Life Insurance
Costs and Comparisons

Chapter Objectives

- Explore the life insurance purchase decision
- Discuss the selection of a financially sound life insurance company
- Explore product cost and cost disclosure
- Discuss individual life insurance evaluation techniques
- Discuss the issues concerning replacement of life insurance policies

Introduction

The life insurance consumer is faced with a bewildering array of policies from which to choose. Life insurance policies differ not only by type but also in their provisions. Further, the purchase decision is influenced by the selling technique and persuasiveness of the life insurance agent, the amount and quality of expected service, the financial strength and historical track record of the issuing company and the product's cost. All of these factors (and others) enter into the decision to purchase a particular life insurance policy. Thus, the life insurance purchase decision involves selecting the product and its characteristics; evaluating the company for financial strength, management quality and past and future expected performance; and evaluating the product's cost. The chapter is divided into three main sections, each of which addresses one of these categories of qualitative product consumption issues. (See Chapter x for a discussion of the psychological motivations for purchasing life insurance.)

Product Selection Issues

Life insurance contracts emphasize savings, protection or a combination of savings and protection. The ratio of savings to protection is a function of the type of insurance and its premium payment schedule. Whole life insurance contracts that are paid up in a short time have a higher cash value (savings) and lower protection (pure insurance) than those paid up over a longer period of time. How dividends are treated (retained to earn interest or used to purchase paid-up additions, buy one-year term insurance, reduce premium payments or pay the contract up sooner than the maximum number of scheduled payments) also influences the level and rate of change in the savings amount. The financial planner/purchaser needs to balance savings and protection to meet specific financial goals. For example, term insurance contracts provide death benefits and in only rare cases a small amount of savings. Whole life insurance contracts and universal plans provide a mixture of savings and protection. (Depending on the amount contributed in flexible-premium plans, the universal life contract may emulate a term, endowment or whole life plan.)

Term versus Whole Life

The buy-term-and-invest-the-difference (BTID) strategy seeks to minimize the cost of providing death protection by purchasing term insurance and accumulating wealth through savings. For example, one life insurance company charges $1,389 for a nonpar ordinary life insurance policy ($100,000 face amount) while charging $285 a year for five-year renewable term insurance. (A nonpar contract is one that does not pay

a dividend. Policyholders of mutual companies are eligible to receive policyholder dividends, whereas policyholders of stock companies are not.) Investing the premium difference between the two plans can accumulate substantial savings, especially over a long period of time. Proponents of the buy-term-and-invest-the difference strategy present several compelling arguments against purchasing whole life products:

- Both the term face amount and the side fund are available to meet financial goals. If level term and a side fund are used, the increasing sum (the invested difference) is a possible source of hedging for inflation. If a level amount is required to meet financial goals, the increasing savings fund off-sets the reduction in the face amount if decreasing term insurance is used.
- Life insurance needs are not as great during old age. Although assets are necessary to take care of permanent and temporary needs of later years, the savings fund should be sufficient to meet the requirements. (Appropriately designed plans require considering cash needs upon death as well. If assets are invested in non-liquid assets such as business pursuits, loss in value will occur if forced liquidation is necessary to meet cash demands upon death.)
- Earnings in the side fund may be significantly greater than the amounts credited to cash value accumulations. (Risk differentials are not considered here.)
- There is no protection from inflation (the purchasing power risk) with a traditional whole life insurance plan due to the fixed nature of the face amount.

Opponents of the buy-term-and-invest-the-difference strategy also present substantial arguments:

- Individuals may have problems affording term insurance coverage at an advanced age or may become uninsurable due to unanticipated medical problems. When term insurance is purchased, the premium amount increases at each term period. People may assume that increased income will enable them to handle the higher premiums, but the premiums may increase at a higher rate than income, or the increase in income might not materialize at all.
- Whole life insurance plans force saving. Many people are not capable of saving on a regular basis and benefit from the semi-compulsory nature of the whole life plan. Even those who save on a consistent basis must resist liquidating the savings prematurely or using the funds compulsively.
- Regular savers may not be skilled investors. Principal amounts may be lost, and the investment may grow less than in whole life insurance. The investor may not be able to achieve the degree of portfolio diversification provided by whole life.
- Life insurance needs continue beyond the ages for which term insurance is available. This is an important consideration because needs during later years may not be determinable at the time of purchase. By investing outside the policy, the insured gives up some creditor protection and tax sheltering. The rights of creditors in attaching cash value amounts are restricted. And, currently cash value increases are not taxable as current income.

The arguments surrounding the buy-term-and-invest-the-difference strategy have been the source of much controversy in the life insurance industry. Many life insurance producers have sold only whole life insurance, while others sell term insurance and savings plans. A whole industry has developed based on the replacement of whole life

insurance products with a combination of term and annuity products, one popular combination being a term policy combined with a tax-advantaged plan such as an IRA or a 403 (b) plan. The life insurance industry has developed nontraditional products that effectively combine term insurance and saving, providing competition for the buy-term-and-invest-the-difference strategy.

Electronic Spreadsheet Product Comparison

One way to analyze the buy-term-and-invest-the-difference strategy is to prepare an electronic spreadsheet. Two equations must be solved simultaneously for a "fair" comparison:

- **Death Benefits are the same.** The whole life face amount must equal the savings fund at the end of the prior year (zero in the first year) plus the amount of term insurance purchased plus the difference invested in the current year (Formula 1)
- **Premiums are the same.** The premium for the whole life insurance policy must be equal to the premium for term insurance plus the difference invested (Formula 2)

$$WFA_t = SF_{t-1} + TFA_t + D_t \quad \text{and} \qquad \text{Formula 1}$$

$$WP_t = \left(\frac{TFA_t}{1{,}000}\right) \times R_t + D_t \qquad \text{Formula 2}$$

or

$$D_t = WP_t - \left(\frac{TFA_t}{1{,}000}\right) \times R_t$$

where:

$t =$ The year indentifier
$WFA =$ Whole life face amount
$D =$ Difference invested

$SF =$ Savings fund at the end of the year
$WP =$ Whole life premium net of any premiums from the prior year
$TFA =$ Term face amount
$R_t =$ Rate per $1,000 of term insurance in year t

Solving both equations simultaneously results in:

$$WFA_t = SF_{t-1} + TFA_t + WP_t - \left(\frac{TFA_t}{1{,}000} \times R_t\right)$$

$$WFA_t = SF_{t-1} + WP_t + TFA_t\left[1 - \left(\frac{R_t}{1{,}000}\right)\right]$$

$$TFA_t \times \left[1 - \frac{R_t}{1{,}000}\right] = WFA_t - SF_{t-1} - WP_t$$

$$\frac{WFA_t - SF_{t-1} - WP_t}{1 - \left(R_t \diagup 1{,}000\right)} = TFA_t \qquad \text{Formula 3}$$

The resulting equation (Formula 3) provides the amount of term insurance required based on the other factors.

In the example mentioned earlier, the male insured may purchase a whole life insurance contract for $1,389 or follow the buy-term-and-invest-the-difference strategy. If the alternate term strategy is used, $1,389 is available to buy term insurance and invest the difference. As shown in Table 1, in year 1 (at age 35), $98,889 (calculated by Formula 3) of term insurance is purchased for $278. The remaining $1,111 is invested in a side fund earning 8 percent after tax. At the beginning of the second year $1,200 is available ($1,111 with interest added). Now only $97,695 of term insurance needs to be purchased to provide $100,000 of death benefits ($97,695 + $1,200 + $1,105) in the second year. This process continues for the length of time desired for the analysis. At the end of the period selected (ten years in this case), the investment fund ($16,580) is compared to the cash value amount ($11,400). In this example the buy-term-and-invest-the-difference strategy is clearly superior to purchasing ordinary life insurance in purely financial terms.

Two additional adjustments not found in Formula 3 are incorporated into Table 1. The first is an adjustment for participating dividends, and the second is a provision for the waiver-of-premium rider. If a participating policy is studied, the formulas use the net amount of premium paid, When the waiver-of- premium rider is attached to the whole life insurance policy, the benefits are counterbalanced by a disability income contract producing an equivalent dollar amount for the alternate strategy.

Table 1

BUY TERM AND INVEST THE DIFFERENCE (Nonpar; Male age 35 for $100,000 Face Value)

rate >> 0.08

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		Whole					Dis.					
	cash	Life	Dividend	Net		Term	Income	Term	Term	Diff.	Cum.	Inv. EOY
Age	value	Premium	Amount	Premium	Saved	Rate	Prem.	face	Prem.	Invested	Inv.	Value
35	0	1,389	0	1,389	0	2.81	0	98,889	278	1,111	1,111	1,200
36	0	1,389	0	1,389	1,200	2.91	0	97,695	284	1,105	2,305	2,489
37	900	1,389	0	1,389	2,489	3.04	0	96,415	293	1,096	3,585	3,872
38		1,389	0	1,389	3,872	3.22	0	95,045	306	1,083	4,955	5,351
39	3,700	1,389	0	1,389	5,351	3.44	0	93,582	322	1,067	6,418	6,932
40		1,389	0	1,389	6,932	3.70	0	92,020	340	1,049	7,980	8,619
41		1,389	0	1,389	8,619	4.00	0	90,354	361	1,028	9,646	10,418
42		1,389	0	1,389	10,418	4.31	0	88,575	382	1,007	11,425	12,339
43		1,389	0	1,389	12,339	4.66	0	86,676	404	985	13,324	14,390
44	11,400	1,389	0	1,389	14,390	5.05	0	84,648	427	962	15,352	16,580

Interest rate = .10; Tax rate = .20; After Tax rate = .08

(2) cash value for selected years shown

(5) net premium (3) - (4)

(6) saved (13), prior year

(7) term rate per $1,000

(8) for amount in (3)

(9) [100,000 - (3) +(4) - (6) + (8)] / {1.00 - [(7) / 1,000] }

(10) term premium: (9) / 1,000 x (7)

(11) (5) - (8) - (10)

(12) (13), prior year + (11)

(13) (12) x (1.00 + Rate); Rate = After Tax rate assumed

Temporary versus Permanent Protection

Selecting a product providing temporary protection or permanent protection is an additional consideration. Term life insurance policies are considered temporary products; the insured may outlive the policy period. Whole life products, including universal and indeterminate life, are considered permanent; the product exists until the insured desires to surrender the contract or death occurs. The appropriate product selection should be based on a matching principle. The length of the financial need should be matched with the product's length. The reader should recognize that one product may satisfy multiple needs. For example, a universal life policy may satisfy the need for long-term death expense, provide the vehicle for retirement income and handle the short-term dependency period of children. If the only financial problem is short-term dependency (no savings required), the universal life product may be appropriate if minimum contributions are made. (Minimum contributions will increase due to the insured's increase in age, and the product may become unaffordable.) Otherwise, term insurance is appropriate.

The premium payment plan must be decided on after the type of insurance coverage is selected. For example, if whole life insurance is required, the policy owner may pay up the insurance over various lengths of time, including 10 years, 20 years, or at age 65. Annual level premiums may be increased to pay up the policy in a shorter length of time. Present value techniques may be used to analyze which payment scheme is the most cost effective. The applicant could calculate the present value of anticipated payments (discounted for the time value of money and the probability of surviving and paying the premium) and choose the policy payment

plan producing the lowest present value. Present value, however, may not be the only consideration. There may be other psychological benefits that may modify the rule of selecting the payment scheme producing the lowest present value. Reasons include higher cash value amounts (more saving), the desire not to pay premiums for all of one's life and the issues surrounding affordability.

Participating versus Nonparticipating

The majority of life insurance in the United States is sold by stock and mutual companies. Many people believe that it is superior to purchase a life insurance policy from a mutual company (participating) than from a stock company, even though the initial premiums tend to be higher with the mutual. In mutual companies policy owners participate in favorable or unfavorable interest earnings, mortality experience and overhead expense. Any dividend returned to the policy owner is not considered new money and therefore is not taxed by the IRS. For many people a steady and increasing dividend payment provides psychological benefits. Individuals like an immediate return on their purchase, and the dividend options mentioned earlier may be exercised to satisfy immediate cash needs or used for anticipated future needs (retirement income).

The participating/nonparticipating issue adds another dimension to the purchase decision. This decision must be made on the basis of expected amount, opportunity costs, use of dividends and the overall cost of the product. Moreover, with the introduction of innovative life insurance products allowing the policy owner

to participate in investment performance, the distinction between participating and nonparticipating contracts becomes less clear.

Options

Policy options also need to be considered by the purchaser. Accidental death and disability, disability income, premium waiver and guaranteed insurability riders all contribute to the policy's cost as well as its benefits. Many life insurance companies package these riders so their cost is inseparable from the price of the basic policy. Also, the riders' benefits may apply only until a certain age even though the annual premium remains constant.

Evaluation of Companies

An effective purchase decision demands a purchase from a financially sound insurer. Selecting the "best" insurer from more than 2,000 life insurance companies in the United States would be a formidable, costly and time-consuming task. If found, the 'best" life insurance company today may not be so tomorrow. Therefore the consumer should make sure that the company selling the policy has a high rating based on past, current and expected financial data.

Anyone versed in finance and financial ratios could use liquidity, leverage and profitability ratios to analyze the life insurance company's balance sheet and income statement. Interpretation of the numbers, however, might be difficult due to the method of financial reporting. Since 1972 generally accepted accounting principles (GAAP) have been used for the certification of life insurance company financial

statements. However, generally available financial statements are based on statutory accounting principles and practices. Statutory accounting practices paint a conservative picture of the insurer's financial condition. The manner of accounting for expenses and the way reserves and securities are valued contribute to the complexity of analyzing the life insurance companies' financial information. Statements based on GAAP accounting are becoming more common.

The buyer should also be aware of any nonguaranteed aspects of life insurance contracts. Mutual insurers pay participating dividends based on the company's good or bad performance. The amount of future dividends reflect the quality of operations and investment performance. Because the future cannot be known, analysis of prior actual versus illustrative dividends may be a good indicator of future expectations. Current-assumption and indeterminate-premium life policies do not guarantee premium levels but set them based on prevailing financial considerations.

Regardless of the arguments of one form of organization being better than another (stock versus mutual), the reader must realize that financial quality cannot be based exclusively on the type of organization. There are good and bad providers of life insurance of all kinds, and the product is only as good as the financial ability of the organization to perform according to the contract.

Sources of Information

One standard source used for life insurance company quality ratings is Best's Insurance Reports (Life/Health Edition), published annually by A. M. Best Company,

Inc., Oldwick, New Jersey. Best's evaluates life insurance companies yearly based on several criteria that produce an overall rating for the firm. The principal factors used in rating life insurance companies are:

- the quality of underwriting;
- the cost of operations and how well the life insurance company is managed;
- the quality of investments;
- the adequacy of reserves to pay current and future liabilities; and
- the adequacy of net worth and the company's financial strength to absorb financial shock.

Before 1976 A.M. Best gave written recommendations based on the quality of the life insurance company. Starting with the 1976 edition, alphabetical ratings were assigned (as well as a rating based on the company's financial size according to net worth):

- A+ and A: Excellent
- B+ and B: Good
- C+: Fairly Good
- C: Fair

Not all life insurance companies are assigned ratings. When this occurs, the company either does not qualify for at least a C rating, is inactive, has provided incomplete financial data or is not currently eligible for a rating (five years of credible operating results are required). In addition, when a change has occurred to warrant a lower rating, *Best's* assigns a contingent rating. If the trend does not revert to its prior condition, the rating subsequently will be lowered.

Life insurance companies are also categorized into 15 net worth sizes. Net worth, the difference between assets and liabilities, is a measure of policyholders' safety. If reserves are undervalued or assets shrink due to security market conditions, the net worth provides a cushion of safety before liabilities exceed assets and insolvency occurs. Net worth is classified from Group I ($250,000 of policy-holders surplus or less) to Group XV ($100 million or more of policyholders' surplus).

When selecting a financially sound life insurance company, the buyer should select one that not only is currently rated high but also has historically been rated in the A and A + category. The excellent, long track record provides evidence of the long-run stability and quality of operations. A larger net worth position may not be as important as the overall quality of operations in selecting a life insurance company. Many financially sound small to medium-sized life insurance companies provide reasonably priced and competitive products.

Besides Best's, Standard & Poor's, Moody's and Duff & Phelps, among others, rate insurers' financial condition and claim-paying ability. Their rating systems are different from Bests. Consumers are becoming aware of the rating differences and are consulting multiple sources to get other views of a company's financial condition. Some consumers and financial planners are concerned about Best's close ties to and dependency on the life insurance industry and insurers' ability to influence the publication of their financial rating.

Costs and Cost Disclosure

Life insurance cost disclosure is a sensitive and controversial issue among academics and practitioners in the life insurance industry. Most people agree that there should be complete cost disclosure. However, because the life insurance contract is sold for a variety of reasons, and the “true cost” can be calculated only after the insured dies or the policy has been surrendered, the best that can be hoped for in presale cost disclosure is an index or an estimate of cost assuming a specific event, such as death or surrender, occurs. The intent of an index or rate of return is to provide a guide to compare similar policies so a low-cost product can be identified, but because the event chosen is unlikely to occur, the policy may not produce the lowest cost under all circumstances. Indexes purporting to measure the rate of return of the cash value component of the life insurance policy are misleading, because the product’s main purpose is to pay a death benefit.

When the other reasons life insurance is purchased are taken into account, and when the psychological benefits and the contribution of the life insurance product to an overall financial plan are considered, it becomes clear that there are factors of great value that cannot be measured directly. Cost and benefit disclosure thus can occur only in a financial sense and cannot measure the non-financial benefits of the product.

Many individuals erroneously equate the premium paid to the cost of the life insurance product. The cost of life insurance is normally not equal to the premium payment, because other cash flows are associated with the purchase. With participating policies, dividends result from favorable expense, mortality and

investment experience. Dividends are not guaranteed and may be higher or lower than illustrated during the sales process. In addition, terminal dividends may be available when a participating contract is surrendered. Terminal dividends are accrued dividends not currently paid but held for future disbursement.

All cash value life insurance products promise other benefits in addition to paying a death claim. Nonforfeiture values allow the insured to borrow against the cash value buildup or change the policy to the extended term or paid-up insurance options. (Withdrawal privileges are also found in newer forms of life insurance.) Some individuals borrow or withdraw cash value to invest the amount at a higher interest rate than charged on policy loans, increasing the value of the life insurance contract by using leverage.

The annual premium of some new life insurance products change based on economic conditions (current-assumption life or indeterminate-premium life), and some products allow policy owners to choose the premium payment level at inception (the minimum payment), with any excess amounts invested in a side fund. Many of these products allow the policy owner to self-direct the investments and bear the risk of investment performance. Moreover, variable life insurance products provide a changing face amount based on an underlying portfolio of securities.

As a result of all of these changes in the life insurance industry, determining the true cost of life insurance products is becoming more elusive and difficult to calculate. Retrospectively one might evaluate the cash flows after the occurrence of a certain event, such as death of the insured or the surrender of the contract. These methods are called ***event-specific***, because the cost calculation is based on an

event at an assumed point in time. However, the use of event-specific techniques still leaves the true cost of the product unknown, because the assumed event is unlikely to occur. Techniques using mortality assumptions and/or lapse rates are called ***group-average techniques***. The costs calculated by these methods are also not accurate, because the number calculated will be representative of only a fictitious average member of the group.

Cost comparison techniques developed for consumer use should be relatively easy to calculate from available information or they must be available from a reliable source and generally understandable. The cost comparison techniques developed for consumer use have been predominantly event-specific. Two policies are used through the remainder of this chapter to illustrate the various cost comparison techniques. Both policies are issued to a male, age 25, for $25,000. However, one policy is participating (par) and the other is not (nonpar). Table 2 provides the data for these policies.

The Traditional Net Cost (NC) Approach

The traditional net cost approach, even though forbidden in many states as a sales cost comparison technique, illustrates how cost can be presented. The NC approach is event-specific in that the policy owner is assumed to live a certain number of years and then surrender the contract. The NC is usually calculated at the end of the 10th and 20th policy years and is equal to the difference between all premiums paid and all cash flows returned to the policy owner. Thus the NC is calculated by taking these steps:

1. Add the premiums paid over the analysis period.

2. Subtract the following amounts from the total:

    a. all dividends paid;

    b. any terminal dividend; and

    c. ending cash value.

The remainder equals the net cost. The NC then can be divided by the number of years in the analysis to provide an annual level cost per year, and this result can be divided by the number of thousands of face amount to provide a net cost for each $1,000 per year. Table 3 provides the NC analysis of the two sample policies. Notice that when the NC analysis is made for longer periods of time the policy appears to pay for itself and produce a positive cash flow. This analysis implies that life insurance is costless. However, the NC approach is flawed, because it ignores the time value of money. In other words, it is assumed that the policy owner and the insurance company are indifferent to paying (receiving) the premiums today or in 10 or 20 years and that the timing of dividend distributions is irrelevant. Ignoring the time value of money distorts costs dramatically. The opportunity cost of money is important, especially if the analysis extends over long periods of time. Failing to consider the time value of money generally produces the negative or low cost in the NC approach.

Table 2 Life Insurance Contract Data for $25,000 Policies

	Non-Par Policy:*		Par Policy+							
							Total Dividends		Terminal Dividends	
	Cash Value Per		Dividends Per		Cash Value Per		Per		Per	
Year	$1,000	$25,000	$1,000	$25,000	$1,000	$25,000	$1,000	$25,000	$1,000	$25,000
1	$0	$0	$0	$0	0	0				
2	0	0	2.56	64.00	0	0				
3	0	0	2.87	71.75	3	75				
4	8	200	3.18	79.50	16	400				
5	17	425	3.49	87.25	24	600				
6	23	575	3.89	97.25	33	825				
7	34	850	3.95	98.75	45	1,125				
8	46	1,150	4.45	111.25	56	1,400				
9	58	1,450	4.74	118.50	68	1,700				
10	70	1,750	5.03	125.75	80	2,000	34.16	854.00	10.00	250.00
11	82	2,050	5.39	134.75	91	2,275				
12	93	2,325	5.79	144.75	105	2,625				
13	105	2,625	6.04	151.00	117	2,925				
14	118	2,950	6.53	163.25	132	3,300				
15	133	3,325	6.83	170.75	145	3,625				
16	145	3,625	7.01	175.25	159	3,975				
17	159	3,975	7.49	187.25	173	4,325				
18	173	4,325	8.25	206.25	189	4,725				
19	186	4,650	8.56	214.00	203	5,075				
20	204	5,100	8.98	224.50	219	5,475	105.03	2,625.75	18.00	450.00
Age 60	451	11,275	15.29	382.25	455	11,375				
Age 65	535	13,375	17.07	426.75	539	13,475				

Issued to Males Age 25

* Policy Fee = $15.00

* Premium = $250.75 ($9.43 per $1,000)

* Loan Rate = 6 percent

* Average = $10.03 per $1,000.

+ Premium = $341.50 ($13.66 per $1,000)

+ Loan Rate = 8 percent

Traditional Net Cost Analysis $25,000 Basis*

	Nonpar Policy		Par Policy	
	10 Years	20 Years	10 Years	20 Years
Total Premiums Paid	$2,507.50	$5,015.00	$3,415.00	$6,830.00
Less: Total Dividends Paid	0.00	0.00	854.00	2,625.75
Terminal Dividend	0.00	0.00	250.00	450.00
Cash Value, end of Year	1,750.00	5,100.00	2,000.00	5,475.00
Net Cost: All years	$757.50	($85.00)	$311.00	($1,720.75)
Per Year	75.75	(4.25)	31.10	(86.04)
Per year/per thousand	3.03	(0.17)	1.24	(3.44)

*Columns may not sum correctly because only two decimal places are shown.

Interest-Adjusted Methods

Interest-adjusted methods are used to calculate an index that eliminates the major flaw of the NC approach. This chapter discusses several of the event-specific interest-adjusted cost comparison techniques.

The Surrender Cost index

The **surrender cost index** (SCI) assumes that the policy owner surrenders the contract at the end of the analysis period. The SCI index provides an interest-adjusted yearly level cost of providing death protection. The mechanics of the SCI are to accumulate to the end of the analysis period (usually 10 and/or 20 years) all values adjusted for the time value of money so as to calculate the total interest-adjusted cost. Referring to Table 4, the total interest-adjusted cost (TIAC) is equal to all accumulated premiums minus all accumulated dividends, the terminal dividend and the final cash value. The TIAC is then divided by the appropriate future value of an annuity due factor

and then divided by the number of thousands of face amount. The result provides a yearly level amount that, if paid at the beginning of each year and accumulated at the assumed interest rate, will be equal to the total interest-adjusted cost at the end of the analysis period for each $1,000 of coverage. A three-year TIAC and SCI are calculated as follows:

$$TIAC = \left[P_1(1+i)^3 + P_2(1+i)^2 + P_3(1+i)^1\right] - \left[D_1(1+i)^2 + D_2(1+i)^1 + D_3 + TD + CV_3\right]$$

$$SCI = \frac{TIAC}{FVA_d \times F}$$

where:

$P_n =$ Premium in year n
$D_n =$ Dividend in year n
$TD =$ Terminal dividend
$F =$ Number of thousands of face amount
$CV =$ Cash value, end of analysis period
$i =$ Assumed interest rate
$FVA_d =$ Future value, annuity due factor
20 years = 34.7193 (5%)
10 years = 13.2068 (5%)

The TIAC calculates the difference between the future value of the cash inflows and outflows if the policy is surrendered at the end of the analysis period. When the TIAC (per thousand of face) is divided by the future value of the annuity due factor, the TIAC is leveled such that the index when accumulated at the i rate equals the TIAC (per $1,000 of face amount) as follows:

$$\frac{TIAC}{F} = SCI(1+i)^3 + SCI(1+i)^2 + SCI(1+i)^1$$

The calculation of the SCI for the two hypothetical life insurance contracts is presented in Table 4. Each expected dividend is multiplied by a dividend interest factor. Since dividends are paid at the end of the year, the first dividend grows for 19 years.

Each premium payment is multiplied by a premium interest factor. In this case, premiums are paid at the beginning of the year so the first premium grows for 20 years. For each successive year the compounding period reduces by one. The resulting totals are the accumulated interest-adjusted premiums and dividends. The SCI is calculated as described above for the 20-year period for both the participating and the nonparticipating policies. A lower SCI is generally better, however, small differences may not be significant.

The Net Payments Cost Index

Instead of assuming that the policy owner surrenders the contract at the end of the analysis period, as in the SCI, the net payments cost index (NPI) assumes that the insured dies at the end of the analysis period. The NPI is calculated in the same manner as the SCI, except the terminal dividend (TD) and the cash value (CV) at the end of the analysis period are not considered. These values (cash flows) are not available if the policy terminates because of a death claim. Thus TD and CV will always be equal to zero (0) when the NPI is calculated. Table 5 shows the calculations for the NPI.

The NPI and the SCI indexes are similar in that a lower number means a relatively lower cost. Because the terminal dividend and the cash value are not considered in the NPI procedure, the SCI index will be equal to or lower than the NPI when the analysis is made on the same contract. When there are no dividends and no cash value (e.g., nonparticipating term insurance), the indexes are equal for the same contract.

Table 4 Surrender Cost Index Method, 5 Percent: 20-Year Analysis*

	PAR CONTRACT+					NONPAR CONTRACT++				
Year	Dividend	Interest factor dividend	Interest factor premium	Accumu-lated premium	Accumu-lated dividend	Dividend	Interest factor dividend	Interest factor premium	Accumu-lated premium	Accumu-lated dividend
1	$0.00	2.53	2.65	$36.24	$0.00	0.00	2.53	2.65	$26.61	$0.00
2	2.56	2.41	2.53	34.52	6.16	0.00	2.41	2.53	25.35	0.00
3	2.87	2.29	2.41	32.87	6.58	0.00	2.29	2.41	24.14	0.00
4	3.18	2.18	2.29	31.31	6.94	0.00	2.18	2.29	22.99	0.00
5	3.49	2.08	2.18	29.82	7.26	0.00	2.08	2.18	21.89	0.00
6	3.89	1.98	2.08	28.40	7.70	0.00	1.98	2.08	20.85	0.00
7	3.95	1.89	1.98	27.05	7.45	0.00	1.89	1.98	19.86	0.00
8	4.45	1.80	1.89	25.76	7.99	0.00	1.80	1.89	18.91	0.00
9	4.74	1.71	1.80	24.53	8.11	0.00	1.71	1.80	18.01	0.00
10	5.03	1.63	1.71	23.36	8.19	0.00	1.63	1.71	17.15	0.00
11	5.39	1.55	1.63	22.25	8.36	0.00	1.55	1.63	16.34	0.00
12	5.79	1.48	1.55	21.19	8.55	0.00	1.48	1.55	15.56	0.00
13	6.04	1.41	1.48	20.18	8.50	0.00	1.41	1.48	14.82	0.00
14	6.53	1.34	1.41	19.22	8.75	0.00	1.34	1.41	14.11	0.00
15	6.83	1.28	1.34	18.31	8.72	0.00	1.28	1.34	13.44	0.00
16	7.01	1.22	1.28	17.43	8.52	0.00	1.22	1.28	12.80	0.00
17	7.49	1.16	1.22	16.60	8.67	0.00	1.16	1.22	12.19	0.00
18	8.25	1.10	1.16	15.81	9.10	0.00	1.10	1.16	11.61	0.00
19	8.56	1.05	1.10	15.06	8.99	0.00	1.05	1.10	11.06	0.00
20	8.98	1.00	1.05	14.34	8.98	0.00	1.00	1.05	10.53	0.00
Total				$474.26	$153.52				$348.23	$0.00

	Par Contract	Nonpar Contract
Surrender Cost Index (20 years) =		
Premiums accumulated at interest	$474.26	$348.23
Less: Dividends Accumulated	153.52	0.00
Terminal dividend	18.00	0.00
Cash value, end of analysis year	219.00	204.00
	$83.75	$144.23
Divided by future value, annuity due factor +++	34.7193	34.7193
Surrender Cost Index	2.41	4.15

*Columns may not sum correctly because only two decimal places are shown.

+ Premium = $13.66; $1,000 basis. ++Premiuim = $10.03; $1,000 basis. +++ For 10 years, divide by 13.2068.

Table 5 Net Payments Cost Index Method, 5 Percent: 20-Year Analysis*

	Par Contract +	Nonpar Contract ++
Net Payments Cost Index (20 years) =		
Premiums accumulated at interest	$474.26	$348.23
Less: Dividends Accumulated	153.52	0.00
Terminal dividend	0.00	0.00
Cash value, end of analysis year	0.00	0.00
	$320.74	$348.23
Divided by future value, annuity due factor +++	34.7193	34.7193
Net Payments Cost Index	9.24	10.03

*Columns may not sum correctly because only two decimal places are shown.

+ Premium = $13.66; $1,000 basis.

++Premiuim = $10.03; $1,000 basis.

+++ For 10 years, divide by 13.2068.

The Equivalent Level Annual Dividend

The **equivalent level annual dividend (ELAD)** provides a measure of the importance of participating dividends in the SCI or NPI calculation. Specifically, when the ELAD is added to the SCI or NPI, the resulting index number reflects the relative cost of the participating policy if no dividends are paid during the analysis period. Illustrated dividends are accumulated to the end of the analysis period, and the sum is divided by the appropriate future value of an annuity due factor times the number of thousands of face amount. A three-year ELAD would be calculated as follows:

$$ELAD = \frac{D_1(1+i)^2 + D_2(1+i)^1 + D_3}{FVA_d \times F}$$

The 20-year ELAD calculation is provided in Table 6. If no dividends are paid, the cost represented by the SCI or NPI index would understate the relative cost of the

product. Thus, when the ELAD is added to the SCI or NPI indexes for the participating policies, a cost index is calculated based on the assumption that no dividends will be paid. The same results could be calculated by using zero for the dividend amount in the participating NPI or SCI calculations. Note that the ELAD calculation is equivalent to determining the interest-adjusted dividend amount in the SCI and NPI calculations.

Even though the SCI, NPI, and ELAD indexes are relatively easy to calculate and understand, these interest-adjusted methods have several theoretical flaws. First, because the NPI, SCI and ELAD indexes are calculated on the values on a certain date (normally 10 or 20 years), policy values may be manipulated by an insurance company to provide an index that is not representative of the entire contract term. Second, when different event-specific indexes are used, conflicting ranks of policies may occur. The NPI focuses on death at the end of the analysis period, while the SCI assumes a surrender to terminate the contract. When a conflict occurs, the evaluator must judge whether the payment of a death claim is more important than the accumulation of cash values. If the person does not plan to use the loan nonforfeiture option or surrender the policy, the NPI may be more representative of the cost. Several studies have investigated which cost index provides the best summary of policy values. These studies generally conclude that the choice of index does not matter, because policy costs (measured by indexes) are ranked similarly.

The third criticism of indexes involves the use of nonguaranteed values. Cost comparison techniques do not recognize the difference between guaranteed and nonguaranteed components in the calculation. Illustrated dividends are not guaranteed. In addition, new life insurance products have premiums, face amounts and cash values

that are determined by future economic conditions. Thus, as noted, only in retrospect can an accurate cost be calculated.

The fourth criticism involves the use of indexes for comparing dissimilar products. It is debatable whether dissimilar policies can be compared accurately by using these interest-adjusted techniques. For example, it may not be appropriate to compare participating policies with ones that do not pay dividends. If the ELAD is added to the SCI or NPI, a worst-case cost for the participating policy would be compared to a normal situation for the nonparticipating policy. The SCI and NPI are likely to be lower for the normal participating policy; but when the ELAD is added to remove the dividend payments, the rankings are likely to switch.

Table 6 Equivalent Level Annual Dividend, 5 Percent: Analysis of 20-Year Par Contract*

Year	Dividend per thousand	Interest Factor	Accumulated Dividend
1	$0.00	2.53	$0.00
2	2.56	2.41	6.16
3	2.87	2.29	6.58
4	3.18	2.18	6.94
5	3.49	2.08	7.26
6	3.89	1.98	7.70
7	3.95	1.89	7.45
8	4.45	1.80	7.99
9	4.74	1.71	8.11
10	5.03	1.63	8.19
11	5.39	1.55	8.36
12	5.79	1.48	8.55
13	6.04	1.41	8.50
14	6.53	1.34	8.75
15	6.83	1.28	8.72
16	7.01	1.22	8.52
17	7.49	1.16	8.67
18	8.25	1.10	9.10
19	8.56	1.05	8.99
20	8.98	1.00	8.98
			$153.52

Accumulate Dividend	$153.52
Divided by Annuity Due Factor	34.7193
Equivalent level annual Dividend	4.42

SCI	2.41	NPI	9.24
ELAD	4.42	ELAD	4.42
Cost Index	6.83	Cost Index	13.66

*Columns may not sum correctly because only two decimals are shown.

Sources of Index Information

Instead of calculating these indexes by hand, the consumer may refer to published sources of indexes. Two main sources of readily available index information are Life Rates & Data published by the National Underwriter Company of Cincinnati, Ohio, and Best's Flitcraft Compend published by the A. M. Best Company of Oldwick, New Jersey. Both of these publications are updated annually and report policy information as well as indexes on life insurance plans offered by many companies.

Belth's Single-Year Method

Use of the Belth single-year method allows the consumer to determine if life insurance products are priced reasonably.[1] The Belth method calculates a yearly price for the protection provided by the contract. The yearly price is then com-pared to benchmark figures to determine the relative cost of the policy. Table 7 presents the benchmarks and the decision rules.

The following formula is used to calculate Belth's yearly cost of protection for a given policy year t:

$$\text{Cost of Protection} = \frac{(P_t + CV_{t-1})(1+i) - (CV_t + D_t)}{(FA_t - CV_t) \Big/ 1{,}000}$$

where:

$P =$	Premium
$CV =$	Cash value
$D =$	Dividend
$FA =$	Face amount
$i =$	Assumed interest rate (.06 recommended)

The first term in the numerator in the formula [$(P_t + CV_{t-1})(1+i)$] above calculates the wealth at the end of the year, given that the policy owner surrenders the contract at the beginning of the year. The prior end-of-year cash value amount plus the premium amount may be invested at rate i, resulting in a higher future amount. If the policy owner maintains the contract (pays the premium), the wealth position at the end of the year will be ($CV_t + D_t$), the cash value amount at the end of the year plus any dividend distributions. The difference between these two numbers represents the price paid for

the life insurance protection in that year. When the numerator is divided by the thousands of protection [FA_t - CV_t / *1,000*], the yearly price for each $1,000 of protection results. The reader should note that the amount of protection is not the face amount but the difference between the face amount and the cash value. For a numerical example, refer to the participating contract in Table 2. The price of protection for the tenth year is calculated as follows:

Cost of protection

$$= \frac{(P_{10} + CV_9)(1 + .06) - CV_{10} + D_{10}}{FA_{10} - CV_{10} \big/ 1{,}000}$$

$$= \frac{(341.50 + 1{,}700)(1.06) - (2{,}000 + 125.75)}{(25{,}000 - 2{,}000) \big/ 1{,}000}$$

$$= \frac{(2{,}163.99 - 2{,}125.75)}{23} = 1.66$$

The benchmark for under age 30 is $1.50 (from Table 7). Because the price of protection for Year 10 is greater than the benchmark but less than two times $1.50 ($3.00), the relative cost is fairly low. Individuals interested in analyzing each policy year may find some policies are more costly than others in their early years and others are more expensive in their later years, thus making the time frame of policy continuation important.

[1] Joseph M. Belth, "Is Your Life Insurance Reasonably Priced? How to Evaluate an Existing Life Insurance Policy," Insurance Forum 9, No. 6, June 1982, pp. 165-168. See also Joseph M. Belth, "How to Buy Cash-Value Life Insurance," Insurance Forum 10, No. 10, October 1983, pp. 229-232.

Table 7 Benchmarks and Rules for Belth's Single-Year Method

Benchmarks	
Age	Price
Under 30	$1.50
30-34	2.00
35-39	3.00
40-44	4.00
45-49	6.50
50-54	10.00
55-59	15.00
60-64	25.00
65-69	35.00
70-74	50.00
75-79	80.00
80-84	125.00

Rules	
If:	Relative Cost is:
Price < Benchmark	Very low
Benchmark < Price < 2 x Benchmark	Fairly low
2 x Benchmark < Price < 3 x Benchmark	Fairly high
Price > 3 x Benchmark	Very high

The Linton Yield

The Linton yield was developed to compare whole life insurance to the buy-term-and- invest-the-difference strategy.[2] To calculate the Linton yield, the premium on the whole life plan less any annual dividend is assumed to purchase a sufficient amount of term insurance to create an investment fund such that the sum of the two equals the whole life face amount. At any point the separate investment account plus the term insurance equals the whole life face amount. The Linton yield is the rate of return generated on the separate investment account so the accumulated fund's amount will

[2] See Albert L. Auxier, "The ABC's of the Linton Method," CLU Journal, October 1981, pp. 44-49, for a further explanation of the Linton yield.

be equal to the cash value of the whole life insurance contract at the end of the analysis period.

The Linton yield can be calculated with the use of an electronic spreadsheet (see Table 8). The spreadsheet used to construct Table 1 can also be used to calculate the Linton yield. The Linton yield is found by changing the interest rate assumption earned on invested funds until the separate fund approximates the cash value at the end of a selected year (in this case, at the end of the 10th policy year). The Linton yield equals 1.57 percent for the illustration, and any investor could achieve better results. At the end of Year 10 the separate fund is equal to the cash value of the whole life insurance policy ($11,400).

Table 8 Calculation of Linton Yield (Nonpar; Male age 35 for $100,000 Face Value

rate >> 0.0157

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		Whole					Dis.					
	cash	Life	Dividend	Net		Term	Income	Term	Term	Diff.	Cum.	Inv.
Age	value	Premium	Amount	Premium	Saved	Rate	Prem.	face	Prem.	Invested	Inv.	EOY Value
35	0	1,389	0	1,389	0	2.81	0	98889	278	1111	1111	1129
36	0	1,389	0	1,389	1,129	2.91	0	97767	285	1104	2233	2268
37	900	1,389	0	1,389	2,268	3.04	0	96637	294	1095	3363	3416
38		1,389	0	1,389	3,416	3.22	0	95502	308	1081	4498	4568
39	3,700	1,389	0	1,389	4,568	3.44	0	94367	325	1064	5633	5721
40		1,389	0	1,389	5,721	3.70	0	93235	345	1044	6765	6871
41		1,389	0	1,389	6,871	4.00	0	92108	368	1021	7892	8016
42		1,389	0	1,389	8,016	4.31	0	90987	392	997	9013	9154
43		1,389	0	1,389	9,154	4.66	0	89876	419	970	10124	10283
44	11,400	1,389	0	1,389	10,283	5.05	0	88776	448	941	11224	11400

a Linton rate of .0157 is found by trial and error.

(2) cash value for selected years shown
(5) net premium (3) - (4)
(6) saved (13), prior year
(7) term rate per $1,000
(8) for amount in (3)
(9) [100,000 - (3) +(4) - (6) + (8)] / {1.00 -[(7) / 1,000] }
(10) term premium: (9) / 1,000 x (7)
(11) (5) - (8) - (10)
(12) (13), prior year + (11)
(13) (12) x (1.00 + Rate); Rate = After Tax rate assumed

Yearly Rate of Return

The yearly rate of return ($YROR_t$) in year t measures the annual holding period return of the "benefits" relative to the "cost" of the cash value policy.

$$YROR_t = \frac{Benefits}{Costs} - 1$$

$$YROR_t = \frac{CV_t + D_t + \left[R_t \times \left(F_t - CV_t\right)/1{,}000\right]}{P_t + CV_{t-1}} - 1$$

where:
CV, = Illustrated cash - end of policy year t
D, = Illustrated dividend - end of policy year r
R, = Mortality charge for $1,000 protection in year t
F, = Projected death benefit - end of year t
P, = Beginning of year t

Table 9 provides the results of the YROR calculation for the hypothetical participating contract found in Table 2. The cost of protection is estimated by a representative low-cost annual renewable term policy. When comparing policies, one may find the YROR for one policy is not consistently higher than the other, and depending on the term rates used as well as the progression of the cash value and dividends, the YROR may not exhibit a consistent pattern.

Table 9 Illustration of Yearly Rate of Return Male Age 25

1	2	3	4	5	6	7
Year	Cash Value $25,000	Illus. Div. $25,000	Term Rate		Premium + Cash Value (BOY)	YROR
1	0	$0	1.11	27.75	341.50	-0.919
2	0	0.00	1.11	27.75	341.50	-0.919
3	0	0.00	1.12	28.00	341.50	-0.918
4	0	0.00	1.13	28.25	341.50	-0.917
5	0	0.00	1.14	28.50	341.50	-0.917
6	0	0.00	1.16	29.00	341.50	-0.915
7	0	0.00	1.19	29.75	341.50	-0.913
8	0	0.00	1.22	30.50	341.50	-0.911
9	0	0.00	1.27	31.75	341.50	-0.907
10	0	0.00	1.32	33.00	341.50	-0.903
11	0	0.00	1.40	35.00	341.50	-0.898
12	0	0.00	1.47	36.75	341.50	-0.892
13	0	0.00	1.58	39.50	341.50	-0.884
14	0	0.00	1.68	42.00	341.50	-0.877
15	0	0.00	1.80	45.00	341.50	-0.868
16	0	0.00	1.94	48.50	341.50	-0.858
17	0	0.00	2.08	52.00	341.50	-0.848
18	0	0.00	2.24	56.00	341.50	-0.836
19	0	0.00	2.43	60.75	341.50	-0.822
20	0	0.00	2.65	66.25	341.50	-0.806

(5) CVt + Dt + (Rt) x (Ft - CVt) /1000
(6) Pt + CVt-1

Equal Outlay

A particularly useful method in analyzing cash value contracts including universal life is the equal outlay method. Many agents use variations of this method in their sales

presentation due to its ease of use and comprehensibility to consumers. The buy-term-and-invest-the-difference analysis is a variation of the equal outlay method. The method can be used to directly compare any cash value life insurance policy.

There is, however, some difficulty in interpretation when comparing dissimilar policies. Typically the equal outlay method is used to compare a traditional cash value policy with nontraditional ones or two nontraditional policies. In the first case the flexible premium and the face amount of the ULI policy may be set at the traditional policy's level. In the second case a feasible, arbitrary premium and initial face amount may be selected for both policies. (The face amount may change based on projected dividend distributions used to purchase paid-up insurance amounts or to accumulate at interest. Investment results may also change the face amount.)

The equal outlay method assumes the same premium and face amount for the alternative policies. The insurance policy with the highest cash surrender value and death benefits after a specified period of time is estimated to be superior to the other. If there are any distributions such as participating dividends, the amounts may be used to increase the death benefits and the surrender amount. The numbers can be supplied by the sales agent.

An additional consideration is the investment performance of the insurer. The investment rate of return should be fixed in the nontraditional contracts to isolate the influence of mortality costs and expenses. (Some practitioners advocate using the guaranteed rate. The guaranteed rate, however, is not representative of the amount likely to be earned.) Presentations may be made based on the guaranteed rate, a historical rate and a projected rate.

Financial Planning Issues: The Replacement Decision

Sometimes it is advantageous for a policy owner to replace an existing life insurance policy with a new one providing essentially the same face amount of coverage, even though the new annual premium will be higher because of the insured's age. When replacement takes place, either the policy owner switches to a similar cash value contract or life insurance can be provided by term insurance. Sales agents who make a living encouraging insureds to replace existing life insurance policies with new ones may mislead policy owners into making a poor decision. Similarly, conservationists-agents who want old life insurance policies to persist may also persuade the policy owner to make a disadvantageous decision. The consumer must always assess the adequacy of his or her financial plan to determine if the change is warranted. Permanent life insurance may still be required. On the other hand, term insurance may be adequate for one's needs.

Before a replacement occurs, certain factors need to be considered. First, when a life insurance policy is replaced, there are search costs associated with any prospective purchase. The life insurance companies, their contracts and the agent all must be evaluated. In addition, acquisition costs must be paid when a new life insurance contract is purchased. These costs include the agent's commission, policy fees, medical exams, taxes and other overhead expenses. As noted, due to these acquisition costs, cash value life insurance provides low or no cash value amounts during the first few years. However, the removal and investment of the cash value in the original policy may overcome this objection to the low cash value amount. With regard

to the incontestable and suicide clauses, the purchaser of a new life insurance contract is subject to the time limits imposed by the new contract. Insurability must also be considered. If the health of the insured is impaired, it may be impossible to replace the old policy, or the increased premium due to poor health may make the replacement financially unattractive. Before surrendering the old contract, the insured should have the new life insurance policy in force. This will preclude the possibility of losing all life insurance coverage when it is not available due to poor health.

Tax considerations are also important.[3] When the old life insurance contract is surrendered, there may be ordinary tax on the excess received over the cost basis. The cost basis is the sum of all premiums paid less any participating dividends and cash value received when surrendered (assuming no loans are outstanding). For example, if all dividends are paid to the policy holder over the 20 years (see Table 2), the policy owner would pay ordinary tax on $1,720.75, calculated as follows:

Premiums paid	$ 6,830.00
Dividends	- 3,075.75
Cost Basis	3,754.25
Cost Basis	3,754.25
Cash value	5,475.00
Excess over basis	$ 1,720.75

Individual policy clauses must also be considered. Besides the incontestability and suicide clauses already mentioned, the nonforfeiture options and settlement options need to be reviewed. The absolute amount of the cash value and any illustrated

[3] The reader should be aware of the possibility of a tax-free exchange. For an excellent discussion, refer to Theodore Paul Manno and Richard T. Nolan, 'Internal Revenue Code Section 1035 and the Other Side of Exchange Programs," Journal of the American Society of CLU 39, No. 6, November 1985, pp. 66-73.

dividends will be readily available to evaluate. However, the amount of life insurance provided in the paid-up insurance option and the length of insurance provided in the extended term option may differ depending on the mortality tables used. This aspect is difficult to evaluate in that not only is the new policy issued at an older age, but the level of cash value will not allow easy comparison. Even though this aspect of nonforfeiture options is difficult to analyze, loan rates are relatively easy to compare. Newer life insurance policies generally have a higher loan rate than older life insurance contracts.

Interest rates used in settlement clauses vary according to the contract. Higher assumed (sometimes guaranteed) interest rates for the interest, fixed-period, fixed-amount and life income options will increase settlement amounts. Moreover, old life insurance policies may pay higher annuity rent if more deaths were predicted than new contracts when life annuity settlement calculations are made. In this case a switch to a new life insurance contract would provide lower rent payments if a life annuity settlement option is selected.

Review Questions

1. Why does the life insurance premium not reflect the cost of the product?
2. What arguments are used to convince people not to use the buy-term-and-invest-the-difference strategy?
3. What arguments corroborate the buy-term-and-invest-the-difference strategy?
4. Review Table 1 and the formulas used in the buy-term-and-invest-the-difference analysis. Does the spreadsheet analysis conform to the requirements that equal dollar amounts are spent regardless of whether whole life insurance is purchased

or the buy-term-and-invest-the-difference strategy is used during the period? What about the amount of protection provided by either strategy?

5. What is meant by temporary and permanent protection?
6. How do participating dividends affect the purchase decision? Why are participating dividends not guaranteed?
7. What are the main reasons for the difficulty in analyzing the stability and quality of a life insurance company?
8. When evaluating the financial position of the life insurance company, why is Best's concerned about (1) quality of underwriting, (2) overhead and management, (3) investments and (4) reserve adequacy?
9. Why can't the true cost of life insurance be disclosed when the life insurance contract is sold?
10. Distinguish between *event-specific* and *group-average* techniques in cost disclosure index calculations.
11. What is wrong with using the traditional net cost approach when disclosing life insurance cost?
12. Cost indexes are based on the assumption that a certain event occurs. What is the event in the surrender cost index and in the net payment cost index?
13. What rationale is used for adding the equivalent level annual dividend to the NPI and the SCI when evaluating participating policies? How does one interpret the resulting number?

14. Compare Belth's single-year method to the NPI and SCI methods for comparing cost. Which method is more accurate? More complicated? Easier to understand? Which provides more information?
15. How is the buy-term-and-invest-the-difference analysis related to the Linton yield?
16. Briefly describe the benefits and costs of replacing a life insurance contract.
17. Calculate the 10 - year NPI, SCI and ELAD for the following contract (assume a 5 percent interest rate). Yearly premium (whole life, $50,000) is $1,200 (male, age 45). Terminal dividend = $100 (end of Year 10). Cash value (end of Year 10) = $8,950.

Year	Illustrated Dividends
1	0
2	207
3	243
4	280
5	319
6	368
7	417
8	466
9	515
10	564

18. Refer to the previous question. Perform a buy-term-and-invest-the-difference analysis over the 10 - year period. Term insurance rates are as follows:

Year	Age	Rate per $1,000
1	45	3.33
2	46	3.62
3	47	3.94
4	48	4.39
5	49	4.88
6	50	5.45
7	51	6.08
8	52	6.83
9	53	7.67
10	54	8.67

Disability income premium is $43. The rate of return on investments be-fore tax is 10 percent, and the average tax rate is 22 percent.

19. Calculate the Linton yield using the information contained in questions 17 and 18.

Bibliography

Cherin, Antony C., and Robert C. Hutchins. '"The Rate of Return on Universal Life Insurance." Journal of Risk and Insurance, December 1987, p. 691.

Chung, Yosup, and Harold Skipper, Jr. 'The Effect of Interest Rates on Surrender Values of Universal Life Policies." Journal of Risk and Insurance, June 1987, p. 641.

Goodwin, Dave. "Replacement: A Sin or a Service?" Best's Review (Life/Health Edition), January 1990, p. 48.

King, Carole. 'The Fine Art of Comparing Policies." Best's Review (Life/Health Edition), February 1986, p. 42.

Schleef, Harold J. 'Whole Life Cost Comparisons Based upon the Year of Required Protection." Journal of Risk and Insurance, March 1989, p. 83.