Income Replacement and Family Needs Analysis

Any method of determining a family’s insurance needs will be an estimate. Future circumstances will change in unexpected ways and basic assumptions about earnings, interest rates, inflation, and similar factors will never replicate actual experience. Consequently, every insurance program must be monitored and periodically updated to assure that the client’s needs are still being met.

Personal computers have made it possible to perform increasingly comprehensive and sophisticated analyses of insurance needs. The problem with this trend is that, as the analyses become more comprehensive and sophisticated, what is already an inherently confusing subject becomes even more so, often further reducing the client’s ability to understand and accept the insurance plan. There is frequently an unfortunate, but necessary, tradeoff between comprehensiveness and comprehension.

Insurance advisers basically use three approaches to estimate family life insurance needs:

* Rules of thumb
* Income replacement approach
* Needs approach

# Rules of Thumb

The simplest methods to understand, and the least reliable, are various rules of thumb that planners frequently use to roughly estimate either the amount of insurance that clients need or the amount of premium clients should be spending on insurance.

One rough guide planners use to estimate the amount of insurance required is six to eight times annual gross income. For instance, based on this rough guide, a parent earning $50,000 per year should have between $300,000 and $400,000 of life insurance. A similar rule that takes immediate cash needs at death into account is five times gross income, plus mortgage, debts, final expenses, and any other special funding need (e.g., college fund).

*Example.* Your client, a parent earns $50,000 per year but also that the mortgage is $60,000, other personal debts are $10,000, final expenses are expected to be $15,000, and that the parent needs $35,000 for the children’s college expenses. Using this rule, the parent would need insurance coverage of about $250,000 (5 x $50,000) plus $120,000 ($60,000 + $10,000 + $15,000 + $35,000), or $370,000 total.

Another rule is that the family should spend about 6 percent of the breadwinner’s gross income plus another 1 percent for each dependent on premiums for life insurance. Under this rule, a person with a nonworking spouse and three children should be spending about 10 percent of gross income on premiums for life insurance. In some cases, the rule may express the amount of premium as a percent, ranging from 5 to 15 percent, of after-tax take-home pay.

Clients may find such rules of thumb useful as a very rough starting point. They can give clients a broad sense of the scope of the problem in terms they can quickly understand. However, these rules are, at best, very limited. Individual needs vary widely and the rules of thumb do not take such variations into account. They do not consider the insured’s age, the dependents’ ages, or whether the family is a one- or two-income household. Stating the objective in terms of required premium outlays is even more limited, because premiums will vary greatly for the same amount of coverage depending on the insured’s age and plan of insurance.

Multiples-of-Salary Method

A somewhat more precise rule-of-thumb method is the use of multiples-of-salary charts such as presented below. This approach is actually a hybrid method combining the simpler rule-of-thumb methods with elements of the income replacement and needs analysis approaches discussed later. The chart is based on the assumption that the average family can live adequately and maintain its standard of living on 75 percent of the wage earner’s after-tax income and that the insured is the only breadwinner in the family. If income were to drop below 60 percent, the family’s living standard would suffer. The chart also assumes social security coverage and that insurance proceeds are invested at a net annual rate of 5 percent.[[1]](#endnote-1)

To use this chart:

1. Find the column showing the spouse’s current age.

2. Locate the point in the column at which the client’s earnings intersect the spouse’s age (the 75 percent column is recommended).

3. Multiply the client’s salary by the appropriate factor.

|  |
| --- |
| MULTIPLES-OF-SALARY CHART |
| **Your****Client’s****PresentGrossEarnings** | **Present Age of Your Client’s Spouse** |
| **25 Years** | **35 Years** | **45 Years** | **55 Years** |
| **75%** | **60%** | **75%** | **60%** | **75%** | **60%** | **75%** | **60%** |
| $7,500 | 4.0 | 3.0 | 5.5 | 4.0 | 7.5 | 5.5 | 6.5 | 4.5 |
| 9,000 | 4.0 | 3.0 | 5.5 | 4.0 | 7.5 | 5.5 | 6.5 | 4.5 |
| 15,000 | 4.5 | 3.0 | 6.5 | 4.5 | 8.0 | 6.0 | 7.0 | 5.5 |
| 23,500 | 6.5 | 4.5 | 8.0 | 5.5 | 8.5 | 6.5 | 7.5 | 5.5 |
| 30,000 | 7.5 | 5.0 | 8.0 | 6.0 | 8.5 | 6.5 | 7.0 | 5.5 |
| 40,000 | 7.5 | 5.0 | 8.0 | 6.0 | 8.0 | 6.0 | 7.0 | 5.0 |
| 65,000 | 7.5 | 5.5 | 7.5 | 6.0 | 7.5 | 6.0 | 6.5 | 5.0 |
| Source: Cady, *Field Guide to Estate Planning, Business Planning & Employee Benefits*, (National Underwriter Company, 2012). |

If the age or earnings differ from those shown in the chart, interpolate using the nearest salaries and ages.

*Example.* A client has a $35,000 salary and a forty-year-old spouse. Since $35,000 is halfway between the $30,000 and $40,000 earnings rows and also halfway between the age thirty-five and age forty-five columns shown in the chart, one would find the multiplier by averaging the four factors shown in these row/column combinations ($30,000 row and age thirty-five column: 8.0; $30,000 row and age forty-five column: 8.5; $40,000 row and age thirty-five column: 8.0; $40,000 row and age forty-five column: 8.0). Therefore, the multiplier is 8.1 [(8.0 + 8.0 + 8.0 + 8.5) ÷ 4]. According to this rule, the estimated amount the family needs to meet its income requirements is $283,500 ($35,000 x 8.1).

In general, one would increase this amount to account for immediate capital or cash needs at death. Such capital needs would commonly include funds to pay funeral and other final expenses, to pay off debts, such as mortgages or personal loans, to fund special projects, such as children’s educations, and to set up an emergency reserve.

*Example.* If your client has a $50,000 mortgage and estimated final expenses of $20,000, wanted $40,000 to fund the children’s educations, and felt that the equivalent of one year’s salary ($35,000) should be set aside for emergencies; the total capital needs would be $145,000. Adding the $145,000 required to fund capital needs to the $283,500 required to fund income needs would result in a total need of $428,500.

Finally, one can determine the amount of additional insurance one needs by subtracting any insurance already in force and the value of other assets that are available for this purpose from the total calculated need.

*Example.* Assume the client already has $150,000 of group insurance provided through his or her employer and has otherwise saved $30,000. One would compute the amount of additional insurance needed by subtracting $180,000 from the estimated total need of $428,500 to derive the final result, $248,500.

The multiples-of-salary chart method still suffers from many of the limitations associated with the simple rules of thumb. It does not take account of the age of the insured, premium costs, or the number of dependents who must be protected. Although it does adjust for the spouse’s age (and implicitly, the number of years for which the surviving spouse needs support), it does not adjust for the ages of children. In addition, it is not a suitable method in the increasingly common case where both spouses work. Similar to the simpler rules of thumb, it does not take into account differences in tax rates or investment rates of return that may apply in different family situations.

However, if these limitations are kept in mind, this method can provide reasonable first approximations of the insurance need in simple situations.

# The Income Replacement Approach

The human life value concept is the basis for a second approach that advisers use to estimate life insurance needs. The human life value concept has often been applied in wrongful death litigation and basically holds that the measure of the economic value of a life to those who depend on that person is the present value of the future earnings potential of that person. The income replacement approach to life insurance needs analysis is based on the premise that the fundamental objective of life insurance is to replace some or all of the earnings lost if an income-producing family member should die. In other words, the insurance coverage should equal the value of that person’s future earnings potential to the surviving family members.

Human Life Value

A person’s human life value depends on numerous factors including future income levels, taxes, education, training, promotions, and various normal decremental factors such as the possibility of illness, disability, periods of unemployment, and the like. However, one usually can compute reasonable estimates of the present value of future earnings using four key inputs or assumptions:

1. Current annual after-tax earnings (C)

2. The projected rate of growth of earnings (g)

3. The future working lifetime (n)

4. An after-tax discount rate (r)

Given these four factors, one computes the present value of future earnings using the present value of an annuity formula, equation 2.1, as follows:[[2]](#endnote-2)

**Equation 2.1**

|  |  |  |  |
| --- | --- | --- | --- |
| PV Future Earnings = C x | 1 – (1 + i)-n | x | 1 + i |
| i | 1 + (*r* ÷ 2) |
| where *i* = | *r – g* | , the growth-adjusted discount rate, and *r* ≠ *g*. |
| 1 + *g* |
| If *r* = *g*, the present value is simply equal to *n* x *C*. |

The formula assumes earnings are paid annually in the middle of the year, which is a reasonable approximation to monthly or other periodic payments throughout the year.

Although one may question the basic premise—because it ignores other equally valid reasons why people may purchase life insurance—the method does allow one to estimate a theoretical maximum consistent with the idea that a person should never be worth more economically to beneficiaries dead than alive. This method may provide a more accurate starting point than simple rules of thumb, while still being relatively easy conceptually—if not computationally—to understand.

*Example.* A thirty-five-year-old client’s after-tax income is currently $50,000 per year, and she estimates that it will grow at an average annual rate of 5 percent and that she will work until age sixty-five. Assume an appropriate after-tax discount rate of 6 percent. The present value of her future earnings is about $1,275,000, computed as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| PV Future Earnings = $50,000 x | 1 – (1.009524)-30 | x | 1.009524 |
| 0.009524 | 1 + (0.06 ÷ 2) |

|  |  |  |  |
| --- | --- | --- | --- |
| = $50,000 x | 1 – 1.75249 | x | 1.009524 |
| 0.009524 | 1.03 |
| = $50,000 x 25.988062 x 0.98012 |
| = $1,273,575 ≈ $1.275 million |

The value of $1,275,000 is the amount that, if invested today at a 6 percent after-tax rate of return, could provide an after-tax income stream payable in the middle of each year for the next thirty years, with the initial after-tax amount starting at $50,000 and each subsequent payment growing by 5 percent. After thirty years, the entire $1,275,000 would be used up.

Basic Assumptions

The present value of future earnings is very sensitive to changes in the underlying earnings growth and discount rate assumptions.

*Example.* Using the facts from the example above, if the client estimates that earnings will grow at 2 percent rather than 5 percent and the discount rate remains at 6 percent, the present value is $881,000, or almost 1/3 less. If instead, one assumes as before that earnings will grow at 5 percent, but the discount rate is only 3 percent, the present value is just over $1,980,000, or more than half again greater.

What are reasonable assumptions for the earnings growth and discount rates?

*Earnings growth rate* – The earnings growth rate usually will depend on inflation rates and tax rates, as well as career opportunities. As a guideline, keep in mind that the average annual compound U.S. growth rate of inflation-adjusted disposable (after-tax) income has been just over 2 percent over the long run. In other words, on average, after-tax incomes have increased by about 2 percent more than inflation each year. Year to year, the rate has varied widely, but for estimation purposes, long-term trends are most appropriate.

Inflation itself has averaged slightly more than 4 percent per year over the period 1977 to 2006, but it too varies widely from year to year or from subperiod to subperiod. For the period from 1977 to 1986, inflation averaged 10.68 percent per year. This is considerably higher than the 3.65 percent average for the period from 1997 to 2006. The recent trend of inflation rates has been down. However, there have been long periods where inflation rates remain quite high.

The 2 percent U.S. average growth in inflation-adjusted disposable earnings is an average across all industries and occupations and all age groups. But it is not necessarily a good estimate of real average annual earnings growth for any particular individual. First, every individual is unique and may advance faster or slower than others within his or her occupation. Second, earnings growth rates vary among industries and occupations. Some occupations or occupations within certain industries experience greater than average earnings increases as computed across all occupations while other occupations are experiencing less than average increases.[[3]](#endnote-3) So estimates of earnings growth rates must take close account of the particular talents and potential of the client and the character of the lifetime earnings profile of his or her chosen occupation.

As a practical matter, estimates of future real inflation-adjusted earnings growth rates are unnecessary in many cases. Many family breadwinners desire to provide a standard of living comparable to that the family currently enjoys if they should die. However, they do not feel quite the same responsibility to insure the increasing standard of living the family might enjoy while they live. If the objective is to maintain the family’s current standard of living, it is only necessary to estimate future inflation rates, not also earnings growth rates in excess of inflation. In these cases, an estimate of the average future inflation rate would be substituted for the earnings growth rate in equation 2-1. The value so calculated is the amount that if invested today at the assumed after-tax rate of return could replace the wage earner’s current level of real inflation-adjusted after-tax income each year for the rest of what would be the wage earner’s remaining working lifetime.

*After-tax discount rates* – Estimating reasonable after-tax discount rates can be just as problematic. The basic question is: At what after-tax rate of return could the life insurance proceeds be invested over the long run? That depends on the risk one is willing to assume, tax rates, and inflation rates. As a guideline, Figure 2.1 presents average nominal and real (inflation-adjusted) compound returns for principal categories of marketable assets and inflation for the World War II period 1946 to 2011.

**Figure 2.1**

|  |
| --- |
| AVERAGE ANNUAL NOMINAL AND REAL COMPOUND RETURNS(1946-2011) |
|  | **Nominal** | **Real** |
| Large Stocks (S&P 500) | 10.59% | 6.45% |
| Corporate Bonds (Moody’s AAA) | 6.00% | 2.03% |
| Government Bonds (10 Year) | 6.03% | 2.06% |
| Treasury Bills (3 Month) | 4.35% | 0.44% |
| Inflation (Consumer Price Index) | 3.89% | NA |
| *Source*: *Ibbotson SBBI 2012 Classic Yearbook*, Morningstar, Inc., Chicago, IL |

Using the post World War II period 1946 to 2011 as a basis for estimating returns, an investment in long-term high-quality corporate bonds could be expected to return about 10.59 percent before tax compounded annually. A 50/50 mix of high quality corporate bonds and common stocks—which is about as aggressive as one would want to assume the assets would be invested—could be expected to return about 8.30 percent. As Figure 2.1 shows, the real annual inflation-adjusted compound return for corporate bonds over this period was just 2.03 percent after adjusting for inflation (which averaged 3.89 percent); for a 50/50 bond/stock mix, about 4.24 percent. Chances are that returns for all asset classes will tend toward the long run average over time, but there is no assurance of when or even if that will actually happen.

Because the present values one computes will vary substantially depending on the assumed rate of return, it is best to discuss alternative assumptions with clients and let them be the guide—within informed reason—on selecting the appropriate discount rate. Because present values vary inversely with the assumed discount rate, the conservative and prudent practice is to err on the side of lower, rather than higher, assumed rates.

To determine the appropriate discount rate, one must adjust whatever estimate of return one starts with for taxes. The tendency is to overstate tax rates because appropriate adjustments for standard deductions and personal exemptions, as well as the tax-free recovery of investment, are neglected. The effect of the standard deduction and personal exemptions may be to reduce the appropriate tax rate for use in equation 2.1 to about 20 percent to 80 percent of the marginal tax bracket rate for a comparable level of adjusted gross income. The effect of the exclusion of amounts treated as a recovery of the initial investment may further reduce the effective average tax rate by 1/3 or more. In general, it is suitable to apply tax rates ranging from about 4 percent to about 10 percent when determining after-tax discount rates to use in equation 2-1.

# Family Support Ratio

Under the income replacement approach, insurance value is always less than human life value. The portion of after-tax income spent for self-maintenance is not available for the family, so only the remaining portion is what is devoted to or spent in support of the family. Advisers often assume that breadwinners spend about 25 percent of after-tax income for self-maintenance and the remaining 75 percent for family support. However, this ratio may vary widely from family to family. In general, the proportion spent in support of the family is somewhat less at higher incomes than at lower incomes and is higher the greater is the number of children. In addition, under the basic premise of this method, one of the important elements of family support is the cost of the insurance itself. Because the amount spent for insurance is not otherwise available to support the family’s standard of living, this cost should further reduce the proportion of income that is insured to support the surviving family members’ standard of living.

Therefore, once one estimates the breadwinner’s human life value, one should multiply that amount by the family support ratio. For example, if the calculations determine that the present value of future earnings is $1 million and one also assumes that the family needs 70 percent of the breadwinner’s after-tax income to support the surviving family members’ standard of living, then the amount needed to maintain the family in the event of the breadwinner’s death is $700,000.

 Other Adjustments

The amount so determined is not necessarily the amount of additional insurance required. Planners should further reduce this amount by the amount of any assets that are currently available to fund the survivor’s income needs and by any life insurance currently in force. Among the assets that planners should count are marketable securities, savings account balances, and the like, as well as current vested account or benefit balances in employer-sponsored pension and profit-sharing plans, Code section 403(a) or (b) tax-deferred annuity plans, Individual Retirement Arrangements (IRAs) and Roth IRAs, Simplified Employee Pensions (SEPs), Keogh plans, and SIMPLE IRAs.

Many advisers feel that the family should also increase the support ratio to account for contributions or credits that the breadwinner would make to employer-sponsored retirement plans (qualified and nonqualified) while the breadwinner lives.

*Example*. Assume the employer sponsors a 401(k) plan that will match 50 percent of employee contributions up to 6 percent of pay. If the employee has 6 percent of pay deducted for the 401(k), the reported after-tax salary is reduced by about 6 percent. However, the 401(k) plan increases by 9 percent of pay. Assuming, for simplicity, that the employee is in the 33 percent tax bracket, this is effectively equivalent to an offsetting 6 percent increase in the employee’s after-tax income. Therefore, planners should compute the family support ratio based upon the reported after-tax income increased by the effective after-tax value of the 401(k) contributions. If one otherwise assumes the family support ratio is 70 percent, one should increase it to 74.2 percent to account for the equivalent after-tax value of the employer-sponsored plan (70% x 6% = 4.2%).

In addition, many advisers strongly suggest that the family should increase the amount by any outstanding debts, such as personal loans and the home mortgage, and by anticipated final death expenses. Although it violates the general premise of the income replacement method (which is to provide a fund sufficient, but no larger than that necessary, to replace what the breadwinner would provide to the family if and while he or she lives), in some cases advisers further recommend that family breadwinners acquire additional insurance to fund special objectives, such as college education funds for the children. In general, many families consider such funding objectives part of their normal support obligation and implicitly include such objectives when selecting the family support ratio.

Adjustment for Social Security Survivor Benefits

Most workers are covered by Social Security or some other government program that provides survivor benefits to surviving spouses with dependent children and surviving spouses alone after age sixty. This is a form of income-replacement insurance and should reduce the present value of the family support obligation accordingly. The amount paid to a surviving spouse with at least one eligible child (under age sixteen or disabled before age twenty-two) is 75 percent of the deceased spouse’s Primary Insurance Amount (PIA) at the date of death. For each eligible child, an additional 75 percent of the PIA is payable. Children are eligible for a child’s benefit until age eighteen, or until age nineteen if in high school, or as long as they are disabled if disability occurs before age twenty-two. A spouse alone is eligible for reduced benefits equal to 71.5 percent of the PIA starting at age sixty, or if receipt of benefits is delayed, up to 100 percent of the PIA starting at normal retirement age.[[4]](#endnote-4) A disabled spouse is eligible for 71.5 percent of the PIA starting at age 50. The total amount payable to the family is subject to a limit, called the maximum family benefit, which can range from 150 percent to about 187.5 percent of the PIA.

The PIA depends on both the level of pay and the number of years in covered employment. An annual Social Security Statement is sent to most participants within three months of their birthdays. This statement provides information regarding a person’s current insurance status in the Social Security program, earnings history, current PIA, and estimates of benefits. Any participant who does not receive the automatic Statement by one month before her month of birth or who needs a Statement sooner than she is scheduled to receive it may request a statement at any time. A person may process the request online or by mailing Form SSA-7004-PC to the Social Security Administration.[[5]](#endnote-5)

Figure 2.2 can be used to estimate survivor benefits. The figures are for 2012 and are based on the assumption that the worker has been employed steadily and received 5 percent pay raises throughout his or her working career. In the case of the $110,100 wages, wages are assumed to be equal to or greater than the maximum OASDI wage base for all years. Normal retirement age depends on when a person was born. Like other Social Security benefits, survivor benefits are increased each year to reflect changes in the cost of living. Therefore, readers may use the table to estimate benefits in 2012 and later years by scaling the appropriate figures up by the rate of increase in the CPI since 2012.

**Figure 2.2**

|  |  |
| --- | --- |
| APPROXIMATE MONTHLY SURVIVORS’ BENEFITS FOR YOUR FAMILYASSUMING STEADY EARNINGS AND DEATH IN 2012 |  |
|  | **Earnings in 2012** |
| **Age**7 | **Family** | **$30,000**1 | **$45,000**1 | **$60,000**1 | **$75,000**1 | **$90,000**1 | **$105,000**1 | **$110,100 or More**2 |
| 35 | Your spouse and one child3 | $1,742 | $2,280 | $2,816 | $3,104 | $3,358 | 3,608 | 3,876 |
|  | Your spouse and two children4 | 1,964 | 2,794 | 3,288 | 3,624 | 3,918 | 4,212 | 4,523 |
|  | One child only | 871 | 1,140 | 1,408 | 1,552 | 1,679 | 1,804 | 1,938 |
|  | Your spouse at NRA5 | 1,161 | 1,520 | 1,878 | 2,070 | 2,238 | 2,406 | 2,584 |
|  | Your spouse at age 606 | 830 | 1,087 | 1,343 | 1,480 | 1,600 | 1,720 | 1,848 |
| 45 | Your spouse and one child3 | 1,636 | 2,122 | 2,608 | 2,984 | 3,212 | 3,438 | 3,814 |
|  | Your spouse and two children4 | 1,774 | 2,654 | 3,088 | 3,482 | 3,748 | 4,013 | 4,451 |
|  | One child only | 818 | 1,061 | 1,304 | 1,492 | 1,606 | 1,719 | 1,907 |
|  | Your spouse at NRA5 | 1,091 | 1,415 | 1,739 | 1,989 | 2,141 | 2,293 | 2,542 |
|  | Your spouse at age 606 | 780 | 1,012 | 1,244 | 1,422 | 1,531 | 1,639 | 1,818 |
| 55 | Your spouse and one child3 | 1,554 | 1,998 | 2,444 | 2,886 | 3,096 | 3,302 | 3,776 |
|  | Your spouse and two children4 | 1,625 | 2,430 | 2,941 | 3,369 | 3,613 | 3,855 | 4,407 |
|  | One child only | 777 | 999 | 1,222 | 1,443 | 1,548 | 1,651 | 1,888 |
|  | Your spouse at NRA5 | 1,037 | 1,333 | 1,629 | 1,924 | 2,064 | 2,202 | 2,517 |
|  | Your spouse at age 606 | 741 | 953 | 1,165 | 1,376 | 1,476 | 1,574 | 1800 |
| 1. Assumes earnings increased at 5 percent annual growth rate from age 22 through 2012. |
| 2. Assumes earnings equal to or greater than the OASDI wage base from age 22 through 2012. |
| 3. Amounts shown also equal to the benefits paid to two children, if no parent survives or surviving parent has substantial earnings. |
| 4. Equals the maximum family benefit. |
| 5. Normal retirement age (66 to 67) depends on year of birth. Amounts payable in 2012. Spouses reaching NRA in the future would receive higher benefits. |
| 6. Amounts payable in 2012. Spouses turning 60 in the future would receive higher benefits. |
| 7. Spouse is assumed to be the same age as the insured. |
| Note: The accuracy of these estimates depends on actual earnings, which may vary significantly from those shown here. |

*Example.* Your client, Mike Fox, is married and is currently earning $60,000 in FICA wages, is age forty-five. His wife, Mary, is also age forty-five and they have two children, ages nine and five. According to Figure 2.2, Mary and each of Mike’s two children are eligible for survivor benefits of $1,304 per month, or $3,912 total in 2012 dollars. However, the maximum monthly family benefit is $3,088 in 2012 dollars. The annual benefit of $37,056 (12 x $3,088) would be payable for nine years until Mike’s nine-year-old turns age eighteen (or nineteen if the child is still in high school). (All benefits would increase each year for inflation.) After that, $31,296 (12 x $1,304 x 2: the maximum family benefit limit is higher at this point and no longer applies) would be payable for two years until Mike’s second child reaches age sixteen. At this point, Mary’s benefit payments would cease until she reaches age sixty. Mike’s second child would continue to receive a child’s benefit of $15,648 (12 x $1,304 x 1) for two more years until age eighteen (or nineteen if a full time high school student).

When Mary reaches age sixty, she will be eligible for $1,244 per month (in 2012 dollars) for life, or if she waits until age sixty-seven (her normal retirement age) to begin receiving payments, $1,739 (in 2012 dollars). Of course, Mary’s benefits must also be adjusted for anticipated increases due to inflation until benefits begin. The mechanics of this adjustment are explained in the following section.

Converting Social Security Survivor Benefits to Present Values

To account for these Social Security benefits when determining the amount of insurance required, one must convert the Social Security benefits into a present value using equation 2.1. Using the prior example to demonstrate the procedure, the benefits payable during the children’s eligibility period are best viewed in three components:[[6]](#endnote-6)

1. a stream of $15,648 (12 x $1,304 in 2012 dollars) annual payments for thirteen years (the youngest child’s benefit until reaching age eighteen); and

2. a stream of $15,648 (12 x $1,304 in 2012 dollars) payable for eleven years (Mary’s benefit until the youngest child reaches age sixteen); and

3. a stream of $5,760 ($37,056 Maximum Family Benefit - $31,296 [$15,648 x 2: Mary’s and youngest child’s benefits] in 2012 dollars) payable for nine years (the incremental benefit payable to the oldest child as limited by the maximum family benefit).

Assuming benefits continue to inflate at a 3 percent rate each year and that 6 percent is a reasonable interest rate assumption, equation 2-1 would be used to determine the present values as follows:

|  |  |  |
| --- | --- | --- |
| i = | 0.06 – 0.03 | = 0.02913 |
| 1.03 |

|  |  |  |  |
| --- | --- | --- | --- |
| PV Benefit Stream (1) = $15,648 x | 1 – (1.02913)-13 | x | 1.02913 |
| 0.02913 | 1 + (0.06 ÷ 2) |
| = $15,648 x 10.69437 x 0.999155 = $167,204 |
|  |
| PV Benefit Stream (2) = $15,648 x | 1 – (1.02913)-11 | x | 1.02913 |
| 0.02913 | 1 + (0.06 ÷ 2) |
| = $15,648 x 9.29737 x 0.999155 = $145,362 |
|  |
| PV Benefit Stream (3) = $5,760 x | 1 – (1.02913)-9 | x | 1.02913 |
| 0.02913 | 1 + (0.06 ÷ 2) |
| = $5,760 x 7.81779 x 0.999155 = $44,992 |
| PV Streams (1) + (2) + (3) = $167,204 + $145,362 + $44,992 = $357,558 |

The present value of Social Security benefits payable to the spouse, Mary in this case, is determined in a similar manner, except that the present value must be adjusted for the fact benefits will not be paid until Mary reaches at least age sixty.[[7]](#endnote-7) This can be accomplished in several ways, but the easiest method is to use a two-step procedure where one first calculates the present value as if the payments were to begin today and then discounts this value at the assumed inflation-adjusted rate of return for the number of years until payments would actually begin. The formula for finding the present value of a future lump sum value of the spouse’s benefits is:

**Equation 2.2**

|  |  |  |
| --- | --- | --- |
| Present Value of Future Lump Sum (FLS) = FLS x | 1 |  n |
| 1 + i |  |

where i is computed using the assumed before-tax discount rate. The before-tax discount rate is used because Social Security benefits generally are paid free of income tax.[[8]](#endnote-8)

**Figure 2.3**

|  |
| --- |
| TABLE VONE LIFE-EXPECTED RETURN MULTIPLES |
| **Age** | **Multiples****(Life Expectancy)** | **Age** | **Multiples****(Life Expectancy)** | **Age** | **Multiples****(Life Expectancy)** |
| 5 | 76.6 | 42 | 40.6 | 79 | 10.0 |
| 6 | 75.6 | 43 | 39.6 | 80 | 9.5 |
| 7 | 74.7 | 44 | 38.7 | 81 | 8.9 |
| 8 | 73.7 | 45 | 37.7 | 82 | 8.4 |
| 9 | 72.7 | 46 | 36.8 | 83 | 7.9 |
| 10 | 71.7 | 47 | 35.9 | 84 | 7.4 |
| 11 | 70.7 | 48 | 34.9 | 85 | 6.9 |
| 12 | 69.7 | 49 | 34.0 | 86 | 6.5 |
| 13 | 68.8 | 50 | 33.1 | 87 | 6.1 |
| 14 | 67.8 | 51 | 32.2 | 88 | 5.7 |
| 15 | 66.8 | 52 | 31.3 | 89 | 5.3 |
| 16 | 65.8 | 53 | 30.4 | 90 | 5.0 |
| 17 | 64.8 | 54 | 29.5 | 91 | 4.7 |
| 18 | 63.9 | 55 | 28.6 | 92 | 4.4 |
| 19 | 62.9 | 56 | 27.7 | 93 | 4.1 |
| 20 | 61.9 | 57 | 26.8 | 94 | 3.9 |
| 21 | 60.9 | 58 | 25.9 | 95 | 3.7 |
| 22 | 59.9 | 59 | 25.0 | 96 | 3.4 |
| 23 | 59.0 | 60 | 24.2 | 97 | 3.2 |
| 24 | 58.0 | 61 | 23.3 | 98 | 3.0 |
| 25 | 57.0 | 62 | 22.5 | 99 | 2.8 |
| 26 | 56.0 | 63 | 21.6 | 100 | 2.7 |
| 27 | 55.1 | 64 | 20.8 | 101 | 2.5 |
| 28 | 54.1 | 65 | 20.0 | 102 | 2.3 |
| 29 | 53.1 | 66 | 19.2 | 103 | 2.1 |
| 30 | 52.2 | 67 | 18.4 | 104 | 1.9 |
| 31 | 51.2 | 68 | 17.6 | 105 | 1.8 |
| 32 | 50.2 | 69 | 16.8 | 106 | 1.6 |
| 33 | 49.3 | 70 | 16.0 | 107 | 1.4 |
| 34 | 48.3 | 71 | 15.6 | 108 | 1.3 |
| 35 | 47.3 | 72 | 14.6 | 109 | 1.1 |
| 36 | 46.4 | 73 | 13.9 | 110 | 1.0 |
| 37 | 45.4 | 74 | 13.2 | 111 | .9 |
| 38 | 44.4 | 75 | 12.5 | 112 | .8 |
| 39 | 43.5 | 76 | 11.9 | 113 | .7 |
| 40 | 42.5 | 77 | 11.2 | 114 | .6 |
| 41 | 41.5 | 78 | 10.6 | 115 | .5 |

Equation 2-1 can be used in the first-step calculation to determine the lump sum value of the benefit stream payable to Mary, assuming that Mary were currently age sixty (or at normal retirement age, depending on which age benefits are assumed to start). The term of the payment period should be Mary’s life expectancy at the age payments are assumed to begin. Based on IRS Table V (see Figure 2.3),[[9]](#endnote-9) life expectancy for a sixty-year-old is 24.2 years. Of course, adjustments should probably be made for any known health problems, the family history of longevity, and the fact that females still tend to live longer than males, although the gap is narrowing slightly.[[10]](#endnote-10) Assuming payments will begin at Mary’s age sixty, her monthly payments will be $1,244, or $14,928 annually. If the appropriate life expectancy is 24.2 years, the discount rate is 6 percent, and the inflation rate is 3 percent (that is, i = 0.02913), the future lump sum value of Mary’s benefit stream when she is age sixty using 2012 dollars is:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Future Lump Sum Value | = $14,928 x | 1 - (1.02913)-24.2) | x | 1.02913 |
| Spouse’s Benefit Age 60 | 0.02913 | 1 + 0.06/2 |

Future Lump Sum Value Spouse’s Benefit Age 60 = $14,928 x 17.19404 x 0.999155 = $256,456

Equation 2-2 is now applied to complete the second step of the calculation. In this case, Mary is currently age forty-five, so the future Social Security benefits will begin in fifteen years at age sixty. The present value of the future lump sum value of Mary’s benefits is computed as follows:

|  |  |  |
| --- | --- | --- |
| Present Value of Future Lump Sum (FLS) = $256,456 x | 1 | 15 |
| 1.02913 |  |

= $256,456 x 0.65005 = $166,709

The present values of all Social Security benefits to the family are summed to determine the current insurance value of the Social Security benefits. In this case, the present value of the Social Security benefits payable to Mary and the children while the children are young is approximately $360,000, and payable to Mary upon reaching age sixty is approximately $167,000, for a total of about $527,000. The present value of the family support obligation otherwise determined should then be reduced by this amount in deriving the required amount of insurance.

1. The table was developed by the staff of First National Bank (Citibank). [↑](#endnote-ref-1)
2. The first part of equation 2-1 is the standard formula for the present value of an annuity with payments at the end of each period (year). The second part of the equation is an adjustment factor to move the payments to the middle of each period (year) rather than the end. The value can be computed easily using a financial calculator. [↑](#endnote-ref-2)
3. National or industry occupational averages may be misleading when trying to estimate earnings growth for a particular occupation for another reason. In many occupations, especially in the professions and in executive or managerial positions, the normal lifetime profile of any average individual’s earnings growth may show greater real growth than the average increase for that occupation as a whole. [↑](#endnote-ref-3)
4. [↑](#endnote-ref-4)
5. One can download Form SSA-7004 at www.ssa.gov/online/ssa-7004.pdf and file the completed form by mailing it to:

|  |
| --- |
|  Social Security Administration Wilkes Barre Data Operations Center P.O. Box 7004 Wilkes Barre, PA 18767-7004 |

 An excellent and concise source of information on Social Security benefits is *Social Security & Medicare Facts*, The National Underwriter Company, published annually. [↑](#endnote-ref-5)
6. Where the maximum family benefit applies, individual social security benefits are generally reduced proportionately. The three categories here are not shown proportionately in order to facilitate calculation of the present value of the total benefits. [↑](#endnote-ref-6)
7. The question of whether a surviving spouse should begin taking Social Security benefits at age sixty or later depends on a number of factors. There is a trade-off. Although if payments are started at age sixty, they will be paid longer, the amount is reduced. In general, it is optimal for a normal healthy surviving spouse to begin taking benefits at age sixty, rather than delaying the start to normal retirement age, even though payments are lower, if the appropriate inflation-adjusted discount rate for those future payments is above 3 percent. If the discount rate is below 3 percent, the spouse will be better off waiting to take payments. For a comprehensive discussion of the factors involved in this decision, see “When to Take Early Social Security Benefits,” Robert J. Doyle, Jr., *The Journal of the American Society of CLU & ChFC*, Vol. XLIV, No. 1 (January, 1990), pp. 30-37. [↑](#endnote-ref-7)
8. Up to 85 percent of Social Security benefits are taxable under current law if modified taxable income – defined basically as normal taxable income plus tax-exempt bond interest income plus 50 percent of Social Security income – exceeds $34,000 for single [↑](#endnote-ref-8)
9. [↑](#endnote-ref-9)
10. [↑](#endnote-ref-10)