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TRENDS AND ISSUES

Life Insurance Coverage: How Much Is The Right Amount?

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EXECUTIVE SUMMARY

A fundamental part of risk management for individuals, like companies, is to preserve and protect assets. For the individual, the greatest asset frequently is her or his earning capacity. The death of an individual results in the loss of this asset. Life insurance is a risk management tool available to protect against this loss.

This *Trends and Issues* report focuses on two themes. The first and most important is a *general process* for examining how an individual should determine the amount of life insurance coverage necessary. The second is an examination of the environment that affects the process.

Estate planning models can provide an economic framework for determining the resources necessary to meet estate planning needs. Life insurance is a key resource in the estate planning process. Ascertaining the amount of life insurance necessary, like the estate planning process, should be done on a continual basis. The amount of coverage should be re-evaluated every time there is an important change in an individual's environment. There are three factors that affect an individual's environment: personal factors, economic factors and social factors. There often is an overlap between these sets of factors.

How much life insurance should an individual purchase? The answer is "The amount of coverage needed is not constant." It varies over time, sometimes significantly. It is always equal to the difference between an individual's goals and an individual's resources. While models may include many of the concepts in this paper, it should be noted that an individual should always rely on their own analysis. The key to determining the amount of insurance is continually reviewing goals and resources. By doing this, a consumer reduces the impact of changes in societal, economic and personal factors.

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RISK MANAGEMENT

A fundamental part of risk management for individuals, like companies, is to preserve and protect assets. For the individual, the greatest asset frequently is her or his earning capacity. A number of events can result in the loss of income or the diminution of assets.

Disability is an example of an event that not only reduces earnings potential, but also can result in a reduction in an individual's assets. Risk management tools exist to handle disability risk. For example, Social Security, in some cases, provides coverage for a disabled individual. A person also can purchase disability insurance on an individual basis or a group basis.[1,1]

The death of an individual can result in a loss of income or a reduction in assets. Risk management tools also are available to protect against this loss. Social Security may provide protection; the coverage is for survivors. Individuals also can set aside assets to cover the loss of earnings that would be caused by a death. Or, life insurance coverage can be purchased on an individual or group basis.

This *Trends and Issues* report focuses on several themes. The first and most important is a *general process* for examining how an individual should determine how much life insurance coverage is necessary. The second is an examination of the environment that affects the process.

A GENERAL PROCESS FOR DETERMINING THE AMOUNT OF COVERAGE

THE CONCEPT OF GOALS

Estate planning models can provide an economic framework for determining the resources necessary to meet estate planning needs—one key resource is life insurance. It is critical that individuals realize that estate planning is an ongoing process. Relying on

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[1] While premature death (death prior to the end of an individual's earning cycle) is a significant risk for individuals, other risks such as superannuation (living so long that a person outlives their assets) and disability are also significant exposures. These are not discussed in this paper, but they are part of any risk management plan. It should be noted that individuals are concerned about premature death, but often overlook exposures like disability. Yet, the probability of being disabled for six months or more between the ages of 21 and 65 is much higher than the probability of dying.

[1] Social Security benefits are predicated on an individual having a minimum number of earned quarters of coverage.

one model or a single iteration of a model can be problematic because most models are not capable of dealing with all of the changes that can occur in an individual's life.[2] It also is important that individuals understand the impact assumptions have on estimates of resources needed. Running information through a model without an understanding of the assumptions utilized in the model can result in over- or under-estimates of the resources that are needed. Both types of errors can be costly.

Life insurance is a key resource in the estate planning process. Ascertaining the amount of life insurance necessary, like the estate planning process, should be done on a continual basis. The amount of coverage should be re-evaluated every time there is an important change in an individual's environment. There are three factors that affect an individual's environment: personal factors, economic factors and social factors. Each of these is discussed in more detail later.

An example illustrates the need for coverage evaluation. Assume that in the past, two partners analyzed their coverage needs and ascertained that $500,000 of life insurance coverage had to be purchased on the life of each partner. Following the purchase of the coverage, one of the partners receives a twenty percent salary increase. What impact will this have on the need for life insurance coverage? Exhibit 1 contains several options that the couple may elect as the result of the raise.

The partners may decide to adopt a child (Option 1). In this case, additional coverage on both partners may be warranted. Additional coverage also may be warranted for both partners if they decide to buy a new home or new cars, i.e., take on incremental debt (Option 2). Option 3 presents a totally different perspective. The partner who does not get the raise elects to go back to school and get a graduate degree. This should increase earnings in the long run. In the short run, there may be a need to buy more coverage on the partner who received the raise and to leave coverage on the partner who is returning to graduate school at the same level; or, perhaps to reduce it.[3] Unfortunately, insureds frequently do not re-evaluate their life insurance coverage needs when a major change

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[2] For an example of the use of programming software for ascertaining life insurance coverage, *see* "The Adequacy of Life Insurance," Jagadeesh Gokhale, Laurence J. Kotlikoff , *TIAA-CREF Institute Research Dialogue, Issue no. 72, July 2002*. In addition to software models, individuals can use other estate planning tools, e.g., estate planning templates to do estate planning.

[3] Depending on the type of coverage that has been purchased, it may not be possible to reduce the coverage. For example, if the coverage is a $500,000 term policy, it generally is not structured so that the coverage can be reduced. It is an all or nothing situation. Whole life and universal life insurance do offer some flexibility.

occurs. It is for this reason that the author stresses the need for regularly analyzing life insurance needs.

Exhibit 1: Impact of Salary Increase
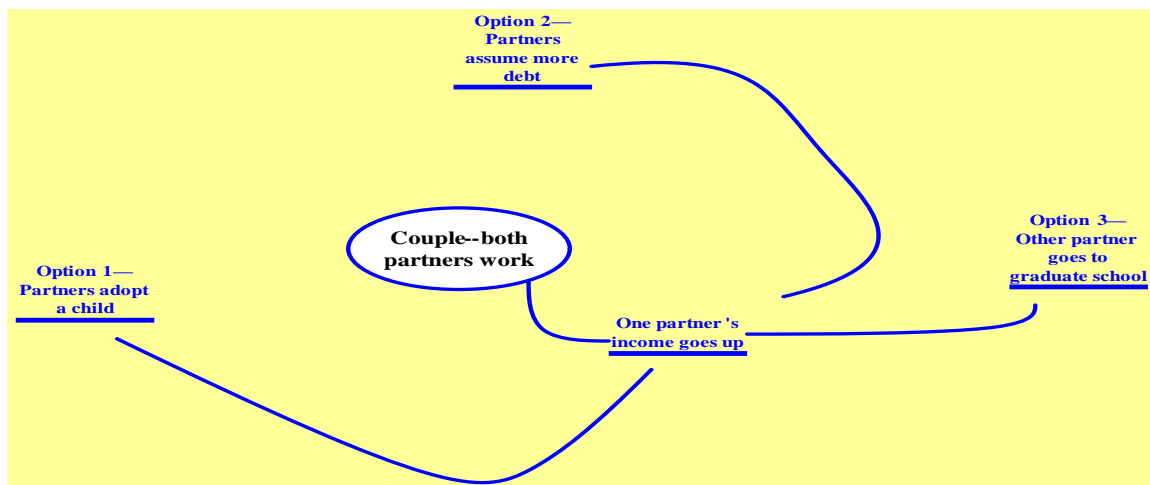
SETTING GOALS TO DETERMINE COVERAGE NEEDS

Let's assume we have a couple comprised of Edward and Martha Roberts. Both partners have full time jobs and are in their early thirties. They have no children. The economically rational person might say that, since both individuals have full time jobs, life insurance is not necessary, or at best, it is only needed to cover funeral expenses or short-term debts. In order to determine if this is a valid assumption, it is necessary for the couple to do a flow chart to determine their coverage needs. Exhibit 2 provides a tool to start the process. Note that life insurance is not intended to take care of the needs of the insured, but to see that the insured's wishes are met after his or her death.

Exhibit 2: Step One in Coverage Decision – Selecting Goals for Martha Roberts

To this extent, life insurance functions as a will. What is often referred to as the "expenses" that need to be covered by insurance are in reality the insured's set of goals. It is the *goals* that are the most important part of any coverage analysis process.

Assume that Martha has two basic goals. One is to pay off certain debts. The other is to leave funds to her favorite charities. At first glance, these may seem to be straight forward goals. However, examine goal one; paying off debts can involve incremental decisions. Take the objective of paying off the mortgage. Does Martha want to pay off the entire mortgage on the home or should only enough coverage be provided to assist in making the house payments? That is, should the life insurance protection be sufficient to pay the proportionate share of the mortgage payment that Martha's income currently covers? If Martha makes half of the house payment prior to death, perhaps only enough life insurance should be purchased to make half the payment if she is deceased. Going one step further, Martha may only want to provide sufficient insurance to assist Edward with the mortgage payment for three to five years—assuming his salary will increase sufficiently during this period to allow him to make all of the payments. This only examines Martha's goals. Edward's goals as the survivor may differ with Martha's; they may even conflict. For example, Edward may not want to keep the house and would prefer that a lump sum be provided that would allow him to purchase a smaller home or a condominium. Or, he may feel that Martha's goals should not include funds to pay for housing expenses.

Martha's second goal is to provide funds to three charities—her alma mater, her church and the United Way. This question also should be further refined. Does she want to leave equal amounts? Does she want to purchase individual life insurance policies payable to

the charities and/or which the charities own?[4] Or, does she want the gifts to flow through her estate where the gifts can be handled either by paying out a portion of her assets or disbursing life insurance proceeds? In summary, selecting the goals can be challenging and probably requires good communications between the insured and the insured's partner and the proposed beneficiary, if not the partner.

Fast forward twenty-five years. Edward and Martha are in their late fifties. Edward has been granted stock options by his employer that can be exercised before his death or upon his death. Edward and Martha have one child and two grandchildren. Their child is divorced. And, their accountant has just told them that they are now facing severe estate tax problems. Edward's goals may resemble those shown in Exhibit 3. Based on this exhibit, Edward needs sufficient assets to handle debts and estate taxes, while providing a residual amount to send his grandchildren to college, allow Martha to exercise the stock options and, perhaps, provide for Martha's retirement. Life insurance coverage would certainly be a method for meeting one or more of these needs.

Exhibit 3: Selecting Goals for Edward Roberts

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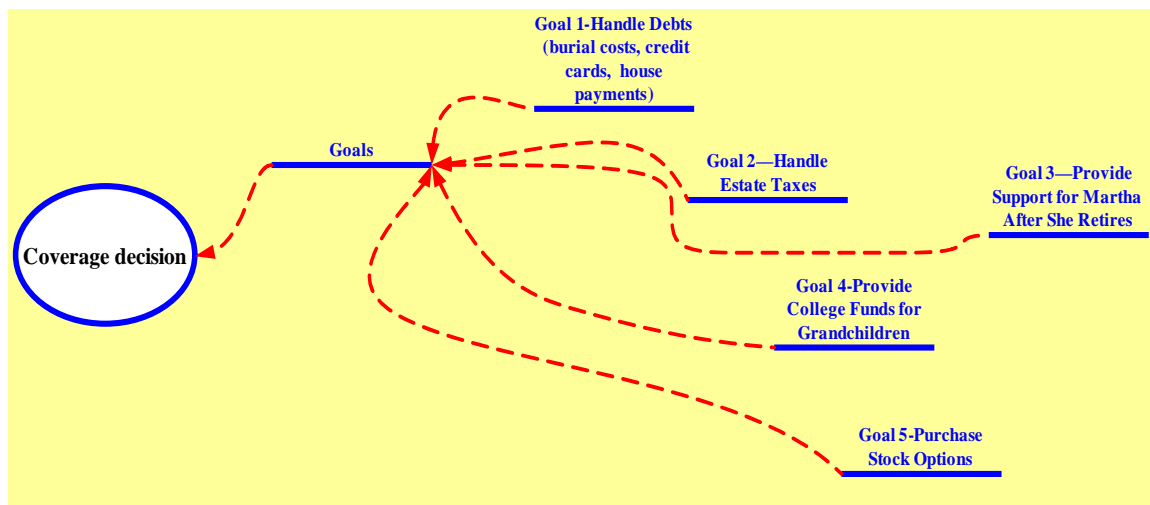
[4] It is not mandatory that the coverage be owned by the charities, but there are some tax reasons this might be an appropriate method for making the donation.
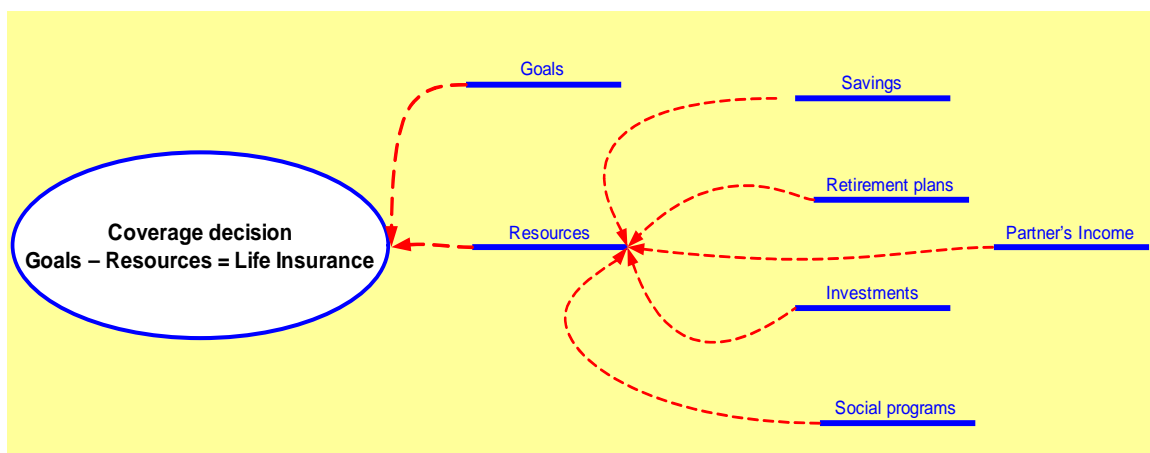
RESOURCES

Making an insurance coverage decision depends not only on the goals but also on the resources available to meet the goals. Exhibit 4 enhances Exhibit 2 by adding the resources component. Just as Exhibit 2 did not show all possible goals, Exhibit 4 is not intended to show all possible assets.

Exhibit 4: Evaluating Resources for Martha Roberts

Assume that Martha has five potential resource components that can be utilized to meet her goals. Three of the resources are self explanatory—savings, investments and retirement plans. The other two require more analysis. The first is a partner's earning capacity. It is a resource that should be used to offset goals where possible. This income can be utilized to offset everything from debt reduction to burial expenses. In some cases the partner's income may significantly reduce the need for life insurance coverage, particularly if it appears that the partner's salary will continue to grow. The second item that requires analysis is income from social programs. In Martha's case, there are no social program benefits, e.g., Social Security. If she is qualified, her husband will receive the minor burial benefit ($255) that is provided. Social Security might provide more extensive coverage if there were children, Martha had a sufficient number of earned quarters of coverage and Edward was a stay at home parent.[5]

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[5] For a detailed description of Social Security benefits see www.ssa.gov.

If the goals exceed the resources, the difference, as shown in Exhibit 4, can be handled by life insurance. There are several considerations that will dictate whether life insurance coverage equal to the difference between the goals and the resources can be purchased; the most important factor is the cost of the insurance coverage. Cost is affected by several parameters. Some of the more important and better known are the amount of coverage, the type of coverage and the age of the potential insured. These are discussed extensively in other publications. They are briefly discussed in the footnote below.[6]

Perhaps the factor that is not considered as often is the health of a potential insured. Exhibit 3 shows Edward's goals when he is in his fifties. If he does not already have insurance coverage, obtaining coverage may be problematic. Suppose that Edward has developed high blood pressure, high cholesterol, or heart problems. One of two things will occur. Either he will not be able to get coverage because he is too great a risk, or he will have to pay more for his coverage because he is not healthy relative to other individuals in his age group.

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[6] The face amount of coverage affects a life insurance premium. The more coverage an individual purchases the higher the premium. Premium is also affected by the type of coverage. A brief summary of the three types of coverage, term insurance, whole life and universal life, follows. *Term life* insurance usually covers an insured for a period of one, five, ten or twenty years, and pays if the insured dies during the period. Some term policies are written to cover to a specific age, e.g., term to 65. Term insurance eventually expires, but some term policies allow a person to renew coverage for another term. A ten year term policy issued to someone at age thirty five might allow the insured to renew the policy for ten more years when he or she becomes age 45. The annual premium for the second ten years is higher than the premium for the first ten years of coverage because there is a higher probability that the insured will die during the term. *Whole life* insurance, as the name implies, is written for the entire life of the insured. Premiums may be paid as long as an insured is alive or for some shorter period if the insured can afford a higher premium. Whole life policies build up a cash value because they eventually will pay the face amount of coverage. The premium for whole life coverage is higher than the premium for term since the company knows it will have to pay a claim under the whole life policy. A *universal life* policy is similar to a whole life policy except the insured takes some of the investment rate risk. If interest rates rise, the premiums go down or the value builds up more rapidly. If interest rates decline, premiums go up or the value goes down. Regardless of the type of coverage purchased, the older the potential insured, the higher the premium.

TIMING OF GOALS AND RESOURCES

A critical component of matching goals and resources is the timing of the cash flows. In Martha's case, she has a number of goals that she might prefer were paid off immediately. Examples include paying for funeral expenses, paying off credit cards or other short-term debt, and paying off the mortgage. If these expenses are paid off immediately, then there is no need to consider the time value of money. Available resources will be used immediately to retire debt.

However, let's assume that Martha only desires to have sufficient resources to pay off her short-term debt and her funeral expenses. She does not want to pay off the mortgage right away. Instead, she plans to have a sufficient amount to pay her half of the mortgage for five years—which she feels should be adequate time for Edward's income to increase so that he can afford the entire payment. Assume that the payments that Edward and Martha make each month on their home are $3,600, including taxes and insurance and that Edward would put any liquid resources from Martha's estate (whether life insurance proceeds or not) into certificates of deposit. In this case, if Martha wanted to include the mortgage goal in her planning, it would be simple to calculate how much would be needed. For example, the present value of $1,800, her half of the payment, for a period of 60 months at an annual interest rate of 8.1475% would be $89,070.98.[7]

Of course, interest rates are not stable. Exhibit 5 shows the Certificate of Deposit Index[8] for the period from December 1990 until September 1992. In December 1990, the Certificate of Deposit Rate was 8.1475%. By September of 1992 it had dropped to 4.05%. In the example above, a rate of 8.1475% was used to calculate the present value. If an annual rate of 4.05% were used instead of 8.1475%, the present value of the house payments would increase to $97,794.12. Thus, Martha's estate would need to be increased $8,273.14 ($97,794.12 - $89,070.98) if she assumed an interest rate of 4.05%. While certificates of deposit rates do not frequently decline fifty percent in less than two years, it is this type of variability that needs to be considered by individuals when planning how to meet their goals.

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[7] The present value of a stream of payments equals the payment amount multiplied by $[(1 - (1 / (1 + i)^n)) / i]$, where "i" is the assumed interest rate and "n" is the number of payments. In this case the annual interest is assumed to be 8.1475 percent. Since "n" in this case is in months, the monthly rate is determined by taking 1.081475 to the $1/12^{th}$. The monthly rate is .6802 percent.

[8] The Certificate of Deposit Index is the 12 month average of the monthly average yields for the 3-Month Certificate of Deposit rate.

Exhibit 5: Certificate of Deposit Index
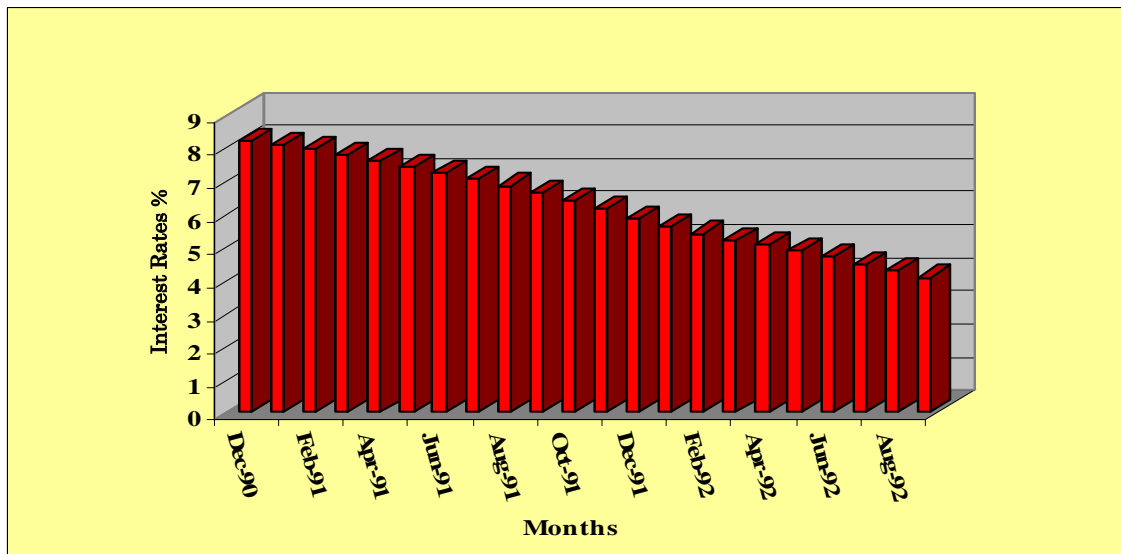
THE ENVIRONMENT FOR SETTING GOALS

Goals are affected by three general types of factors—*personal factors*, *economic factors* and *societal factors*. Goal setting would be easier if each set of factors were totally independent. However, there often is an overlap between these sets of factors. The material that follows gives a few examples of each factor type. At the end of the review the potential interaction of factors is discussed.

PERSONAL FACTORS

The number of personal factors is extensive. A few are listed below along with considerations for each:

Exhibit 6: Personal Factors

Factor	Considerations
Children	cost of health care, housing, clothing, education during formative years
Grandchildren	same as the considerations for children, but usually more emphasis on education
Partner	income, income potential, housing needs, child care, health coverage
Parent(s)	need for support, extended care and health insurance
Job selection	type of job, job security, income potential
Life style	costs associated with mortgage, credit card debt, club memberships, cars
Life expectancy	partner will need coverage, potential for insured not needing the same amount of life insurance, impact of parents living longer

This brief list raises some interesting issues that need to be considered when setting goals and deciding how much life insurance to buy. Let's focus on just two segments of the factor list: *children* and *life expectancy*. The traditional assumption has been that life insurance coverage is based on the need to raise children at least until they are 18. In most cases, parents want to assist children beyond this point if the children go on to obtain an undergraduate degree. Some parents even provide financial assistance when their children seek graduate degrees. Under the traditional model, life insurance would no longer be needed to cover the cost of raising children once they completed their education. As a result, insureds either reduced their life insurance coverage, or they rearranged their goals to use the coverage to handle other needs that might arise.

Parents who assume their children will never move back home and therefore see no need to continue the life insurance that covered the children's expenses may be unrealistic. "In today's environment children often move back home. According to new information from *Statistics Canada*, over 40% of adults in their 20s lived with their parents in 2001. For males, the 2001 number is 47%, up from just 27% in 1981."[9] In the United States, however, it is not just the twenty year olds moving home; parents should not be surprised

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[9] *What Empty Nest? Adult Children Living at Home*, Article posted July 26, 2004, on www.PioneerThinking.com.

if their 30, 40 or even 50 year old children want to move home. This makes estate planning and ascertaining how much life insurance to buy more challenging.

Life expectancy (the average number of years an individual at a particular age is expected to live) has steadily increased as shown in Exhibit 7. While the general population in the United States is living longer, an individual's life expectancy is affected by everything from where she or he lives to whether they exercise; from what they eat to their DNA make up.

Exhibit 7: Life Expectancy at Birth
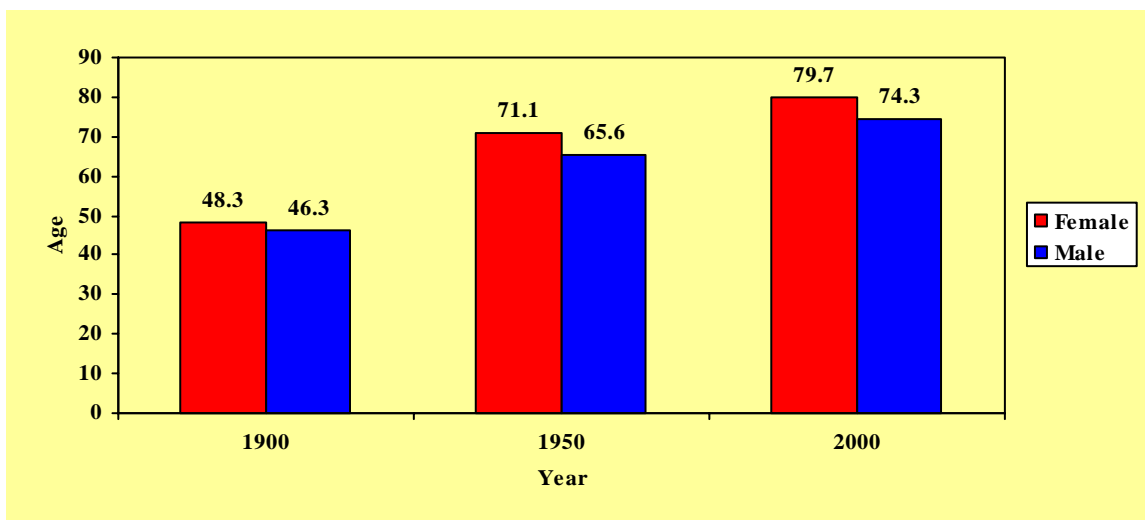
The increase in life expectancies has created numerous challenges for individuals. Planning how much a partner will need to take care of himself or herself through retirement has become more difficult. It should be noted that Exhibit 7 points out a significant difference between the life expectancy of men and women. Women born in the year 2000 have a life expectancy approximately five years longer than men. This has significant goal setting implications.

Another area where life expectancy is having an impact is care for parents. Deciding if you need to provide assets for an elderly parent who may outlive you by several years has become a difficult decision.

ECONOMIC FACTORS

Exhibit 8 shows a few examples of the important economic factors. It is difficult to take into account even these few economic factors because there is significant correlation between the factors and because these factors can change dramatically in a very brief time period. When setting goals, individuals should base the goals on the broader economic factors and not get mired down in the economic weeds.

A brief review of just two of the economic factors shown in Exhibit 8 will provide some insight. Consider interest rate shifts. If interest rates move, individuals with adjustable rate mortgages are affected. For example, upward movements in interest rates will result in increased mortgage payments. This in itself can make meeting goals difficult because it is difficult to guess what the mortgage payment on a house may become. The problem is exacerbated if an individual has an adjustable rate mortgage and he or she also has a loan that required no down payment. The result of interest rate increases can be that house sales slow, the prices of houses decline and the surviving partner is in a position where he or she has a negative equity position in a house. Thus, the goal becomes allowing a surviving partner to have enough funds to sell a home even if funds have to provided at closing because the loan value exceeds the sale price of the house.

Exhibit 8: Economic Factors

Factor	Considerations
Stock market	impact on value of resources and goals
Inflation	impact on purchasing power
Interest rates	impact on mortgages, short-term debt, loans
Retirement plans	security of plan and type of benefit
Industry fluctuations	ability to accumulate resources to meet goals, need for life insurance
Exogenous impacts	ability to disrupt overall planning
Stock market	impact on value of resources and goals

Retirement plans are another area that can affect goal planning. There are two critical issues. The first is the type of plan. There are two types of employer plans—defined benefit and defined contribution. Under a defined benefit plan, an employee is guaranteed a fixed payment per month for life at retirement. The amount paid is normally a function of the number of years worked and the final average compensation. This type of plan makes it easier to set goals because it is relatively simple to ascertain

the retirement income payments. Under a defined contribution plan, the employer and/or employee contributes a certain amount into an account for the employee. At retirement, the employee's retirement benefit is the balance in the account (contributions plus investment returns)—but there is no guaranteed, fixed amount that will be available. The employee can use the retirement benefit to pay for retirement expenses, but, unlike a defined benefit plan which is guaranteed for life, the defined contribution account balance may be exhausted by the retiree unless annuitized. This can make planning more challenging.

The second issue to consider with retirement benefits is the security of the plan. If a defined benefit plan sponsor becomes insolvent and seeks protection under the bankruptcy laws, employees may face reduced benefits under the plan.[10] A defined contribution plan does not involve such a risk, but it does involve investment risk since account balances are typically invested in equities and/or bonds.

Of course individuals trying to plan cannot make adjustments to deal with all the exogenous events that may impact their goals. Increasing gas prices can produce disequilibrium. International financial market shifts can produce financial shock waves. And, governmental instabilities can cause ripple effects.

SOCIETAL FACTORS

The third set of factors that can affect goal setting are societal in nature. Shifts in governmental spending can result in increased employment or unemployment. Tax changes can make one goal obsolete and another desirable. Changes in government programs for the elderly, such as a reduction in the growth rate of Social Security benefits or an increase in Medicare premiums can have an impact by increasing the responsibility of children for the support of their parents. Changing demographics, technology, mores and philosophies also can impact goals.

There is virtually no limit to what government can do, how economic markets can change, or how personal situations can vary. It might seem that the process is so complex that it is pointless to set goals. It might seem that it is pointless to try and calculate resources, or to try and ascertain how much life insurance to purchase. Models might seem useless. In fact, the complexity of considering the many variables causes some individuals to just

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[10] Private-sector defined benefit plan benefit payments are insured up to a limit by the Pension Benefit Guaranty Corporation.

buy some life insurance without consideration of goals and resources. They adopt this approach because it is easier. In this situation, individuals have some coverage level they feel is adequate, e.g., $50,000, or some amount they can afford. This serves as the underpinning for the life insurance coverage amount decision. Rather than acquiescing to the concept of "just buy some coverage," individuals should seek to review their goals, to review their resources and to deal with the challenges raised by changing factors. Then they should estimate how much life insurance is necessary. When viewed from this perspective the process seems more manageable as shown in Exhibit 9.

Exhibit 9: Ongoing Evaluation Process
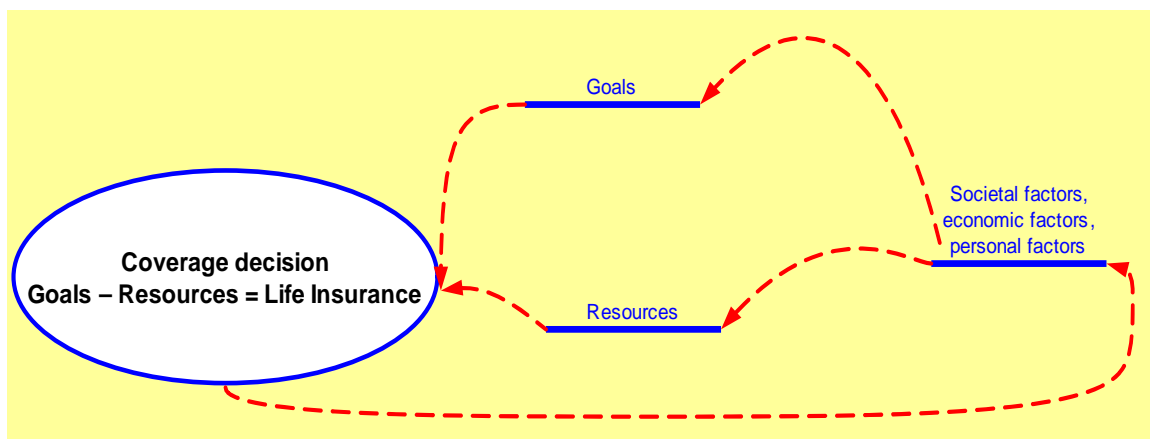
This brings the consumer to the ultimate question, "How much insurance should be purchased?" The answer is "The amount of coverage needed is not constant." It varies over time. It can vary significantly in a very short period. It is always equal to the difference between an individual's goals and an individual's resources. The type of life insurance to purchase will depend on the length of time that a goal will exist and the cost of insuring that goal. While models may include many of the concepts in this paper, it should be noted that an individual should always rely on their own analysis. The key to determining the amount of insurance is continually reviewing goals and resources. By doing this, a consumer reduces the impact of changes in societal, economic and personal factors.

A FINANCIAL EXAMPLE

ESTABLISHING GOALS

To understand the concepts that have been discussed, an example is presented. This example is based on the assumption that an individual re-examines his or her goals at least every twelve months. This simplifies the calculation of how much life insurance is needed, and more importantly, helps to ensure that the right amount of life insurance coverage is maintained.

Assume that the couple we have been discussing, the Roberts, has decided to purchase life insurance. In order to ascertain how much coverage each person needs, it is important to follow the process that has been discussed earlier. The Roberts need to determine their goals. It is often helpful, to examine your environment in order to set goals. The following (limited) information about the Roberts' environment is provided.

Personal Information:
Martha Roberts
- is a CPA,
- works for a small privately owned accounting firm,
- has a defined contribution retirement plan valued at $21,000—it is 50 percent vested,
- expects her income to grow at a 10 percent compound growth rate,
- has $30,000 in term life insurance which is provided by her employer, and
- owns a Tahoe,

Edward Roberts
- is a part owner in a startup company—the book value of his investment is $50,000,
- borrowed the money to invest in the business—he still owes $37,000 to the bank,
- has a Simplified Employee Pension Plan, commonly known as a SEP-IRA with a current value of $11,000—it is fully vested,
- has no life insurance, and
- owns a Honda.

In addition, the Roberts have $27,000 dollars in a joint stock account, with right of survivorship. The Roberts' financial condition is summarized in the balance sheet shown in Exhibit 10. Given their current income stream, they have no difficulty meeting their financial obligations.

Exhibit 10: Balance Sheet for Martha and Edward Roberts*

Assets		Liabilities	
Cash	$2,900.00	Car Loan Honda	$16,000.00
Honda	21,000.00	Car Loan Tahoe	28,000.00
Tahoe	25,000.00	Mortgage	267,000.00
House	267,000.00	Personal Loan for Business	37,000.00
Martha's Retirement	21,000.00		
Edward's SEP	11,000.00		
Personal Property	15,000.00		
Stock Account	27,000.00		
Equity in Business	50,000.00	Net Worth	$91,900.00
	$439,900.00		$439,900.00

*Martha's retirement is shown as $21,000, but only 50 percent of it is vested. The couple obtained a mortgage that required no down payment.

Martha Roberts is expecting their first child, a daughter, in two months. She anticipates being out of work for six to eight weeks and then plans to return to work on a full time basis.

Let's focus on Martha. She decides that she has three goals. Her goals are

- Provide adequate funds for her funeral,
- Provide adequate funds to see that her child is able to obtain an undergraduate degree, and
- Provide adequate funds to replace her income for three years.

DETERMINING THE AMOUNT OF COVERAGE

Let us examine each of these goals and the amount that will be needed to meet each goal. The first goal is relatively easily to calculate. Martha can look at the average cost of a funeral where she lives or actually price the type of service she would like to have. After evaluating the cost of a funeral, Martha ascertains that it will cost $15,000 for her funeral. If Martha wants to be very conservative, she could increase the funeral expense estimate for inflation. However, since she will be re-evaluating her goals every year, and in turn, the amount of life insurance she needs, it probably is not necessary to adjust the funeral cost for inflation.

The second goal is to provide a college fund for her daughter. Martha checks with the flagship public university in her state and learns that tuition, room and books are $15,000 per year. Martha has researched the annual increase rate for the cost for a public institution educational experience and believes that educational costs will increase at the rate of 8 percent per year for the foreseeable future. Martha also believes that her husband could earn an average rate of 5 percent on her life insurance proceeds. Thus, Martha needs life insurance that will pay $15,000 adjusted for inflation at the beginning of each year for four years—the first payment starting when her daughter is 18— discounted for the interest that can be earned on the funds until the daughter needs the first payment. (This is a simplifying assumption. A more refined approach would assume that the daughter would not need the funds at the beginning of each year, but rather would need them spread out over the year. Refining the assumption would have a minor impact on the calculation.)

The amount of funds needed for the daughter's college education is calculated in Exhibit 11. The amount in column "D" for each row is equal to the initial $15,000 compounded at 8 percent and discounted at 5 percent.

Exhibit 11: College Funds Calculation*

Amount of Current Tuition Cost (A)	Factor to Increase the Cost for Inflation (B)**	Factor to Discount the Cost for Interest Income (C)***	Amount Needed for Each Year Starting When the Daughter is 18 (D) (A*B*C)
$15,000.00	3.996	.416	$24,906.00
$15,000.00	4.316	.396	$25,618.00
$15,000.00	4.661	.377	$26,350.00
$15,000.00	5.034	.359	$27,103.00
Total Needed			$103,977.00

*Assumes all adjustments are made at the end of each year.

** "B" is calculated by compounding 1.08 for the number of years until the funds will be needed. For example, 3.996 is 1.08 compounded for 18 years, i.e., 1.08^{18}, the first time the daughter will need funds for college; 4.316 is (1.08^{19}), etc.

*** "C" is calculated by compounding 1.05 for the number of years until the funds will be needed and dividing the results into one. This produces a discount factor. For example, 1.05 compounded for 18 years and divided into one, i.e., $1/(1.05^{18})$, is .416; .396 is $1/(1.05^{19})$, etc.

Based on Exhibit 11, Martha will need $103,977 in life insurance to pay for her daughter's education.

Martha's final goal is to replace her income for the three years following her death. She believes that her husband will need the funds since he is involved in a start up company and his salary probably will not increase over the next three years. There are several factors that need to be considered. Two examples are provided. First, since Martha pays taxes and uses some of her income for her personal needs, she may not need to buy coverage equal to her full salary. Instead, she may only want to purchase an amount equal to a percentage of her salary, e.g., half of her salary. Second, Martha can assume her salary will be constant over the next three years or she can assume that she will get an annual salary increase. As stated earlier, Martha believes her salary will increase 10 percent per year. This growth needs to be included in any calculation she makes.

Exhibit 12 shows how much will be needed to replace Martha's salary. The exhibit is based on the assumption that Martha only needs coverage equal to half of her salary, that she will receive 10 percent pay raises each year for the next three years, and that her husband can earn 5 percent on any life insurance proceeds.

Exhibit 12: Martha's Salary*

Amount of Martha's Salary (A)	Factor to Increase the Cost for Inflation (B)**	Factor to Discount the Cost for Interest Income (C)***	Amount Needed to Cover Loss of Martha's Salary (D) (A*B*C)
$60,000.00	1.100	.952	$62,832.00
$60,000.00	1.210	.907	$65848.00
$60,000.00	1.331	.864	$68999.00
Total Needed			$197,679.00

*Assumes all adjustments are made at the end of each year.

** "B" is calculated by compounding 1.10 for the number of years until the funds will be needed. For example, 1.10 is 1.10 compounded for 1 year, i.e., 1.10^1, the first time Edward will get a payment.

*** "C" is calculated by compounding 1.05 for the number of years until the funds will be needed and dividing the results into one. This produces a discount factor. For example, 1.05 compounded for 1 year and divided into one, i.e., $1/(1.05^1)$, is .952.

Based on Martha's goals she needs the following amount of life insurance without adjusting for existing life insurance or liquid assets is:

Burial	$ 15,000
Daughter's education	103,977
Income for husband	197,679
Total	$ 316,656

Reducing this amount for the $30,000 in coverage that Martha currently has produces $286,656. This amount could be further reduced by the couples liquid assets like Martha's retirement benefit and the stock. If this were done she would only need $249,156 dollars of coverage ($286,656-$27,000-$10,500). Since insurers do not sell partial coverage amounts, Martha will have to purchase $250,000 of coverage.

CONCLUSION

As mentioned earlier, it is important when using a goals approach to reevaluate the goals at least once each year. The reason is that changes in circumstances can dramatically alter the goals and in turn, the amount of coverage that is needed. If Martha anticipated that her income would increase 20 percent per year, instead of 10 percent, because she would become a partner, the coverage for her salary in her example would have to be increased $38,822. Or, if Martha's husband's salary was going to increase rapidly and she did not feel she had to buy life insurance coverage for her salary, her life insurance protection could be reduced $197,679. Thus, this segment of financial planning is an ongoing process that always needs to be reviewed.

APPENDIX – LIFE INSURANCE

THE ROLE OF LIFE INSURANCE

Life insurance is a significant economic asset that maximizes family and societal welfare by providing protection to families in the event of the death of a family member, typically a wage-earner or earners. In "Facts About Life 2005," LIMRA International reports that although the majority of Americans believe life insurance is the best way to protect families against the untimely death of a wage earner, 22 percent of all households (24 million) do not have life insurance protection. Of those households that do have life insurance, 40 percent feel that the amount they have is inadequate. The average insured

household has enough coverage to replace lost income for 3.6 years, but would like to have enough to replace income for 5.7 years. This translates into an additional $200,000 in insurance for each household. LIMRA International further reports that 44 percent of all U.S. households either do not own life insurance or feel they need to purchase more. In addition, one in four U.S. households report they will buy life insurance in the next twelve months while LIMRA reports only 1 in 10 households actually purchase life insurance in any given year (LIMRA International's *Life Insurance Ownership Study*.) LIMRA has found there are four main reasons why underinsured families do not purchase (additional) life insurance. The majority of Americans feel that life insurance is too expensive. Half of the consumers state that it is difficult to determine how much life insurance they need, while the other half admit to simply procrastinating. Twenty percent state that they do not want to think about dying at all. However, 29 percent of all Americans report that they would like to talk about life insurance with an agent or other professional, and one-third report they have never been offered life insurance.

2004 LIFE INSURANCE HOLDINGS

The American Council of Life Insurers (ACLI) reported the total amount of life insurance coverage in force at the end of 2004 was $17.5 trillion dollars, an increase of 3 percent from 2003 (*Life Insurers Fact Book 2005* published by the ACLI.) Three trillion one hundred million dollars of this amount was new life insurance purchased in 2004, a 5 percent increase from 2003.

There are three main types of life insurance policies: policies that are purchased and underwritten on an individual basis (*individual life insurance*), policies that are purchased and underwritten on a group basis (*group life insurance*) and policies purchased to pay off a mortgage or loan in the event of the death of the borrower (*credit life insurance.*) Credit life insurance consists of insurance on loans whose durations are 10 years or less and may be purchased on an individual or group basis. The National Association of Insurance Commissioners (NAIC) classifies insurance on loans whose duration is greater than 10 years as individual or group life insurance (American Council of Life Insurers in the *Life Insurers Fact Book 2005).*

Of all types of life insurance, individual life insurance was the most common type. Nine trillion seven hundred million dollars of individual life insurance was purchased in 2004. Overall, individual life insurance purchases have grown an average of 8 percent per year since 1994. In 2004, the face amount of new individual purchases increased 14 percent

from 2003 to $147,000.   At the same time, the total number of policies purchased actually decreased 9 percent. Of the new polices purchased in 2004, 41 percent were for term policies (70 percent of the face amount issued) and 56 percent were for whole life policies (28 percent of the face amount issued.) Overall, lapse rates are declining. The individual lapse rate for individual coverage was 7.0 percent in 2004—down from 7.6 percent in 2003. The 2004 lapse rate represents the low over the period 1995 to 2004.

Group life insurance comprised 44 percent of all life insurance in force in 2004. Purchases of group life insurance in 2004 increased 5 percent to $1.1 trillion making the total amount of group life in force, $7.6 trillion, a 5 percent increase from 2003. Voluntary termination of these policies generally has been increasing. The termination rate was 9.7 percent in 2004; 9.0 percent in 2003; 9.2 percent in 2002; and, 7.2 percent in 1995.

At the end of 2004, $160 billion of credit life insurance was in force, an increase of 5 percent from 2003.

ABOUT THE AUTHOR

Claude Lilly joined the Belk College faculty in 1997 as the James J. Harris Chair of Risk Management and Insurance and was appointed Dean of the College in 2000. Before coming to UNC Charlotte, he was professor of risk management and insurance and Director of the Center for Risk Management and Insurance Research at Florida State University. Dr. Lilly also was a faculty member and the Director of the Center for Insurance Research at the University of Southern California. His areas of expertise include risk management, insurance company operations, reinsurance, rate making and self-insurance. He has edited several journals, including the Risk Management and Insurance Review, the CPCU Journal, the Journal of Insurance Regulation, and the Journal of Reinsurance. Dr. Lilly earned his PhD at Georgia State University, where he majored in risk management and insurance and minored in international finance. He holds the CPCU and CLU designations and is a member of numerous professional associations.