

The Adequacy of Life Insurance

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Introduction

Life insurance is easy to purchase. It's relatively cheap. And it's 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 so 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.

Unlike much economic research that delivers at least two answers to any given question, 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. For those who are buying no life insurance whatsoever, despite their considerable need, psychology appears to be trumping economics. For those who are buying life insurance, but the wrong amounts, bad financial advice may to blame.

Before presenting the evidence on actual behavior, let's consider what economic theory has to say about the purchase of life insurance and then compare it with the type of advice being handed out by financial planners and by conventional financial planning software programs. As we'll see, traditional financial planning prescribes inappropriate amounts of life insurance -- in some cases too high and in others too low -- because it is based on an economically unsound methodology.

How Much Life Insurance Does One Need?

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 homeowners 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 your household’s living standard no matter what transpires.

Note that consumption smoothing doesn’t 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, proper life insurance recommendations adjust for household composition. They also 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 providing them with a given living standard.

Also note that even when a household’s composition isn’t changing, consumption smoothing doesn’t dictate spending exactly the same amount each year. Special expenditures, like sending your 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 housing expenditures because changing homes generally entails large transactions costs.

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 doesn’t violate their borrowing constraints. But doing so turns out to be very difficult, indeed impossible, unless one has some very high-speed computer chips planted in one’s brain. Indeed, economists need to write computer programs that incorporate *dynamic programming* to solve borrowing constrained consumption smoothing problems. Dynamic programming is a relatively advanced mathematical technique. Although it is used routinely by economists in their research, it plays no role in traditional financial planning.

The dynamic program used to calculate a household’s smoothest living standard through time and, thus, the term life insurance needed each year to protect that living standard, needs to take into account a number of factors 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.

Properly calculating current and future taxes is extremely important for generating appropriate life insurance recommendations. But doing so isn’t easy. First, one needs to carefully calculate federal and state income taxes as well as payroll taxes on an annual basis and for all possible

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.

survivor configurations of the household. Second, calculating income taxes for future years requires knowing how much asset income the household will have 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 using additional special mathematical techniques.

Determining the future Social Security benefits to which a household will be eligible is another very complicated, but essential ingredient in coming up with proper financial advice. No program or financial advisor can properly recommend life insurance benefits without taking into account the full range of Social Security survivor, dependent, divorcee, child, mother, father, and retirement benefits available to the household.

To summarize, developing proper life insurance recommendations based on consumption smoothing is a very hard and complicated business, which requires using special mathematical tools, dealing in fine detail with the complexity of tax and Social Security benefit provisions, incorporating contingent plans, and taking liquidity constraints into account. Incorporating all of these features in a computer program that runs in finite time is a very major challenge. Given this, it's not surprising that traditional financial planning has avoided dealing with these issues by, in effect, making households come up with their own life insurance recommendations.

The Life Insurance Recommendations of Traditional Financial Planning

Imagine getting sick, going to your doctor, and asking him what's wrong. Rather than giving his opinion, he asks for your diagnosis. You give him your best guess, and he immediately writes a prescription for what you think ails you. Sounds crazy, right? Well, this is the state of play when it comes to getting a financial prescription from your financial planner, insurance agent, accountant, or other financial expert. It's also the state of play when it comes to getting financial advice from traditional financial planning software.

Traditional financial planners and traditional financial planning software asks households right off the bat how much they want to spend in retirement and how much they want their survivors to spend. Once the household provides these targets, the planner or software program calculates the amount of life insurance needed to cover those liabilities.

Some life insurance needs estimation software programs don't even bother asking households about their spending plans or desires. Instead, they simply use current income as a proxy for desired future spending. Others are even cruder and simply recommend that life insurance be set equal to a multiple of current income.

While asking households for their targets may seem reasonable, this *targeted liability* approach is really asking households to do all the hard work. Why? Because setting proper retirement and survivor spending targets (those that achieve consumption smoothing) is, as just discussed, extremely hard. And like prescribing your own medication, it's also very dangerous.

Households are bound to make targeting mistakes, and big ones at that. If households set their spending targets too low, they will find themselves being advised to undersave and underinsure. This means they will spend too much in the present and be forced to lower their living standards in the future – the opposite of consumption smoothing. If they set their targets too high, they’ll be instructed to oversave and overinsure. This means they will spend too little in the present and end up with a higher living standard in the future – again the opposite of consumption smoothing.

Calculating Life Insurance Recommendations with *ESPlanner*TM

*ESPlanner*TM is a new financial planning program that resolves the aforementioned problems with traditional financial planning.² Rather than ask households to specify their spending targets, the program finds the targets automatically. In so doing, the program plans for households rather than asking them to plan for themselves. The program uses dynamic programming techniques to smooth a household’s living standard over its life cycle to the extent possible without allowing the household to incur more debt than it’s willing to take on. In making its calculations, the program takes into account the non-fungible nature of housing, funeral and bequest plans, economies of shared living, the presence of children under age 19, the relative costs of children, and the desire of households to make “off-the-top” expenditures. In addition, the software simultaneously calculates the amounts of life insurance needed at each age by each spouse to guarantee that potential survivors suffer no decline in their living standards compared with what would otherwise be the case.

The program calculates recommended time-paths of consumption expenditure, taxable saving, and term life insurance holdings in constant dollars. Consumption in this context is everything the household gets to spend after paying for its “off-the-top” expenditures – its housing expenses, special expenditures, life insurance premiums, special bequests, taxes, and net contributions to tax-favored accounts. Given the household’s demographic information, preferences for consumption smoothing, and borrowing constraints, the program calculates the highest sustainable and smoothest possible living standard over time, leaving the household with zero terminal assets apart from the equity in homes that the user has chosen to not sell.

ESPlanner has highly detailed federal income tax, state income tax, Social Security’s payroll tax, and Social Security benefit calculators. The federal and state income-tax calculators determine whether the household should itemize its deductions, computes deductions and exemptions, deducts from taxable income contributions to tax-deferred retirement accounts, includes in taxable income withdrawals from such accounts as well as the taxable component of Social Security benefits, and calculates total tax liabilities after all applicable refundable and non refundable tax credits. These calculations are made separately for each year that the couple is alive as well as for each year a survivor may be alive.

² *ESPlanner* 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.

Moreover, the program's tax and benefit calculations for surviving wives (husbands) are made separately for each possible date of death of the husband (wife). That is, the program considers separately each date the husband (wife) might die and calculates the taxes and benefits a surviving wife (husband) would receive each year thereafter. *ESPlanner* achieves this simultaneous and consistent solution not only with respect to consumption and saving decisions, but also with respect to the purchase of life insurance.³

The program's algorithms are very complicated. But it's easy to check the reports to see that, given the inputs, preferences, and borrowing constraints, the program is recommending the highest and smoothest possible living standard that the household can sustain over time. The amount of recommended consumption expenditures needed to achieve a given living standard varies from year to year in response to changes in the household's composition. It also rises when the household moves from a situation of being liquidity constrained to one of being unconstrained. Finally, recommended household consumption will change over time if users intentionally specify that they want their living standard to change.⁴

Before turning to a comparison of *ESPlanner's* life insurance recommendations to those of the financial planning industry, a major caveat is in order. While the model deals with a host of critical issues associated with retirement and survivorship planning, it doesn't deal with all such issues. The program's greatest shortcoming here is in its treatment of uncertainty.⁵ The program doesn't explicitly deal with uncertainty in labor earnings, rates of return, health expenditures, disability, and demographics, including the possibilities of both divorce and remarriage.⁶ Instead, users are encouraged to consider alternative scenarios in thinking about non base-case outcomes. Were *ESPlanner* to incorporate these forms of uncertainty, its recommendations might differ. Hence, we view the program's recommendations as a very useful benchmark, but not necessarily as delivering the absolute truth, when it comes to saving and insurance recommendations.

ESPlanner's Recommendations

To get a sense *ESPlanner's* insurance recommendations, consider a simple married couple named Joe and Sue. Joe is 30, and Sue is 28. Both have a maximum age of life of 95. Joe earns

³ The program not only calculates the appropriate levels of life insurance at each age for each spouse when both are alive. It also determines how much life insurance each surviving spouse needs to purchase.

⁴ Unlike traditional financial planning, *ESPlanner* asks households to indicate not how much they want to spend in the future, but whether they want their living standard to be higher or lower in the future than in the present. If, for example, the household indicates it wants a 10 percent higher living standard in retirement, the program adjusts both its pre-retirement consumption recommendations down and its post-retirement consumption recommendations up until a) the 10 percent desired increase is achieved and b) the new consumption path is affordable and leaves no money on the table.

⁵ *ESPlannerPro*, which will shortly be released, incorporates rate of return uncertainty via Monte-Carlo simulations.

⁶ It's not clear that the potential for divorce with or without remarriage should influence term life insurance decisions. The reason is that while the couple is still married, they presumably are still in love and interested in protecting each other in the event of their pre-mature deaths. To the extent that couples are in the process of getting divorced or contemplating getting a divorce, the software permits them to run themselves as single taking into account the proceeds they'll receive from their divorce. In our research, we've assumed that married couples are still in love. In so doing, we may be overstating the degree of underinsurance.

\$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 30-year mortgage. Monthly mortgage payments are \$1,500. Annual property taxes are \$4,000. Homeowners 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.

Table 1 shows *ESPlanner's* insurance recommendations for this base case set of demographic and economic circumstances of Joe and Sue. It also shows how differences in their circumstances affect the program's 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. Take, 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, *ESPlanner* 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 doesn't need this part to maintain her higher living standard if Joe dies.

The next case entails Joe and Sue having a baby in 2002. While one might expect the addition of a child to raise life insurance needs, there are only modest increases in the program's 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. In addition, the additional child comes with her/his own Social Security survivor insurance protection and also raises the survivor protection afforded to Sue, which she'll receive in the form of Social Security mother's benefits if Joe dies prior to the new child reaching age 16.

Having a shorter maximum lifespan leads the couple to spend down their assets at a somewhat faster clip, which raises *ESPlanner's* insurance recommendations by small amounts. 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 the next to last row in which both spouses' earnings grow at 2 percent real.

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 by over \$300,000, while Sue's decline 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 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's going on. On the one hand, Joe needs more insurance because Sue isn't working. On the other hand, Joe needs less insurance because the living standard that needs to be protected had declined.

Comparing ESPlanner's and Traditional Life Insurance Recommendations

Let's now compare *ESPlanner's* Joe-Sue base case recommendations (\$1,056,827 in term life insurance coverage for Joe and \$37,778 for Sue) with those provided by the two alternative life insurance calculators posted by Company A -- a major financial institution that sells mutual funds and life insurance. The first of these calculators tells you to purchase life insurance equal to between six and ten times your current income. You plug in your income, and it displays two values -- one equal to six times your income, the other equal to ten times your income.

Company A's second calculator uses current income as the reference point for setting post-retirement and survivor spending targets. The website states that "Analyzing your capital needs is a more thorough way to decide how much insurance protection you need. It considers not only your annual income, but also your debts, savings and other assets, final expenses, future education expenses for your children, and numerous other factors. While it takes a little longer, our capital needs worksheet will provide a coverage recommendation more closely tailored to your specific circumstances and the needs of those who depend on you."

Company A's first calculator recommends a range of \$600,000 to \$1,000,000 for Joe's life insurance and a range of \$300,000 to \$500,000 for Sue's. If the couple opts for the high end of these ranges, the recommendation for Joe will, according to our model, be about right, while that for Sue will be 13 times too high! If the couple opts for the lower end of these ranges, the recommendation for Joe will, compared to our model, be two fifths too low and that for Sue will be 8 times too high!

Having too much insurance is clearly not as bad as having too little. So the big concern here is that Joe will be "advised" to purchase only two fifths of what he really needs. The implications of this for Sue and the children aren't pleasant. If Joe dies with only \$600,000 in life insurance, Sue and the children will suffer a 20 percent reduction in their living standards.

Company A's second calculator recommends \$1.8 million in life insurance for Joe and \$1.0 million for Sue.⁷ Thus, for the couple as a whole, this calculator is recommending almost three times the amount of insurance actually needed, according to our model. If Joe and Sue follow this "advice," they will end up spending over a thousand dollars more than they should on life insurance premiums in the current year alone.

Company A's calculators are just two of the hundreds, if not thousands, of life insurance calculators available on the web that provide equally suspect recommendations. The recommendations of these calculators can differ dramatically. Take, for example, the recommendations of Company B's -- a second very large financial company selling mutual funds and life insurance. It recommends \$427,500 in life insurance coverage for both Joe and Sue. Hence, if Joe follows Company B's advice, he'll end up purchasing less than half the insurance he needs to protect his family. And if he passes away, Sue and the two children will suffer close to a 30 percent decline in their living standard.

For a price, both Company A and Company B will provide Joe and Sue with financial planners who will produce a comprehensive financial plan for the couple. The life insurance recommendations emanating from those plans may be quite different from those generated by the two companies' web calculators. If they are, the companies should be asking themselves whether they are doing more harm than good in posting their web calculators. If they aren't, the companies should be asking themselves why they are charging for this service.

ESPlanner's Recommendations Versus Those of Quicken Financial Planner

Additional support for our concern about the quality of life insurance recommendations being provided to the American public comes from a comparison of saving and life insurance recommendations of *ESPlanner* with those of *Quicken Financial Planner*.⁸ This comparison appears in a paper we wrote together with Dr. Mark Warshawsky, former Director of Research of the TIAA-CREF Institute and currently a senior economist with the U.S. Treasury.⁹

Quicken Financial Planner is designed to aid in financial planning for retirement, children's college education, and life insurance needs. Like *ESPlanner*, the program solicits from the household current and expected future demographic and economic data. But unlike *ESPlanner*, which calculates taxes independently in each year and under each survivor contingency, *Quicken Financial Planner* asks its users to specify pre- and post-retirement combined federal- and state-income tax rates. *Quicken Financial Planner* also provides its users with rough estimates of their Social Security benefits.

⁷ In running this calculator, I assumed that each spouse needed income replacement through retirement.

⁸ *Quicken Financial Planner*, which is produced by Intuit, Inc. is no longer marketed as a separate product. Instead, elements of the program are included in *Quicken*.

⁹ See Gokhale, Jagadeesh, Laurence J. Kotlikoff, and Mark Warshawsky, "Comparing the Economic and Conventional Approaches to Financial Planning," in *Essays on Saving, Bequests, Altruism, and Life-Cycle Planning*, Cambridge, MA.: MIT Press, 2001.

Like virtually all financial planning programs, *Quicken Financial Planner* is designed to help users achieve user-specified saving and insurance goals, rather than to smooth their living standards. Users are asked to specify their current expenditures and set future spending targets with reference to their current spending. In our study with Dr. Warshawsky we attempted, to the extent possible, to use *Quicken Financial Planner* to achieve life-cycle consumption smoothing. We did so by iterating on the program's post-retirement spending target until it produced post-retirement spending levels that were close to per-retirement ones.

Our study compared the two programs' saving and insurance recommendations for 24 couples, 20 of whom are stylized and the other four of whom are 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. To quote the paper, "The two software programs recommend dramatically different levels of saving or life insurance in each of the 24 cases." This finding is even more worrisome than it may seem because had we simply adopted arbitrary saving and insurance targets, the discrepancies in recommendations between the two programs would likely have been even greater.

The differences between the two software programs' recommendations reflect differences between the programs in their treatments of demographics, economies in shared living, taxes, Social Security benefits, and borrowing constraints.

Comparing Actual with Recommended Insurance Holdings

The above stated concern about bad financial advice would be a non issue were households somehow finding their way to purchasing the correct amounts of life insurance. Unfortunately, this is not the case. 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.¹⁰ These data sets include the Retirement History Survey, the Health and Retirement Study, the Survey of Consumer Finances, a survey of Boston University employees, and a survey 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 Survey of Consumer Finances (SCF) with those recommended by *ESPlanner*.¹¹

The 1995 wave of the SCF was conducted in the Summer and Fall of 1995. It surveyed over 4000 households. A key feature of this and, indeed, all waves of the SCF is the oversampling of the wealthy.¹² The survey, which is nationwide, collected a host of demographic, economic, financial, and expectations information from the sample households. After excluding observations with missing data, we arrived at a final sample of 1,033 couples.

¹⁰ See the references for a list of these papers.

¹¹ Portions of this section draw heavily on Bernheim, Carman, Gokhale, and Kotlikoff (2001)

¹² The SCF sampled 2,874 married couples and 1,425 single individuals.

Accurate measurement of life insurance coverage is, of course, 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 Health and Retirement Study (HRS) to impute this fraction for our sample households.

Table 2 compares total (husband and wife) levels of recommended and actual insurance. Panel A groups households into four roughly equally sized categories based on their levels of recommended insurance. The figures in the third column 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 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 2 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 ratios of 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 correct amounts of life insurance when young, but simply fail to adjust their holdings through time.

The Implications of Underinsurance

Table 3 considers the impact on survivors of the purchase of inappropriate amounts of insurance coverage. 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 don't 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 husband 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. Fewer than two percent of primary earners, almost all of whom are husbands, find themselves in this boat. 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 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 don't 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 3 indicates, this isn't 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 3 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 4 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, let's 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's not much of an achievement. The reason, as Table 4 indicates, is that these households have, on average, only \$159,234 in life insurance, whereas they should have \$614,989. Indeed, 23 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's 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 don't 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 4 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 5 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 low-income households, couples with disparate earnings, relatively young households, couples with dependent children, and non-whites. Households with young spouses, lower incomes, greater income disparities between spouses, and non-whites 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!*

Table 5's results for older households are quite close to those reported by Bernheim, Gokhale, Forni, and Kotlikoff (2002) using the Health and Retirement Study. 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 5.

Additional confirmation of the underinsurance problem comes from Bernheim, 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 *ESPlanner* 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 *ESPlanner's* insurance recommendations, 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).

Policy Implications and Conclusion

Research on life insurance adequacy reveals a real problem. 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 the failure of these households to buy adequate amounts of insurance coverage? It's not likely to be price, because the sale of life insurance is a highly competitive business and insurance premiums are generally quite reasonable. And it's not lack of available products or reminders that insurance is important. Life insurance companies, advertisements, and salesmen abound. Instead, bad financial advice, inertia, procrastination, and the unpleasantness of thinking carefully about one's death are the likely culprits.

Bad financial advice can be replaced by sound advice, but motivating households to seek advice and act on it is another matter. Studies of life insurance inadequacy may help sensitize the public to the magnitude of the problem, but they aren't likely to radically change behavior. Given this, we need 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.

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Table 1

***ESPlanner's* Life Insurance Recommendations
Under Alternative Assumptions**

Case	Joe's Recommended Insurance	Sue's Recommended Insurance
Base Case	\$1,056,827	\$37,778
\$400,000 More in Assets	\$925,750	\$0
Joe Inherits \$1 Million in 5 Years	\$1,690,261	\$0
Joe and Sue Have a Baby	\$1,070,504	\$66,503
Joe and Sue Set their Maximum Lifespans to 90	\$1,077,517	\$63,877
Joe and Sue Retire at 60	\$948,868	\$96,956
Joe and Sue Earn a 6% Real Return	\$706,208	\$0
Joe's and Sue's Real Earnings Grow at 2%	\$1,228,376	\$22,032
Sue Doesn't Work	\$1,172,971	\$0

Table 2 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
\$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
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 3 Distribution of Potential and Actual Reductions in Living Standards of Surviving Spouses

Panel A: Husbands and Wives

Living Standard Reduction	Surviving Spouses			
	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%
20% to 0%	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	1033	1033	1033	1033

Panel B: Primary and Secondary Earners

Living Standard Reduction	Surviving spouses are:			
	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%
20% to 0%	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	1033	1033	1033	1033

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

Table 4: 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%	1.68%	10.5%	107,633	133,122
	No Reduction	0.0%	6.14%	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)

Table 5

**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	9.52%	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	9.07%	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	7.64%	10.8%	0.293	13.4%	19.1%	0.298
Age of survivor: >71	8.82%	8.82%	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)

