

FN241

Risk Management and Insurance
Buying Life Insurance

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Buying life insurance

- Premature death & financial impacts
- Amount of life insurance to own
- Determining the cost of life insurance
- Rate of return on saving component
- Shopping for life insurance

Premature Death

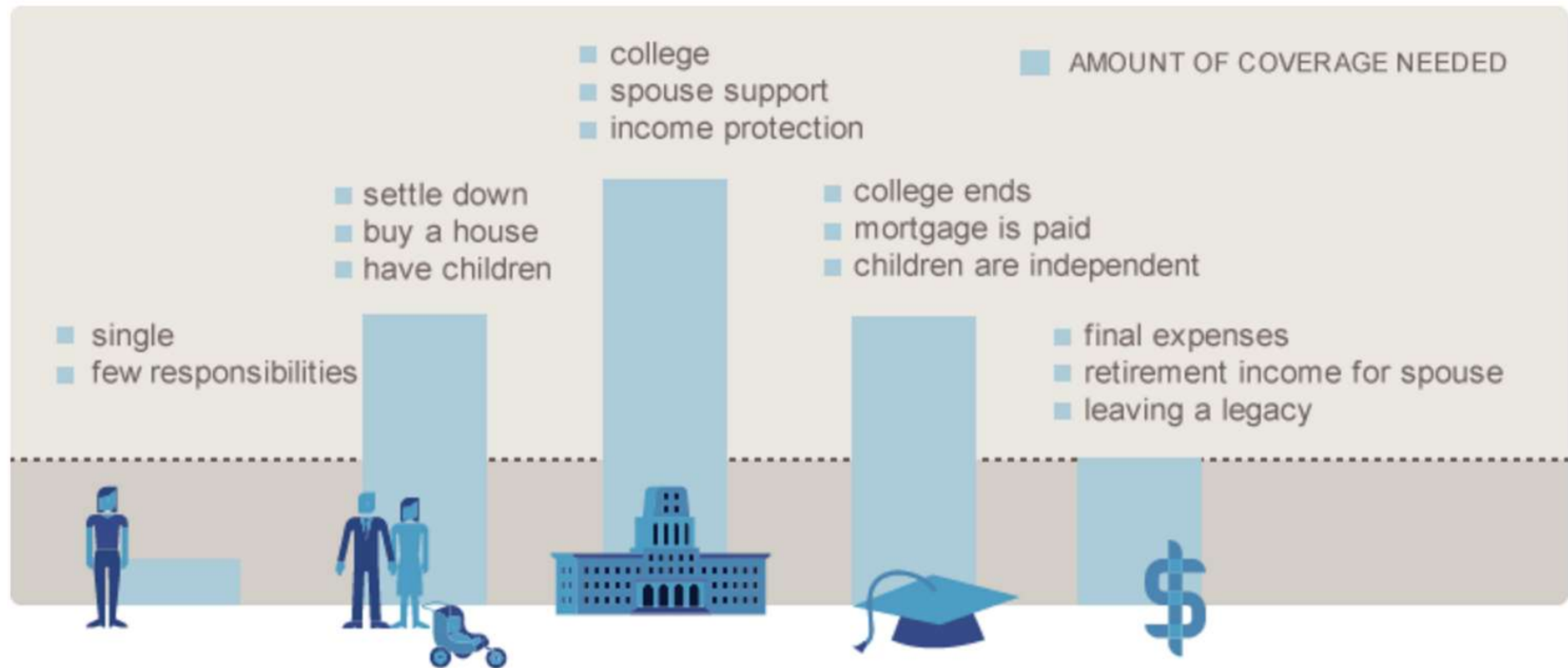
- Premature death can be defined as the death of a family head with outstanding unfulfilled financial obligation
 - Can cause serious financial problems for the surviving family members
 - The deceased's future earnings are lost forever
 - Additional expenses are incurred
 - Some families will experience a reduction in their standard of living

Premature Death

- Life expectancy has increased significantly over the past century
 - Thus, the economic problem of premature death has declined
 - Millions of people still die annually from heart disease, cancer and strokes
- The purchase of life insurance is financially justified if the insured has earned income and others are dependent on those earnings for financial support

Premature Death

How Life Insurance Needs Can Change Over Time



You need an approach that helps you avoid buying insurance that does not last long enough and buying permanent insurance for temporary needs.

Amount of Life Insurance to Own

- A few approaches can be used to estimate the amount of life insurance to own

1 **The human life value approach**

- The amount needed depends on the insured's human life value, which is the present value of the family's share of the deceased breadwinner's future earnings

Amount of Life Insurance to Own

- To calculate the amount needed under the human life value approach:
 - Estimate the individual's average annual earnings over his or her productive lifetime
 - Deduct taxes, insurance premiums and self-maintenance costs
 - Using a reasonable discount rate, determine the present value of the family's share of earnings for the number of years until retirement
 - **Same principle as calculating NPV or firm's value!**

Amount of Life Insurance to Own

- Limitations that understate economic value:
 - Other sources of income are ignored e.g. social security, group insurance received from a company
 - Future uncertainty, e.g. birth of a child, death of a family member, etc.

- Calculator:

Lifehappens.org/human-life-value-calculator/

Amount of Life Insurance to Own

2 **the needs approach**, the amount needed depends on the financial needs that must be met if the family head should die

- The calculation should consider:
 - An estate clearance fund including funeral expenses, uninsured medical bills, installment debts
 - Income needed for a 1-2 year readjustment period
 - Income needed for the dependency period, until the youngest child reaches age 18 (or depending on each culture)

Amount of Life Insurance to Own

- The calculation should consider:
 - Life income to the surviving spouse
 - Especially needed if he/she is out of the labor force for many years
 - If a surviving spouse has a career, the need for life income is greatly reduced or even eliminated
 - Special needs
 - Mortgage redemption fund or educational fund
 - Emergency fund – for unexpected events
 - Retirement needs

How Much Life Insurance Do You Need?

<i>What You Will Need</i>	<i>Jennifer Smith</i>	<i>Your Needs</i>
Cash needs		
Funeral costs	\$ 15,000	\$ _____
Uninsured medical bills	5,000	\$ _____
Installment debts	12,000	\$ _____
Probate costs	3,000	\$ _____
Federal estate taxes	0	\$ _____
State inheritance taxes	0	\$ _____
Total estate clearance fund	\$ 35,000	\$ _____
Income needs		
Readjustment period	24,000	_____
Dependency period	180,000	_____
Life income to surviving spouse	0	_____
Retirement income	0	_____
Total income needs	\$ 204,000	\$ _____
Special needs		
Mortgage redemption fund	200,000	_____
Emergency fund	50,000	_____
College education fund	150,000	_____
Total special needs	\$ 400,000	\$ _____
Total needs	\$ 639,000	\$ _____

Source: RM Exhibit 11.1

How Much Life Insurance Do You Need?

<i>What You Have Today</i>	<i>Jennifer Smith</i>	<i>Your Assets</i>
Checking account and savings	\$ 10,000	\$ _____
Mutual funds and securities	35,000	\$ _____
IRAs and Keogh plan	20,000	
Section 401(k) plan and employer savings plan	40,000	_____
Private pension death benefit	0	_____
Current life insurance	60,000	_____
Other financial assets	0	_____
Total assets	\$ 165,000	_____
Additional life insurance needed		\$ _____
Total needs	\$ 639,000	
Less total assets	165,000	\$ _____
Additional life insurance needed	\$ 474,000	_____
		\$ _____

Amount of Life Insurance to Own

- Internet-based life insurance calculators produce widely-varying results, but may be a good starting point
 - <http://www.lifehappens.org/insurance-overview/life-insurance/calculate-your-needs/>
- Most families own an insufficient amount of life insurance
 - In 2010, only 44% of the households in the U.S. owned any individual life insurance
 - Consumers procrastinate, and have difficulty in making correct decisions about the purchase of life insurance

Amount of Life Insurance to Own

- Many families have only a limited amount of discretionary income
 - They don't even have enough money for basic needs
 - Many families are in debt and have little savings
 - After payment of high priority expenses, such as a mortgage, food and utilities, many families have only a limited amount of income to purchase life insurance

Determining the Cost of Life Insurance

- The cost of a life insurance policy is the difference between what you pay and what you get back
- When determining the cost of life insurance, four major factors must be considered:
 1. Annual premiums
 2. Cash values
 3. Dividends (if any)
 4. Time value of money

Determining the Cost of Life Insurance

- 1 Traditional net cost method - the cash value and expected dividends are subtracted from annual premiums to obtain a net cost per year figure
 - Does **not consider** the time value of money
 - Insurance illustration often showed the insurance to be free (to have a negative cost)

Traditional Net Cost Method

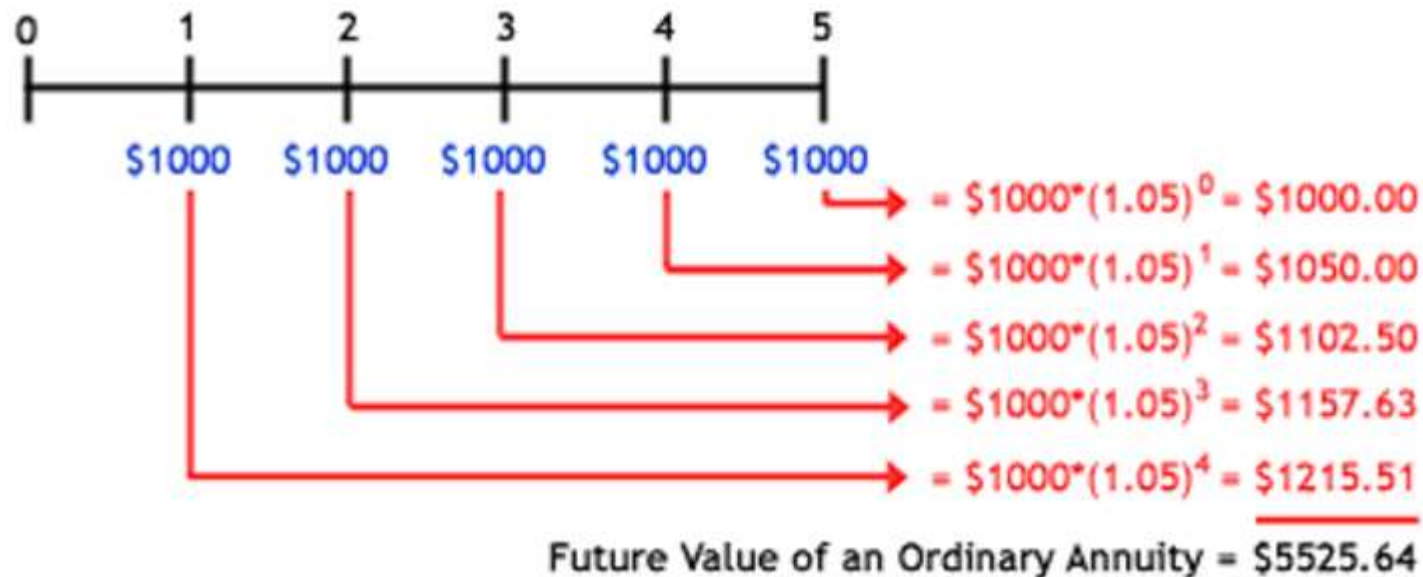
- Assume that the annual premium for a \$10,000 ordinary life insurance policy issued to a female, age 20, is \$132.10
- Estimated dividends over a 20-year period are \$599, and
- The cash surrender value at the end of the twentieth year is \$2,294

Total premiums for 20 years	\$2642
Subtract dividends for 20 years	<u>-599</u>
Net premiums for 20 years	\$2043
Subtract the cash value at the end of 20 years	<u>-2294</u>
Insurance cost for 20 years	-\$251
Net cost per year ($-\$251 \div 20$)	<u>$-\\$12.55$</u>
Net cost per \$1000 per year ($-\$12.55 \div 10$)	<u>$-\\$1.26$</u>

Calculating the PV and FV of Annuities

Future value of an ordinary annuity

- Assume that you are receiving \$1,000 every year for the next 5 years, and you invested each payment at 5%.



Calculating the PV and FV of Annuities

Future value of an ordinary annuity

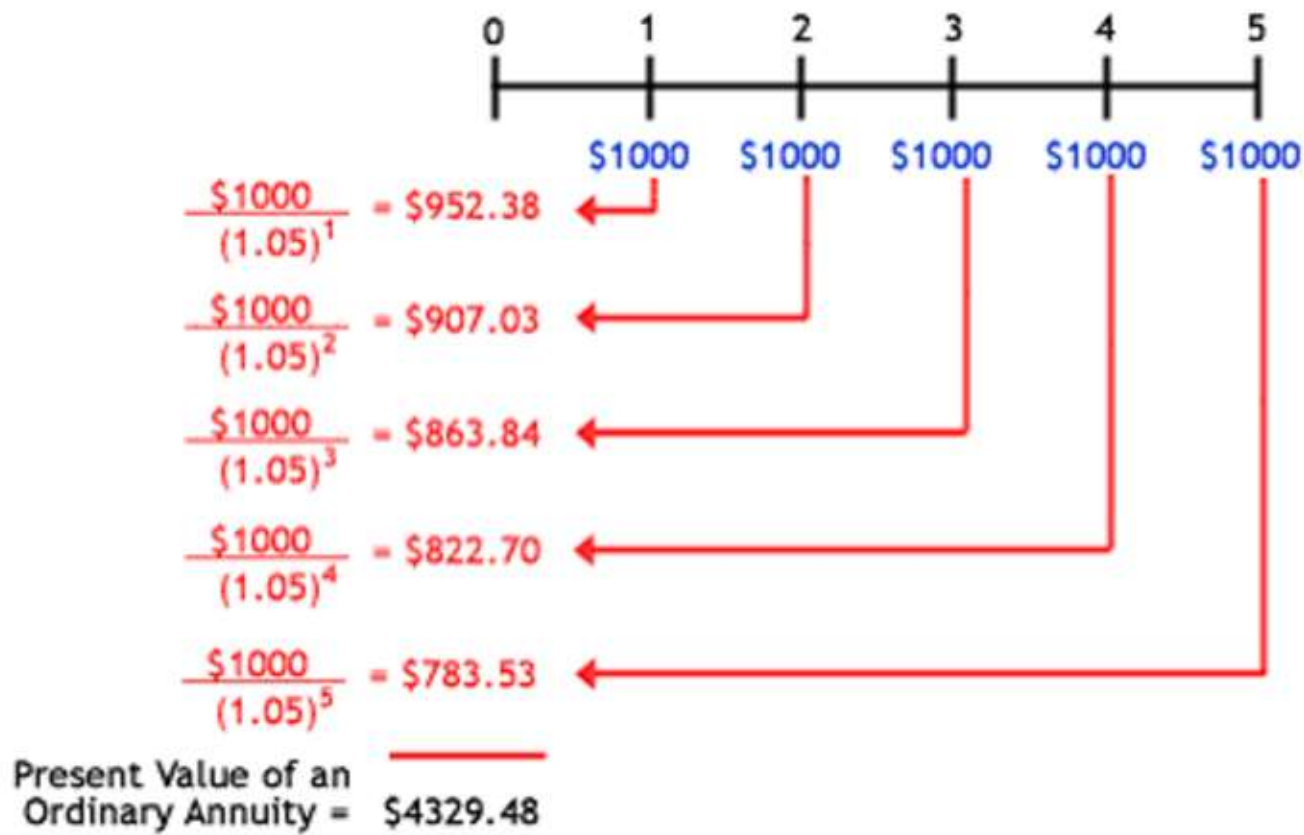
- Assume that you are receiving \$1,000 every year for the next 5 years, and you invested each payment at 5%.

$$FV_{\text{Ordinary Annuity}} = C * \left[\frac{(1+i)^n - 1}{i} \right]$$

$$FV_{\text{Ordinary Annuity}} = \$1000 * \left[\frac{(1+0.05)^5 - 1}{0.05} \right] = \$1000 * [5.53] = \$5525.63$$

Calculating the PV and FV of Annuities

Present value of an ordinary annuity



Calculating the PV and FV of Annuities

Present value of an ordinary annuity

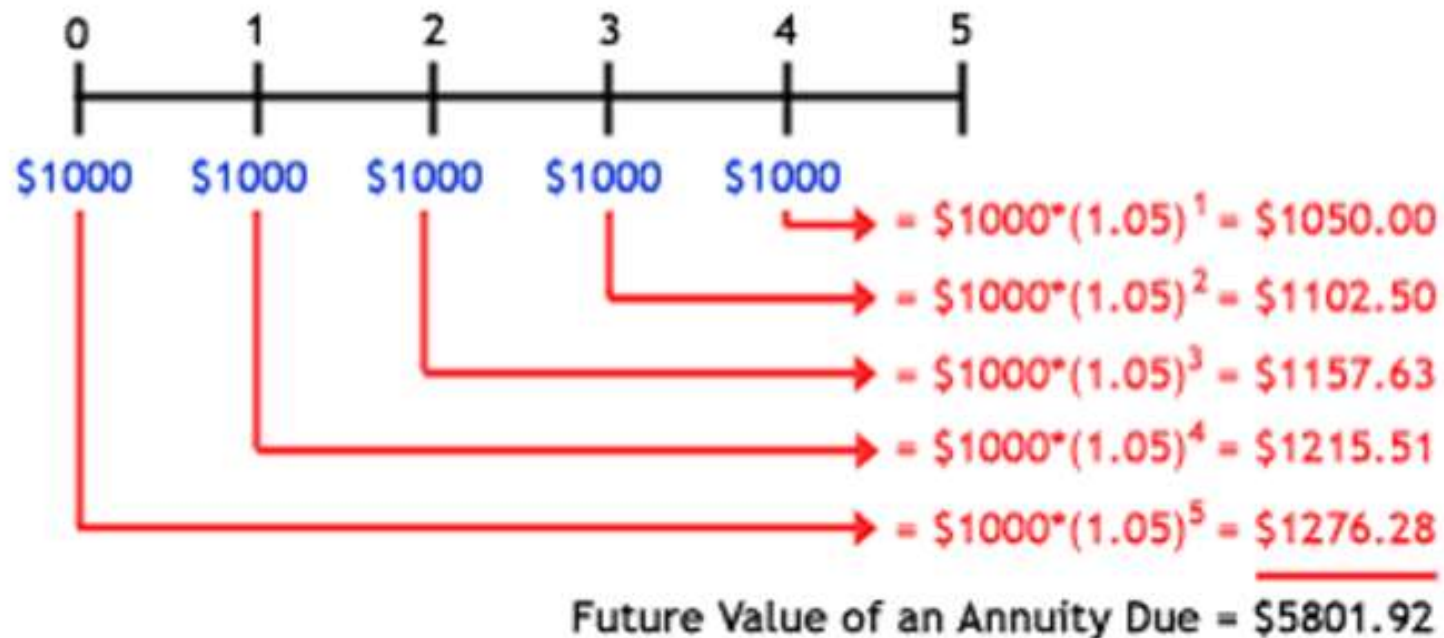
$$PV_{\text{Ordinary Annuity}} = C * \left[\frac{1 - (1 + i)^{-n}}{i} \right]$$

$$PV_{\text{Ordinary Annuity}} = \$1000 * \left[\frac{1 - (1 + 0.05)^{-5}}{0.05} \right] = \$1000 * [4.33] = \$4329.48$$

Calculating the PV and FV of Annuities

Future value of an annuity due

- Each \$1,000 payment is made at the beginning of the period rather than at the end (interest rate is still 5%).



Calculating the PV and FV of Annuities

Future value of an annuity due

- Each \$1,000 payment is made at the beginning of the period rather than at the end (interest rate is still 5%).

$$FV_{\text{Annuity Due}} = C * \left[\frac{(1 + i)^n - 1}{i} \right] * (1 + i)$$

$$FV_{\text{Annuity Due}} = \$1000 * \left[\frac{(1 + 0.05)^5 - 1}{0.05} \right] * (1 + 0.05) = \$1000 * 5.53 * 1.05 = \$5801.91$$

Calculating the PV and FV of Annuities

Present value of an annuity due

$$PV_{\text{Annuity Due}} = C * \left[\frac{1 - (1 + i)^{-n}}{i} \right] * (1 + i)$$

$$PV_{\text{Annuity Due}} = \$1000 * \left[\frac{1 - (1 + 0.05)^{-5}}{0.05} \right] * (1 + 0.05) = \$1000 * 4.33 * 1.05 = \$4545.95$$

Determining the Cost of Life Insurance

- 2 Interest-adjusted cost method is more accurate because it considers the time value of money
 - Interest-adjusted cost indices come in two forms:
 - 2.1 Surrender cost index is useful if the owner expects to surrender the policy after some time period
 - 2.2 Net payment cost index is useful if the owner expects to keep the policy in force

Surrender Cost Index

Total premiums for 20 years, each accumulated at 5%	\$4586
Subtract dividends for 20 years, each accumulated at 5%	-824
Net premiums for 20 years	\$3762
Subtract the cash value at the end of 20 years	-2294
Insurance cost for 20 years	\$1468
Amount to which \$1 deposited annually at the beginning of each year will accumulate to in 20 years at 5%	\$34.719
Interest-adjusted cost per year (\$1468 ÷ \$34.719)	\$42.28
Cost per \$1000 per year (\$42.28 ÷ 10)	\$4.23

Net Payment Cost Index

Total premiums for 20 years, each accumulated at 5%	\$4586
Subtract dividends for 20 years, each accumulated at 5%	-824
Insurance cost for 20 years	\$3762
Amount to which \$1 deposited annually at the beginning of each year will accumulate to in 20 years at 5%	\$34.719
Interest-adjusted cost per year (\$3762 ÷ \$34.719)	\$108.36
Cost per \$1000 per year (\$108.36 ÷ 10)	\$10.84

Determining the Cost of Life Insurance

- Interest-adjusted cost indices can be used to compare policies across insurers
 - There is a wide variation in costs indices across insurers – it pays to shop around! (see next slide)
 - Most consumers use premiums as a basis for comparison, but agents can supply cost indices (in developed markets)
 - Unfortunately, such comparison cannot be found in Thailand (Open for disruption!)

Whole Life Actual Historical Performance \$250,000 Male Nonsmoker Preferred Class, Age 45

20-Year Historical Performance <i>(Policy Issued 12/31/1990. Last Day 12/31/2010)</i>			<i>Year 20 Cash Dividends*</i>			
<i>Company</i>	<i>Leading Policy (12/31/90)</i>	<i>Annual Premium</i>	<i>Surrender Cost Index</i>		<i>Net Payment Index</i>	
			<i>Illustrated</i>	<i>Actual</i>	<i>Illustrated</i>	<i>Actual</i>
Country Financial Life	Executive Whole Life	4,850	-0.99	2.57	9.78	13.34
Guardian Life	Whole Life 100(89-Form)	5,211	-0.82	3.72	10.46	15.00
Massachusetts Mutual Life	Whole Life-MM Block	4,730	0.27	2.95	10.46	13.72
Met Life	Whole Life	4,820	-1.73	2.99	9.10	13.82
Mutual Trust Life	Econolife	4,745	-1.27	4.14	9.36	14.77
New York Life	Whole Life	4,710	-2.28	2.02	8.20	12.50
Northwestern Mutual Life	90 Life	5,815	-0.24	1.59	11.26	13.09
Penn Mutual Life	Traditional Life	5,088	-1.25	3.33	9.35	13.93
Savings Bank Life of MA	Straight Life	4,388	-1.60	-0.24	8.72	10.08
Security Mutual Life of NY	Customizer	4,358	-0.76	3.97	9.36	14.09
State Farm Life	Estate Protector	4,708	-0.14	3.69	9.97	13.81
Thrivent Financial for Lutherans	Life Paid-Up at 65 (L65)	7,235	-3.92	2.42	13.65	19.99
Thrivent Financial for Lutherans	Life Paid-Up at 96 (L96)	5,103	-1.17	2.82	10.29	14.29

*Best class at least 15% of this policy issued

SOURCE: Adapted from Roger L. Blease, "Full Disclosure Whole Report," *National Underwriter*, Life & Health Magazine, May 17, 2010.

Determining the Cost of Life Insurance

- The life insurance policy illustration usually presents information to applicants to reduce misunderstanding of policy values by policyowners, and reduce deceptive sales practices by agents
- Information includes:
 - A narrative summary describes the basic characteristics of the policy
 - A numeric summary shows the premium outlay, value of the accumulation account, cash surrender values and death benefit

Rate of Return on Saving Component

- 1 The IRR method is based on a formula:
 - This method is simple but does not take into account of protection element, implying that the IRR we receive from this method is too low
 - We can adjust by adding protection element using the benchmark price table or mortality table

Rate of Return on Saving Component

- 2 The yearly rate of return method is based on a formula:

$$\frac{\left(\begin{array}{l} \text{amount available in the policy} \\ \text{at the end of the policy year} \end{array} \right) + \left(\begin{array}{l} \text{assumed price of the} \\ \text{protection component} \end{array} \right)}{\left(\begin{array}{l} \text{amount available in the policy} \\ \text{at the beginning of the policy year} \end{array} \right)} - 1$$

- The information needed for the calculation is readily available to consumers incl. premium, expected dividends, cash surrender value, and cost of insurance

Benchmark Prices

<i>Age</i>	<i>Benchmark Price</i>
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

NOTE: The benchmark prices are derived from certain U.S. population death rates. The benchmark figure for each five-year age bracket is close to the death rate per \$1000 at the highest age in that bracket.

SOURCE: Adapted from Joseph M. Belth, *Life Insurance: A Consumer's Handbook*, 2nd ed. (Bloomington, IN: Indiana University Press, 1985), table 9, p. 84. Reprinted by permission of the author.

Example

- Mark purchased a \$100,000 participating ordinary life policy at age 35
- Now he is 42 at the beginning of the 8th policy year
- The annual premium is \$1,500
- The cash value is \$7,800 at the end of 7th policy year and \$9,200 at the end of 8th policy year
- The 8th year dividend is \$400

Calculate the yearly rate of return for the 8th policy year

Taxation of Life Insurance - Thailand

(6) ค่าเบี้ยประกันสุขภาพบิดามารดาของผู้มีเงินได้และคู่สมรส สามารถหักลดหย่อนได้ตามที่จ่ายจริง แต่ไม่เกิน 15,000 บาท บิดามารดาต้องไม่มีเงินได้พึงประเมินในปีภาษีที่ขอหักลดหย่อนเกิน 30,000 บาทขึ้นไป

(7) ค่าเบี้ยประกันชีวิต

(7.1) ค่าเบี้ยประกันชีวิต สามารถหักลดหย่อนและยกเว้นได้ตามที่จ่ายจริง แต่ไม่เกิน 100,000 บาท และของคู่สมรสที่ไม่มีเงินได้ สามารถหักลดหย่อนได้ตามที่จ่ายจริง แต่ไม่เกิน 10,000 บาท (ค่าเบี้ยประกันชีวิตต้องมีความคุ้มครองตั้งแต่ 10 ปีขึ้นไป และผลประโยชน์ตอบแทนคืนไม่เกินร้อยละ 20 ของเบี้ยประกันชีวิตรายปี แต่ค่าเบี้ยประกันความคุ้มครองอื่น เช่น คุ้มครองสุขภาพ หรือคุ้มครองอุบัติเหตุไม่สามารถหักลดหย่อนได้)

(7.2) ค่าเบี้ยประกันชีวิตแบบบำนาญของผู้มีเงินได้หักลดหย่อนได้ในอัตราร้อยละ 15 ของเงินได้ที่นำมาเสียภาษีเงินได้ในแต่ละปี แต่ไม่เกิน 200,000 บาท (เป็นค่าเบี้ยประกันชีวิตแบบบำนาญ ความคุ้มครองตั้งแต่ 10 ปีขึ้นไป และจ่ายผลประโยชน์เงินบำนาญเมื่อผู้มีเงินได้อายุตั้งแต่ 55 ปีขึ้นไปถึงอายุ 85 ปีหรือกว่านั้น และเมื่อรวมกับเงินสะสมเข้ากองทุนสำรองเลี้ยงชีพ + เงินสะสมเข้ากองทุนบำเหน็จบำนาญข้าราชการ + เงินสะสมเข้ากองทุนสงเคราะห์ตามกฎหมายว่าด้วยโรงเรียนเอกชน + เงินที่ซื้อหน่วยลงทุนในกองทุนรวมเพื่อการเลี้ยงชีพ + เงินสะสมเข้ากองทุนการออมแห่งชาติ ต้องไม่เกิน 500,000 บาท)

(13) เงินสมทบกองทุนประกันสังคม หักลดหย่อนได้ตามที่จ่ายจริง ตามกฎหมายว่าด้วยการประกันสังคม

Shopping For Life Insurance

