well-Being of their Widows Considered?" University of Wisconsin Institute for Research on Poverty Discussion Paper 802-86, 1986.

Hurd, Michael D. and David A. Wise, "The Wealth and Poverty of Widows: Assets Before and After the Husband's Death," in D. Wise (ed.), *The Economics of Aging*, Chicago and London: University of Chicago Press, 1989, 177-99.

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