Chapter 18
Life Insurance Purchase Decisions

■ Overview

Would you purchase a major appliance, new home, or a new car without shopping around first? Many of the same consumers who would answer this question “of course not” purchase life insurance without considering the true cost of the coverage. Even though life insurers are pricing the same risk, there are significant variations in the cost of life insurance. In addition to cost, there are a number of other important considerations in purchasing life insurance. This chapter discusses the fundamentals of life insurance purchasing. Major topics covered include: methods of determining the cost of life insurance, methods of determining the rate of return on the cash value, taxation of life insurance, and suggestions to follow when purchasing life insurance. The appendix at the end of the chapter explains how life insurance premiums are calculated. A problem set is included with the usual exercises.

■ Learning Objectives

After studying this chapter, you should be able to:

- Explain the defects in the traditional net cost method for determining the cost of life insurance.
- Explain the interest-adjusted surrender cost index and net payment cost index for determining the cost of life insurance.
- Explain the yearly-rate-of-return method for determining the annual rate of return on the savings component in a life insurance policy.
- Describe the suggestions to follow when purchasing life insurance.
- Understand how life insurance premiums are calculated. (covered in the chapter appendix)
- Define the following:
  - Certified Financial Planner (CFP)
  - Chartered Financial Consultant (ChFC)
  - Chartered Life Underwriter (CLU)
  - Interest-adjusted cost method
  - Linton yield
  - Low-load life insurance
  - Net payment cost index
  - Surrender cost index
  - Traditional net cost method
  - Yearly rate-of-return method
Outline

I. Determining the Cost of Life Insurance
   A. Traditional Net Cost Method
   B. Interest-Adjusted Cost Method
      1. Surrender Cost Index
      2. Net Payment Cost Index
   C. Substantial Cost Variation Among Insurers
   D. Using Interest-Adjusted Cost Data
   E. NAIC Policy Illustration Model Regulation

II. Rate of Return on Saving Component
   A. Linton Yield
   B. Yearly Rate-of-Return Method

III. Taxation of Life Insurance
   A. Federal Income Tax
   B. Federal Estate Tax

IV. Shopping for Life Insurance
   A. Determine Whether You Need Life Insurance
   B. Estimate the Amount of Life Insurance You Need
   C. Decide on the Best Type of Life Insurance for You
   D. Decide Whether You Want a Policy That Pays Dividends
   E. Shop Around for a Low-Cost Policy
   F. Consider the Financial Strength of the Insurer
   G. Deal with a Competent Agent

Short Answer Questions

1. Why is it incorrect to simply compare the premiums for cash value life insurance policies when comparing the cost of coverage?
2. What are the major defects of the traditional net cost method?

3. How do the surrender cost index and net payment cost index correct some of the defects inherent in the traditional net cost method?

4. In calculating the surrender cost and net payment cost, why is the future value annuity due factor used rather than the future value ordinary annuity factor?
5. Where can a consumer who is interested in comparing interest-adjusted cost data obtain the necessary information?

6. Is it enough to use interest-adjusted cost data in isolation to select a life insurance policy, or should additional factors be considered? If additional factors should be considered, identify the factors.

7. In addition to the financial strength of the present insurer, what other factors should be considered in determining whether to replace a life insurance policy?

8. What is the Linton yield?
9. How is the yearly rate of return calculated in the method developed by Professor Joseph Belth?

10. What income tax advantages are associated with life insurance?

11. To determine if federal estate taxes are payable upon death, the gross estate must first be calculated. How is the value of the gross estate determined?
12. What suggestions do consumer experts offer regarding shopping for life insurance?

**Multiple Choice Questions**

*Circle the letter that corresponds to the BEST answer.*

1. Which of the following provides the most meaningful cost index (dollars and cents per thousand per year) of cash value life insurance?
   (a) traditional net cost
   (b) Linton yield
   (c) surrender cost index
   (d) human life value

2. Which statement(s) is(are) true with respect to the traditional net cost method of calculating the cost of life insurance?
   I. It ignores the time value of money.
   II. Life insurance is often shown to be free.
   (a) I only
   (b) II only
   (c) both I and II
   (d) neither I nor II

3. All of the following should be considered when determining whether to replace a life insurance policy EXCEPT:
   (a) the incontestable clause
   (b) the cost of “getting out of” your present coverage
   (c) the grace period
   (d) tax considerations
4. Karen is concerned about the rate of return she will earn on a cash value life insurance policy. To analyze the rate of return, she divided each premium into two components: cost of insurance coverage and savings. Then she calculated the average annual rate of return that would be needed to transform the annual savings contributions into the guaranteed cash value at a specified time. Karen calculated the:
   (a) net payment cost
   (b) Linton yield
   (c) yearly rate of return using the Belth method
   (d) surrender cost

5. Which statement is true with regard to the yearly rate of return method developed by Belth?
   (a) It ignores dividend payments.
   (b) It calculates a cost per thousand per year.
   (c) It ignores the increase in cash value from year to year.
   (d) It uses an assumed price per thousand dollars of coverage.

6. Which statement(s) is(are) true with regard to the surrender cost index?
   I. It is based upon the assumption that the policy will be surrendered after a specified period.
   II. It ignores the time value of money.
   (a) I only
   (b) II only
   (c) both I and II
   (d) neither I nor II

7. Which of the following statements is true with regard to shopping for life insurance?
   (a) You can use the surrender cost index to determine how much coverage to purchase.
   (b) The financial strength of the insurer writing the coverage is unimportant.
   (c) The financial ratings assigned to life insurers are sometimes unreliable and confusing.
   (d) You can use the needs approach to determine the cost of life insurance per thousand per year.

8. Nathan is interested in analyzing the cost of life insurance. He wants to perform the analysis based on the assumption that the life insurance coverage will remain in force. Which of the following techniques would be most appropriate for Nathan to use?
   (a) net payment cost index
   (b) traditional net cost
   (c) Linton yield
   (d) surrender cost index

9. Which statement(s) is(are) true with regard to the Linton yield technique?
   I. It determines a cost per thousand dollars of life insurance per year.
   II. It requires dividing the premium into two components: the cost of insurance protection and savings.
   (a) I only
   (b) II only
   (c) both I and II
   (d) neither I nor II
10. All of the following statements about the tax treatment of life insurance are true EXCEPT:
   (a) While a cash value policy is in force, the cash value accumulates tax-free.
   (b) Policyowners are required to pay taxes on policyowner dividends.
   (c) Lump-sum death benefits are received tax-free.
   (d) If life insurance proceeds are paid through an annuity, the portion of the annuity payment that
       represents interest is taxable income.

11. The gross estate can be reduced by the value of property passed to a surviving spouse. This reduction
    is know as:
    (a) the unified tax credit
    (b) the marital deduction
    (c) the absolute assignment
    (d) the homestead exemption

12. The best life insurance for you to purchase is:
    (a) the policy with the highest surrender cost index
    (b) the policy that pays the highest dividends
    (c) the policy that has the highest Linton yield
    (d) the policy that best fits your needs

**True/False**

Circle T if the statement is true or F if the statement is false. Explain to yourself why the statement
is false.

T  F   1. When shopping for cash value life insurance, you can simply compare premiums to determine
     which policy is best.

T  F   2. Since all life insurance companies are determining rates for the same risk, death, there is little
     variation in cost among similar life insurance contracts.

T  F   3. The interest-adjusted methods ignore the timing and magnitude of dividend payments.

T  F   4. The cost comparison techniques should be used to compare similar plans of insurance.

T  F   5. A life insurance policy that pays dividends to the policyowner is known as a participating life
     insurance policy.

T  F   6. The future value ordinary annuity factor is used to calculate the future value of the premiums
     when the interest-adjusted methods are employed.

T  F   7. For a cash value life insurance policy in force long enough to have a cash value, the surrender
     cost per thousand per year will always be greater than the net payment cost per thousand per
     year.

T  F   8. Belth’s yearly rate of return method can only be used for participating life insurance policies.
T  F  9. If the insured has any incidents of ownership in a life insurance policy when he or she dies, the entire proceeds are included in his or her gross estate for federal estate tax purposes.

T  F  10. It is wise to shop around when purchasing life insurance.

T  F  11. The financial strength of the company issuing the life insurance contract should be taken into consideration by a prospective purchaser.

T  F  12. Low-load life insurance is characterized by low marketing expenses.

Problems

1. Andy is considering the purchase of a $20,000 whole life policy. The coverage will have an annual premium of $248.60. The coverage is participating, and based on the insurer’s history with similar policies, it is estimated the company will pay a total of $814 in dividends over the first twenty years. If these dividends are invested at 5 percent interest, the dividends would accumulate to $1163 after 20 years. The cash value after 20 years will be $4314.20. For calculations involving the time value of money, 5 percent is the appropriate interest rate.
   (a) What is the traditional net cost per thousand per year?

   (b) What is the surrender cost per thousand per year?
(e) What is the net payment cost per thousand per year?

2. The appendix at the end of Chapter 18 covers life insurance pricing. Using the mortality data provided in Exhibit A1 and the present value factors provided in Exhibit A2, determine the following premiums.
   (a) What is net single premium per thousand for a one-year term policy issued to man age 30, assuming a 5.5 percent interest rate?

   (b) What is the net single premium per thousand for a three-year term policy issued to a man age 38, assuming a 5.5 percent interest rate?
Case Applications

Case 1
Jenny wants to purchase life insurance coverage. She calculated how much life insurance she needs and what type of policy to purchase, and she found a low-cost policy. Her final question to the agent was, “Tell me about the financial strength of your company.” The agent replied, “I represent an A-rated company.” What follow-up question should Jenny ask?

Case 2
John Johnson is the president of Easy Pay Life Insurance Company. A life insurance rating service just published a list of surrender cost indexes for life insurance policies. Easy Pay’s most popular product, The Easy Pay Wealth Accumulator Policy, ranked low on the list. John was bothered by the low rating, but he had an idea. He issued a press release noting that from now on, a “persistency bonus” in the form of an addition to the cash value, would be paid on each ten-year anniversary of the purchase of the Wealth Accumulator Policy. In announcing the persistency bonus, John said the bonus was “designed to recognize and reward our long-term policyowners.” Is John just being generous, or might he have another motive? Explain.
Solutions to Chapter 18

Short Answer Questions

1. To properly consider the cost of coverage, you must also consider what you receive in exchange for the premiums paid. A policy with lower premiums may also provide a lower cash value after a specified period and may not pay dividends. To obtain a clear picture, you should not only consider what you pay, but also what you receive in exchange for the premium.

2. The major defects of the traditional net cost method include: the time value of money is ignored, insurance is often shown to be free, the steepness of the dividend scale is ignored, the dividend scale is assumed to remain unchanged, and the traditional net cost method is based upon the assumption that the policy will be surrendered.

3. These interest-adjusted techniques take into consideration the time value of money and the steepness of the dividend scale. Rather than considering interest with respect to the cash value only, as does the traditional net cost method; the interest-adjusted techniques also time-value the premiums and the dividend payments. Rather than simply dividing the insurance cost by the number of years analyzed, the interest-adjusted techniques convert the total cost into equal annual cost outlays while considering the time value of money.

4. This adjustment is necessary because insurance premiums are paid at the start of the year, rather than at the end of the year. The ordinary future value annuity formula calculates the future value if the payments occur at the end of each period, rather than at the beginning:

<table>
<thead>
<tr>
<th>Ordinary annuity</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
</tr>
</thead>
<tbody>
<tr>
<td>of $X a period</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>for five periods</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Life insurance premiums, however, are paid at the start of each period. Life insurers will not cover you for a year, and then request the premium payment. Life insurance premiums are paid in advance, like rent payments:

<table>
<thead>
<tr>
<th>Annuity due</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
<th>$X</th>
</tr>
</thead>
<tbody>
<tr>
<td>of $X a period</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>for five periods</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Note how the premiums are paid at the beginning of each period rather than at the end. If each premium was invested when received, each annuity due payment would earn interest for one period more than each ordinary annuity payment. To adjust for this difference, the ordinary future value annuity formula can simply be multiplied by \((1 + i)\), where \(i\) is the interest rate, to obtain the future value annuity due factor. See the solution to the problem set immediately after the “True-False Questions solutions” for an illustration of how the future value annuity due factor is calculated and employed. How this factor can be obtained using a financial calculator is also explained.

5. Interest-adjusted cost data can be found in policy surveys published in Best's Review, Life/Health Edition. You can also ask your agent for this information. Some states publish shoppers’ guides and some personal finance magazines occasionally publish interest-adjusted cost data. Finally, a number of price-quote services are available online.
6. Using an interest-adjusted cost index in isolation is not enough. Other factors must be considered, such as the financial strength of the insurance company. Consumers are urged to shop for a policy and not an insurance company. The cost index must also be used to compare similar policies. Small differences in the cost indexes can be ignored as there may be other offsetting pros and cons associated with the policy or the insurer. The consumer should remember that the cost indexes apply to new policies and should not be used to determine whether a policy should be replaced. Finally, the type of policy you purchase should not be based solely on a cost index.

7. Other factors should be considered in addition to the strength of your present insurer. These factors include: your state of health and other factors affecting your ability to qualify for a new policy, the cost of getting out of your existing policy, the cost of getting into a new policy, tax implications should be reviewed, the incontestability and suicide clauses should be considered, and finally, remember that the individual recommending the change will probably receive some financial benefit if you replace the existing policy. This person may be placing his or her financial gain above your best interests.

8. The Linton yield is a method that can be used to determine the rate of return on the savings portion of a cash value life insurance policy. To calculate the Linton yield, each premium is divided into two parts: the cost of insurance and the savings component. The Linton yield is the average annual rate of return that must be earned on the saving portion of each premium to make the savings portion of the premiums grow to equal the guaranteed cash value at a specified time. Policies are compared based on the rates of return provided.

9. Belth’s yearly rate of return is calculated through the following formula:

\[ i = \frac{(CV + D) + (YPT)(DB - CV)(.001)}{(P + CVP)} - 1 \]

The yearly rate of return, \( i \), is equal to:

- In the numerator, the first term is the amount of funds available at the end of the year, the cash value (CV) at year-end plus dividends (D). The second term in the numerator is the assumed price of the protection component. It is equal to the yearly price per thousand (YPT) multiplied by the difference between the death benefit (DB) and the cash value at the end of the year. This product is multiplied by .001, a scale factor.
- The denominator is equal to the annual premium (P) plus the cash value at the end of the preceding policy year (CVP).
- The numerator is divided by the denominator and one is subtracted from this quotient to obtain the yearly rate of return.

10. Life insurance is provided a number of income tax benefits under the tax code. The cash value accumulates tax-free. If the policy is surrendered prior to a death claim, only the interest income (the difference in cost basis and cash value) is taxable. Life insurance policyowner dividends are received tax-free by the policyowner as these dividends are considered a refund of over-paid premium. The death benefit is received tax-free if taken as a lump sum. If the proceeds are paid through some type of annuity, then only the investment income is taxable. That portion of the periodic payment that represents a return of principal (death benefit) is received tax-free.
11. The gross estate includes the value of property you own when you die, plus one-half of the value of property owned jointly with a spouse, plus life insurance in which you have incidents of ownership, plus other property. This total can be reduced by funeral and administrative costs, estate settlement costs, probate costs, and charitable deductions.

12. Consumer experts typically make the following suggestions:
   - Determine if you need life insurance.
   - Estimate the amount of life insurance you need.
   - Decide on the best type of insurance for you.
   - Decide whether you want a policy that pays dividends.
   - Shop around for a low-cost policy.
   - Consider the financial strength of the insurer.
   - Deal with a competent agent.

Multiple Choice Questions

1. (c) Of the methods listed, only the traditional net cost and the surrender cost provide a dollars and cents per thousand per year cost index. The traditional net cost method has numerous flaws, most notably the failure to consider the time value of money. The surrender cost is more meaningful.

2. (c) Both statements are true. Insurance is often shown to be free (to have a negative cost) because the time value of money is ignored.

3. (c) The grace period is not a consideration in the policy replacement decision as it is a standard provision in all life insurance contracts. The grace period does not influence whether a policy is a “good” policy or a “bad” policy. All of the other choices represent valid concerns when considering policy replacement.

4. (b) Karen calculated the Linton yield. The Linton yield is the average annual rate of return required to transform the savings portion of each premium payment into the guaranteed cash value at a specified time.

5. (d) An assumed price per thousand is used in the calculation. The cash value increase from one year to the next and dividends paid to the policyowner are considered. A rate of return, rather than a cost per thousand per year, is the result of the calculations.

6. (a) The surrender cost is based upon the assumption that the policy will be surrendered after a specified period and that the policyowner will receive the cash value at that time. The surrender cost index is an interest-adjusted technique because the time value of money is taken into consideration.

7. (c) The ratings assigned are sometimes unreliable and confusing. Some insurers that have become insolvent had favorable ratings from one or more of the rating services before the company became insolvent. Confusion may also develop because the ratings assigned are not standard among the rating services, and at least five different services assign ratings.

8. (a) Nathan should use the net payment cost index. Three of the choices listed provide a cost per thousand per year of life insurance. The traditional net cost method has many flaws, and the surrender cost index assumes the policy will be surrendered after a specified period. The Linton yield calculates a rate of return rather than a cost per thousand.
9. (b) The Linton yield does not determine a cost per thousand per year. Rather, an average annual rate of return is calculated. The premium must be divided into the cost of protection and the savings to calculate the Linton yield.

10. (b) Policyowner dividends are received tax-free by the policyowner. Such dividends are considered to be a refund of over-paid premiums. If you are stockholder in a life insurance company, dividends you receive on your shares of stock are taxable. All of the other statements are true.

11. (b) The amount transferred to the surviving spouse is called the marital deduction.

12. (d) The best policy for you to purchase is the policy that best fits your needs.

**True/False**

1. **F** Comparing premiums will not tell you which policy is best. You must also consider what you receive in exchange for the premiums. For example, is the coverage participating and what is the guaranteed cash value after a specified period? There are factors besides cost that should also be considered, such as the financial strength of the insurer.

2. **F** There are wide variations in the cost of coverage. It is worthwhile to shop for a good policy because buying the wrong policy can cost you thousand of dollars over time, and it may be expensive to obtain coverage under a new policy.

3. **F** When an interest-adjusted method is used, the future value of each dividend payment is calculated, assuming a specified interest rate. Thus the timing and magnitude of dividend payments are considered.

4. **T**

5. **T**

6. **F** The future value ordinary annuity factor assumes the premiums are paid at the end of the period. Life insurance premiums, like rent payments, are paid at the start of the period. The future value annuity due factor must be used to properly value the cash flows.

7. **F** The surrender cost index per thousand per year will always be less than the net payment cost per thousand per year for policies with a cash value. Under the surrender cost method, the cash value is subtracted from the net premiums and the resulting difference is converted to an annual cost. Under the net payment cost method, the net premiums are converted to an annual cost. Note that under the net payment cost method, the cash value is not subtracted from the net premiums.

8. **F** Belth’s yearly rate of return method can be used for participating and nonparticipating policies. If a nonparticipating policy is analyzed, a value of zero is assigned for the dividend term.

9. **T**

10. **T**

11. **T**

12. **T**
Problems

1. a. The traditional net cost calculation:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total premiums for 20 years (20 × 248.60)</td>
<td>$4972.00</td>
</tr>
<tr>
<td>Less dividends for 20 years</td>
<td>−814.00</td>
</tr>
<tr>
<td>Net premiums for 20 years</td>
<td>4,158.00</td>
</tr>
<tr>
<td>Less cash value after 20 years</td>
<td>−4,314.20</td>
</tr>
<tr>
<td>Insurance cost for 20 years</td>
<td>−156.20</td>
</tr>
<tr>
<td>Net cost per year (−156.20/20)</td>
<td>−7.81</td>
</tr>
<tr>
<td>Net cost per thousand per year (−7.81/20)</td>
<td>−0.39</td>
</tr>
</tbody>
</table>

The traditional net cost is negative 39 cents per thousand dollars of coverage per year.

b. Before the surrender cost can be calculated, the proper annuity factor must be determined. As shown in the solution to Short Answer Question #4, the ordinary future value annuity factor must be adjusted to consider the fact that life insurance premiums are paid at the start of the year. To calculate the surrender cost and the net payment cost, the future value annuity due factor is required. This factor is the amount to which one dollar invested at the start of each year will become if credited with a specified interest rate.

The future value annuity due factor for 20 years, assuming 5 percent interest, is:

\[
\left( \frac{(1.05)^{20} - 1}{0.05} \right) \times 1.05 = 34.71925
\]

Note that this factor, 34.719, is the same factor illustrated in Exhibits 13.2 and 13.3 in your text. The cost comparison in those illustrations also involves 20 years and 5 percent interest.

Many students, especially those who are business majors, use calculators with financial functions. The future value annuity due factor is easily obtained using a financial calculator. You can input: $1 as the payment, 20 for \( N \), and 5 percent interest, and then compute the future value. If your calculator is in “ordinary annuity” mode, the resulting value you obtain is: 33.0660.

If you compound this value for one year at 5 percent (33.0660 × 1.05), you will get: 34.71925.

With this factor, we can calculate the surrender cost index:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future value of the premiums (248.60 × 34.71925)</td>
<td>$8631.21</td>
</tr>
<tr>
<td>Less future value of the dividends</td>
<td>−1163.00</td>
</tr>
<tr>
<td>Net premiums for 20 years</td>
<td>7468.21</td>
</tr>
<tr>
<td>Less cash value after 20 years</td>
<td>−4314.20</td>
</tr>
<tr>
<td>Insurance cost for 20 years</td>
<td>3154.01</td>
</tr>
<tr>
<td>Interest-adjusted cost per year (3154.01/34.71925)</td>
<td>90.84</td>
</tr>
<tr>
<td>Cost per thousand per year (90.84/20)</td>
<td>4.54</td>
</tr>
</tbody>
</table>

The surrender cost index is $4.54 per thousand per year.
c. The net payment cost index calculation:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future value of the premiums ((248.60 \times 34.71925))</td>
<td>$8631.21</td>
</tr>
<tr>
<td>Less future value of the dividends</td>
<td>$-1163.00</td>
</tr>
<tr>
<td>Net premiums for 20 years</td>
<td>7468.21</td>
</tr>
<tr>
<td>Interest-adjusted cost per year: ((7468.21/34.71925))</td>
<td>215.10</td>
</tr>
<tr>
<td>Cost per thousand per year ((215.10/20))</td>
<td>10.755</td>
</tr>
</tbody>
</table>

The net payment cost index is $10.755 per thousand per year.

2  a. The probability of death at age 30, from the mortality table, is .00114. The expected value of the insurer’s payment if the insured dies is $1.14 \(($1000 \times .00114)\). The present value of this expected payment is $1.0806 \(($1.14 \times .9479)\). The NSP is $1.08 per thousand at age 30.

b. A three-year term policy will require a single premium at the start of the coverage period. If death occurs during the period of coverage, the face value is paid at the end of the year in which death occurred. Death benefits can be at paid at end of the first year, end of the second year, or end of the third year. The NSP is the sum of the discounted expected death payments. The NSP is $4.15 per thousand.

<table>
<thead>
<tr>
<th>Age</th>
<th>Number Alive</th>
<th>Deaths</th>
<th>Probability of Death</th>
<th>Expected Payment</th>
<th>Discount Factor</th>
<th>PV of EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>9,707,516</td>
<td>13,979</td>
<td>.001440</td>
<td>1.440</td>
<td>.9479</td>
<td>1.3650</td>
</tr>
<tr>
<td>39</td>
<td>14,928</td>
<td>.001538</td>
<td>1.538</td>
<td>.8985</td>
<td>1.3819</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>15,970</td>
<td>.001645</td>
<td>1.645</td>
<td>.8516</td>
<td>1.4009</td>
<td></td>
</tr>
</tbody>
</table>

\[ \text{NSP} = 4.1478 \]

**Case Applications**

**Case 1**
Jenny’s follow-up question should be, “A-rated by whom?” At least four different organizations rate life insurance companies. As you can see in Exhibit 13.9 in your text, “A” is the third highest rating assigned by A.M. Best Company, the sixth highest rating assigned by Fitch, and the sixth highest rating assigned by Standard & Poor’s. Simply knowing the rating without knowing who assigned the rating or the rating scale provides an incomplete picture. In addition, each of the rating services considers different aspects of an insurer’s financial condition when assigning a rating. You should purchase a policy from an insurer that has received high ratings from several ratings services.

**Case 2**
John’s sudden interest in rewarding long-term customers coincides with the publication of the unfavorable surrender cost index of his company’s best-selling product. John’s idea is to award a “persistency bonus” that will increase the cash value of the policy every 10 years. Consider what happens to the surrender cost index when the cash value is increased. If you review the calculation, you will see that as the cash value increases, the surrender cost index declines. John is only increasing the cash value on 10-year anniversaries. However, most cost comparisons are performed using 10-year multiples (10-year and 20-year surrender cost indexes are often quoted; 4-, 11-, and 17-year surrender cost indexes are not often quoted). While John is rewarding long-term policyowners, he is also making the surrender cost index appear more favorable in selected years.