FN241: Session 9
Life Insurance and Liability Risk

Winai Homsombat

Bachelor of Economics, International Program

Thammasat University

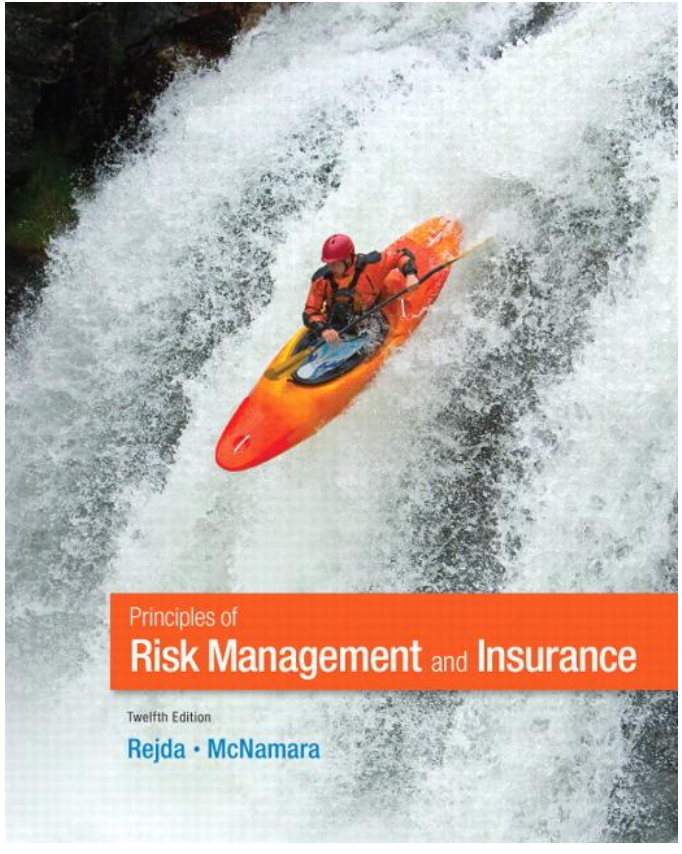
Reading

George, E. Rejda, and Michael McNamara,

"*Principal of Risk Management and Insurance*",

Pearson; 12th Edition (2013).

Chapter: 11 and 19



Life Insurance

Agenda

- Premature Death
- Amount of Life Insurance to Own
- Types of Life Insurance

Premature Death

- The death of a family head with outstanding unfulfilled financial obligations can cause serious financial problems for the surviving family members
- Life expectancy has increased significantly over the past century
- The purchase of life insurance is financially justified if the insured has earned income and others are dependent on those earnings for financial support

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
- To calculate:
  - 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

Amount of Life Insurance to Own

(1) The human life value approach

Example: Assume that Richard, age 27, is married and has two children. He earns $50,000 annually and plans to retire at age 67. (For the sake of simplicity, assume that his earnings remain constant.) Of this amount, $20,000 is used for federal and state taxes, life and health insurance, and Richard's personal needs. The remaining $30,000 is used to support his family. How much is Richard's human life value?

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
- Important family needs must consider:
  - An **estate clearance fund**: cash needed for burial expenses, uninsured medical bills, and taxes
  - Income needed for the **readjustment period**, a 1-2 year period in which the family adjusts to its new living standard
  - The **dependency period** is the period until the youngest child reaches age 18
  - Life income to the surviving spouse, including income during and after the blackout period. The **blackout period** refers to the period from the time that Social Security survivor benefits terminate to the time the benefits are resumed
  - Families should also consider special needs, e.g., funds for college education and emergencies

Amount of Life Insurance to Own

(2) The needs approach

What You Will Need	*Jennifer Smith*		*Your Needs*	
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		$

What You Have Today	*Jennifer Smith*		*Your Assets*	
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

(3) The capital retention approach

- This approach preserves the capital needed to provide income to the family
  - Income-producing assets are preserved for the heirs
- To calculate:
  - Prepare a **personal balance sheet**
  - Determine the amount of **income-producing capital**
  - Determine the amount of **additional capital needed** to meet the family needs

Amount of Life Insurance to Own

(3) The capital retention approach

Example: Kevin, age 35, has a wife and two children, ages 3 and 5. Kevin earns $60,000 annually. If he should die, he wants his family to receive $40,000 annually.

Personal balance sheet

Assets	
House	$225,000
Automobiles	20,000
Personal and household property	40,000
Securities and investments	60,000
Checking account	5,000
Individual and group life insurance	200,000
401(k) plan	70,000
Total	$620,000
Liabilities	
Mortgage	$100,000
Auto loan	10,000
Credit cards	5,000
Total	$115,000

Income-producing capital

Total assets	$620,000
Less:	
Mortgage payoff	$100,000
Auto loan and credit card debts	15,000
Final expenses	15,000
Emergency fund	50,000
Educational fund	100,000
Non-income-producing assets (automobiles, personal and household property, value of home)	285,000
Total deductions	565,000
Capital now available for income	$ 55,000

Additional capital needed

Income objective for family	$ 40,000
Less:	
Income from capital now available ($55,000 × 5%)	–2,750
Social Security survivor benefits	–13,000
Income shortage	$ 24,250
Total new capital required ($24,250/.05)	$485,000

Types of Life Insurance

- Life insurance policies can be classified in two general categories:
  - Term insurance provide temporary protection
  - Cash-value life insurance has a savings component and builds cash values
- There are many variations of both types available today

Types of Life Insurance

(1) Term Life Insurance policy = protection is temporary

- Protection expires at the end of the policy period, unless renewed
- Most term policies are **renewable** for additional periods
  - Premiums increase at each renewal
- Most term policies are **convertible**, which means the policy can be exchanged for a cash-value policy without evidence of insurability
  - Under the **attained-age method**, the premium charged for the new policy is based on the insured's attained age at the time of conversion
  - Under the **original-age method**, the premium charged for the new policy is based on the insured's original age when the term insurance was first purchased

Examples of Term Life Insurance Premiums

$500,000 Term Life Insurance

Female Annual Premiums					
Age	10 Year	15 Year	20 Year	25 Year	30 Year
30	$ 140	$ 190	$ 225	$ 320	$ 365
35	$ 145	$ 195	$ 230	$ 375	$ 415
40	$ 195	$ 260	$ 315	$ 505	$ 525
45	$ 295	$ 375	$ 480	$ 785	$ 825
50	$ 435	$ 520	$ 665	$ 1,055	$ 1,095
55	$ 645	$ 730	$1,070	$ 1,670	$ 2,700
60	$ 950	$1,255	$1,745	$ 2,845	$ 6,170
65	$1,550	$2,030	$3,130	$ 7,740	$ 7,950
70	$2,425	$3,885	$5,845	$10,990	$10,990

Male Annual Premiums					
Age	10 Year	15 Year	20 Year	25 Year	30 Year
30	$ 140	$ 195	$ 230	$ 320	$ 415
35	$ 145	$ 195	$ 255	$ 375	$ 465
40	$ 200	$ 260	$ 340	$ 560	$ 680
45	$ 295	$ 455	$ 585	$ 855	$ 1,110
50	$ 450	$ 690	$ 955	$ 1,390	$ 1,990
55	$ 685	$1,025	$1,470	$ 2,765	$ 4,705
60	$1,110	$1,710	$2,535	$ 5,735	$ 7,645
65	$1,920	$3,360	$4,970	$10,045	$10,045
70	$4,440	$5,555	$9,540	$13,140	$13,140

SOURCE: Insure.com

Types of Life Insurance

(1) Term Life Insurance policy: Uses and Limitations of Term Life Insurance

- Term insurance is appropriate when:
  - The amount of income that can be spent on **life insurance is limited**
  - The need for **protection is temporary**
  - The insured wants to guarantee **future insurability**
- However,
  - Term insurance premiums **increase with age** at an increasing rate and eventually reach prohibitive levels
  - Term insurance is inappropriate if you **wish to save money** for a specific need

Types of Life Insurance

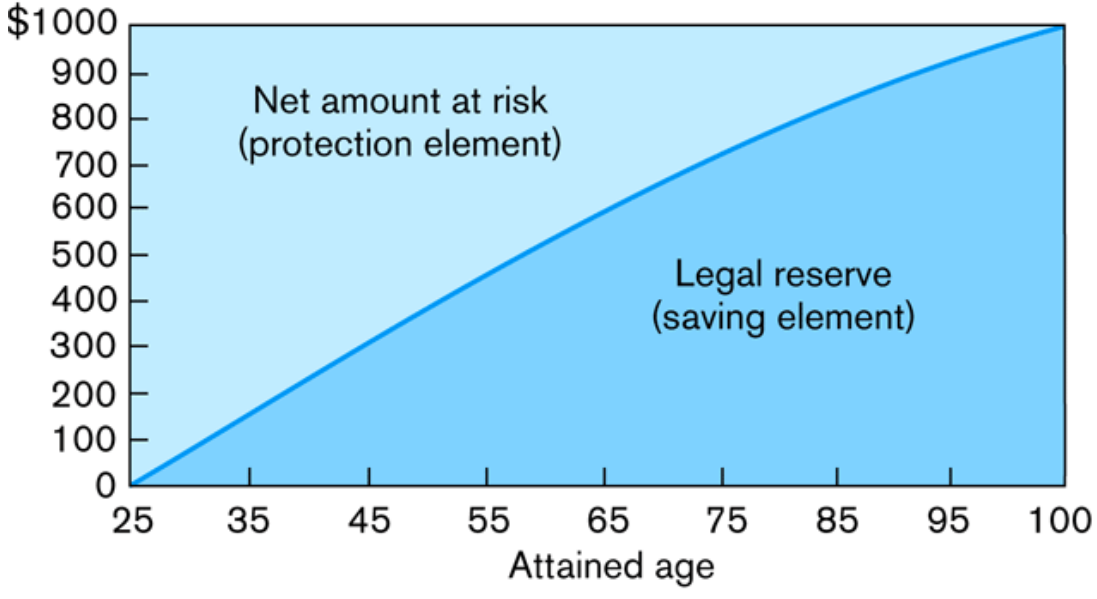
- Whole life insurance is a cash value policy that provides lifetime protection
  - A stated amount is paid to a designated beneficiary when the insured dies, regardless of when the death occurs
  - Types include:
    - Ordinary life
    - Limited-payment life
    - Endowment insurance
    - Variable life
    - Universal life
    - Variable universal life
    - Current assumption whole life
    - Indeterminate-premium whole life

Types of Life Insurance

(2) Ordinary life insurance is a level-premium policy that provides lifetime protection

- **Premiums are level** throughout the premium paying period
- The **excess premiums** paid during the early years are used to supplement the inadequate premiums paid during the later years of the policy. It is referred to as a **legal reserve**
- The insurer's legal reserve is a liability that must be offset by sufficient financial assets
- The **net amount at risk** is the difference between the legal reserve and the face amount of coverage

Relationship Between the Net Amount at Risk and Legal Reserve (1980 CSO Mortality Table)



- Another characteristic of ordinary life insurance policies is the accumulation of cash surrender values
- An ordinary life policy is appropriate when lifetime protection is needed

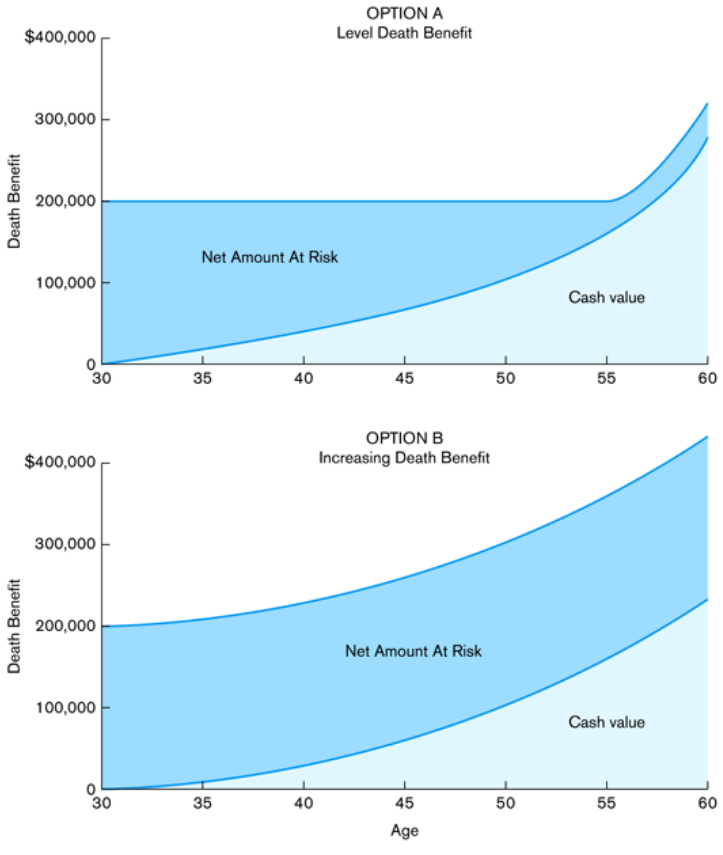
Types of Life Insurance

(3) Variable life insurance is a fixed-premium policy in which the death benefit and cash values ***vary*** according to the investment experience of a separate account maintained by the insurer

(4) Universal Life Insurance is a flexible premium policy that provides lifetime protection

- After the first premium, the policyholder decides the amount and frequency of payments
  - Most policies have a target premium, but the policyowner is ***not obligated*** to pay it
- The protection and savings components are unbundled
  - the policyholder's statement shows the premiums paid, death benefit, and value of the cash value account
  - It also shows the mortality charge and the interest credited to the cash value account

Exhibit: Universal life insurance



- There are two forms of universal life insurance:
  - **Option A** pays a level death benefit during the early years
    - The death benefit increases in later years to meet the corridor test required by the Internal Revenue Code
  - **Option B** provides for an increasing death benefit
    - The death benefit is equal to a constant net amount at risk plus the accumulated cash value

Example: Whole Life Insurance

Example: Assume that Jason, age 25, buys a universal life policy with a level death benefit of $100,000. The annual planned premium is $445.

Each premium is subject to a 5 percent premium expense charge. The policy has a monthly administrative charge of $6. The policy provides for a maximum mortality charge, but the current mortality charge is only about two-thirds of the maximum rate. The policy has a guaranteed interest rate of 4.5 percent and a current interest rate of 5.5 percent that is not guaranteed.

Annual premium	$445
Less:	
Premium expense charges	−22
Administrative charges	−72
Mortality cost	−113
	$238
Interest at 5.5 percent	+13
Cash value account end of year	$251

Example: $100,000 Universal Life Policy, Level Death Benefit, Male Age 25, Nonsmoker, 5.5 Percent Assumed Interest

			Guaranteed Values			Nonguaranteed Projected Values		
Age	Year	Premium Outlay	Death Benefit	Cash Value	Cash Surrender Value	Death Benefit	Cash Value	Cash Surrender Value
26	1	$445.00	$100,000	$222	$0	$100,000	$251	$0
27	2	445.00	100,000	454	0	100,000	516	0
28	3	445.00	100,000	698	140	100,000	796	238
29	4	445.00	100,000	953	395	100,000	1,092	534
30	5	445.00	100,000	1,219	661	100,000	1,392	834
31	6	445.00	100,000	1,498	991	100,000	1,709	1,202
32	7	445.00	100,000	1,788	1,331	100,000	2,041	1,584
33	8	445.00	100,000	2,079	1,673	100,000	2,393	1,987
34	9	445.00	100,000	2,383	2,028	100,000	2,764	2,409
35	10	445.00	100,000	2,689	2,385	100,000	3,143	2,839
36	11	445.00	100,000	2,994	2,740	100,000	3,542	3,288
37	12	445.00	100,000	3,300	3,097	100,000	3,964	3,761
38	13	445.00	100,000	3,609	3,457	100,000	4,396	4,244
39	14	445.00	100,000	3,919	3,818	100,000	4,853	4,752
40	15	445.00	100,000	4,232	4,181	100,000	5,323	5,272
41	16	445.00	100,000	4,557	4,557	100,000	5,832	5,832
42	17	445.00	100,000	4,872	4,872	100,000	6,369	6,369
43	18	445.00	100,000	5,190	5,190	100,000	6,924	6,924
44	19	445.00	100,000	5,495	5,495	100,000	7,509	7,509
45	20	445.00	100,000	5,790	5,790	100,000	8,114	8,114
46	21	445.00	100,000	6,069	6,069	100,000	8,739	8,739
47	22	445.00	100,000	6,325	6,325	100,000	9,376	9,376
48	23	445.00	100,000	6,568	6,568	100,000	10,025	10,025
49	24	445.00	100,000	6,785	6,785	100,000	10,687	10,687
50	25	445.00	100,000	6,976	6,976	100,000	11,363	11,363
51	26	445.00	100,000	7,133	7,133	100,000	12,052	12,052
52	27	445.00	100,000	7,242	7,242	100,000	12,729	12,729
53	28	445.00	100,000	7,280	7,280	100,000	13,390	13,390
54	29	445.00	100,000	7,241	7,241	100,000	14,033	14,033
55	30	445.00	100,000	7,106	7,106	100,000	14,668	14,668
56	31	445.00	100,000	6,866	6,866	100,000	15,282	15,282
57	32	445.00	100,000	6,498	6,498	100,000	15,873	15,873
58	33	445.00	100,000	5,981	5,981	100,000	16,445	16,445
59	34	445.00	100,000	5,282	5,282	100,000	16,989	16,989
60	35	445.00	100,000	4,370	4,370	100,000	17,483	17,483
61	36	445.00	100,000	3,562	3,562	100,000	18,111	18,111
62	37	445.00	100,000	2,567	2,567	100,000	18,723	18,723
63	38	445.00	100,000	1,362	1,362	100,000	19,298	19,298
64	39	445.00	0*	0	0	100,000	19,839	19,839
65	40	445.00				100,000	20,322	20,322
66	41	445.00				100,000	20,819	20,819
67	42	445.00				100,000	21,233	21,233
68	43	445.00				100,000	21,570	21,570
69	44	445.00				100,000	21,824	21,824
70	45	445.00				100,000	21,951	21,951
71	46	445.00				100,000	21,915	21,915
72	47	445.00				100,000	21,721	21,721
73	48	445.00				100,000	21,327	21,327
74	49	445.00				100,000	20,695	20,695
75	50	445.00				100,000	19,772	19,772
76	51	445.00				100,000	18,478	18,478
77	52	445.00				100,000	16,780	16,780
78	53	445.00				100,000	14,574	14,574
79	54	445.00				100,000	11,770	11,770
80	55	445.00				100,000	8,215	8,215
81	56	445.00				100,000	3,685	3,685
82	57	445.00				0*	0	0

NOTE: This illustration assumes that the nonguaranteed projected values currently illustrated will continue unchanged for all years shown. This is not likely to occur, and actual results may be more or less favorable. Projected values are based on nonguaranteed elements that are subject to change. Guaranteed values are based on a guaranteed interest rate of 4.5 percent. Projected values are based on a current interest rate of 5.5 percent. Premiums are assumed to be paid at the beginning of the year. Benefits, cash values, and ages are shown at the end of the year.

*Coverage will terminate under current assumptions. Additional premiums would be required to continue coverage.

Types of Life Insurance

(4) Universal Life Insurance

- Universal life provides considerable **flexibility**
  - Cash withdrawals are permitted
  - Policies receive favorable federal income tax treatment
- Limitations of universal life policies include:
  - Insurers advertise **misleading rates of return** – Gross Rate vs. Net Rate
  - Cash-value and premium-payment projections based on **higher interest rates** are misleading and invalid
  - Insurers can **increase the current mortality** charge to recoup expenses
  - A policy may lapse because some policyowners do not have **a firm commitment** to pay premiums

Types of Life Insurance

(5) Variable universal life is an important variation of whole life insurance

- Most are sold **as investments**
- Similar to universal life except that:
  - The policy owner decides how the premiums are invested
  - The policy does not guarantee a minimum interest rate or minimum cash value
- These policies have relatively **high expense charges**, including front-end loads for sales commissions, back-end surrender charges, and investment management fees

Types of Life Insurance

(6) Current assumption whole life insurance is ***a nonparticipating whole life policy*** in which the cash values are based on the insurer's current mortality, investment, and expense experience

- An accumulation account reflects the cash value under the policy
- If the policy is surrendered, a surrender charge is deducted from the accumulation account
- A guaranteed interest rate and current interest rate are used to determine cash values
- A fixed death benefit and maximum premium level at the time of issue are stated in the policy
- Two forms of current assumption whole life products:
  - Low-premium products, with a low initial premium
  - High-premium products, with a vanishing premium provision

Comparison of Major Life Insurance Contracts

	Term Insurance	*Ordinary Life Insurance*	*Variable Life Insurance*	*Universal Life Insurance*	*Variable Universal Life Insurance*	*Current Assumption Whole Life Insurance*
Death benefit paid	Level or decreasing death benefit	Level death benefit	Guaranteed minimum death benefit plus increased amount from favorable investment returns	Either level or an increasing death benefit	Either level (option A) or variable based on investment returns (option B)	Level death benefit
Cash value	No cash value	Guaranteed cash values	Cash value depends on investment performance (not guaranteed)	Guaranteed minimum interest rate plus excess interest credited to the account	Cash value depends on investment performance (not guaranteed)	Guaranteed minimum cash value plus excess interest credited
Premiums paid	Premiums increase at each renewal	Level premiums	Fixed-level premiums	Flexible premiums	Flexible premiums	Premiums paid may vary based on insurer experience; guaranteed maximum premium
Policy loans	No	Yes	Yes	Yes	Yes	Yes
Partial withdrawal of cash value	No	No	Permitted in some policies	Yes	Yes	Yes
Surrender charge	No	No explicit charge stated (reflected in cash values)	Yes	Yes	Yes	Yes

Liability Risk and Insurance

Basis of Legal Liability

- A legal wrong is a violation of a person's legal rights, or a failure to perform a legal duty owed to a certain person or to society as a whole
- Legal wrongs include:
  - Crime
  - Breach of contract
  - Tort

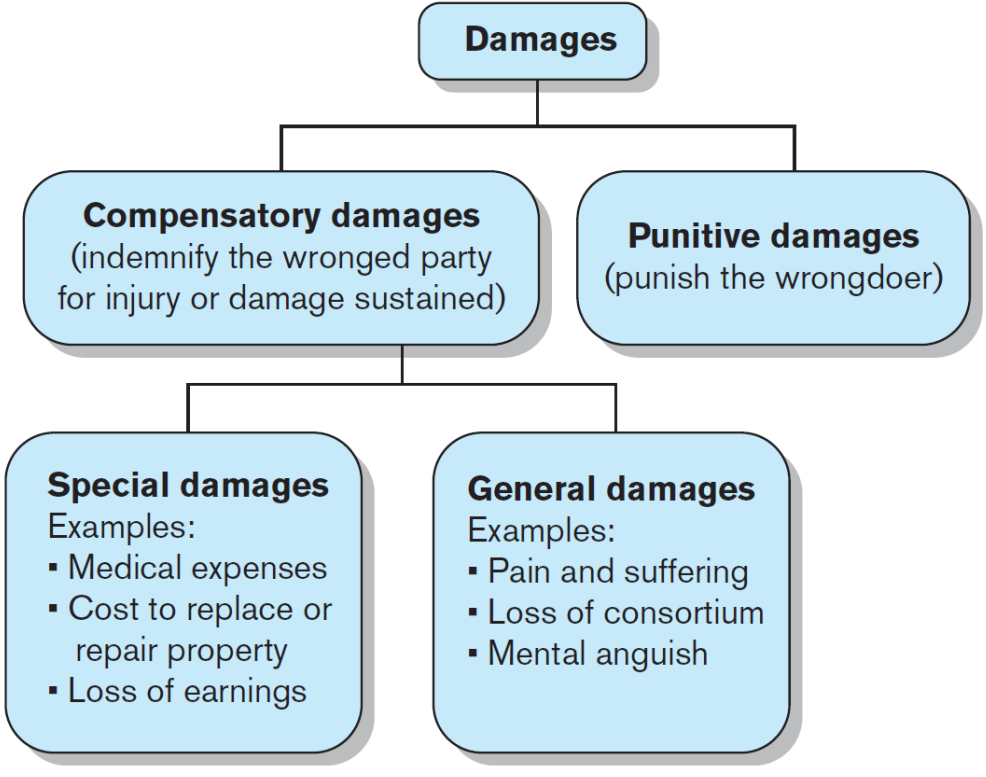
Basis of Legal Liability

- A tort is a legal wrong for which the court allows a remedy in the form of money damages
- The person who is injured (plaintiff) by the action of another (tortfeasor) can sue for damages
- Torts fall into three categories:
  - Intentional, e.g., fraud, assault
  - Strict liability: liability is imposed regardless of negligence or fault
  - Negligence

Law of Negligence

- **Negligence** is the **failure to exercise the standard of care** required by law to protect others from an unreasonable risk of harm
  - The standard of care is not the same for each wrongful act. It is based on the care required of a reasonably prudent person
- **Elements Negligence**
  - Existence of a legal duty to use reasonable care
  - Failure to perform that duty
  - Damage or injury to the claimant
  - Proximate cause relationship between the negligent act and the infliction of damages must exist.

Law of Negligence



- The law allows for the following types of damages:
  - Compensatory damages compensate the victim for losses actually incurred. They include:
    - Special damages, e.g., medical expenses
    - General damages, e.g., pain and suffering
  - Punitive damages are designed to punish people and organizations so that others are deterred from committing the same wrongful act
- The ability to collect damages for negligence depends on state law

Example of Liability Insurance

- Errors & Omissions (E&O) Liability Insurance
- Employer’s liability and workers' compensation
- Product liability insurance
- Commercial liability insurance
- etc.

Question?