CHAPTER 7

Definition of Insurance

- Insurance provides indemnification against loss or liability from specified events and circumstances which may occur or be discovered during a specific period (FASB113)
- The essence of insurance if the transfer of risk from the insured to one or more insurers
- Insurance companies are financial intermediaries who collect premiums and invest them in securities and other financial assets

Insurance Policy: benefit provided by a particular kind of indemnity contract
Insurer: issued by one of several kids of legal entities
Policyholder or Insured: in which the insurer promises to pay on behalf of or to indemnify another party
Insurance premium: that protects the insured against loss caused by those perils subject to the indemnity in exchange for consideration

Fundamentals of Insurance → seven basic principles all insurance companies are subject to

1. There must be a relationship between the insured and the beneficiary
    a. The beneficiary must be someone who would suffer if it weren't for the insurance
    b. "Insurable Interest" : the right of the policyholder to effect insurance, arising out of a certain relationship that may exist between the policyholder and the subject matter insured.
    c. Without insurable interest, insurance protection wortul dbe speculative in nature and not be enforceable under the law
2. The insured must provide full and accurate information to the insurance company
    a. "Principle of Utmost Good Faith" : the insurer trust the policyholder to give precise and true details of the subject matter to be insured
3. The insured is not to profit as a result of insurance coverage
    a. "Principle of Indemnity" : an insurance policy compensates the policyholder only to the extent of the value of the property which he has lost, hence a policyholder should not expect to make any profit for the claim
4. If a third party compensates the insured for the loss, the insurance companies obligation is reduced by the amount of compensation
    a. For policies to which indemnity applies, the purchase of several policies to cover the same subject matter will not result in the obtaining of claims payments of several times the value of the subject matter. The insurers simply contribute to make up the amount payable as if only one policy was issued
5. Large number of homogeneous exposure units
    a. The insurance company must have a large number of insured so that the risk can be spread among many different policies
    b. "Law of Large Number" : when many people are insured, the probability distribution of the losses will assume a normal probability distribution which allows accurate predictions
6. Calculable loss: the loss must the quantifiable
    a. For example : an oil company could not buy a policy on an unexplored oil field
7. The insurance company must be able to compute the probability of the loss occurring

Why get Insured?

- Premiums are likely to be more than the expected loss
- If there is no insurance, need to set aside reserves for losses, reserves cannot be invested long term as need to be immediately accessible in case of loss (liquidity) → low return, worry that level or reserved may not be adequate to cover the loss
- Most people are risk-averse : they would rather pay a certainty equivalent (the insurance premium) than accept the gamble that they will lose their house/car → insurance allows a peace of mind that a single event can have only a limited financial impact
- Trade-off : cost of premium vs. probability of occurrence and likely loss

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Adverse Selection and Moral Hazard in Insurance	
Adverse Selection - Which policies to accept	Moral Hazard - When the insured fails to take proper precautions (or takes on more risk) to avoid losses because losses are covered by insurance policy
Solutions - Screening and fraud prevention investigations - Health insurance policies require a physical exam - Pre Existing condition may be excluded from the policy	Solution - Insurance companies use co-insurance, deductibles and restrictive provisions to help control this problem
A deductible is the amount of any loss that must be paid by the insure before the insurance company will be paying anything	

How do insurance companies make profit?

Profit = earned premium + investment income - incurred loss - underwriting expenses

Insurers make money in two ways

1. Underwriting : the process by which insurers select the risk to insure and decide how much in premiums to charge for accepting those risks
    a. An insurer's underwriting performance is measured in its combined ratio which is the ratio of losses and expenses to premiums. A combined ratio <100% indicates underwriting profitability, which anything over 100 indicates an underwriting loss. A company with combined ratio over 100% may nevertheless be profitable due to investment earnings
2. Investing : the premiums they collect from insured parties
    a. Insurance companies earn investment profits on "float"
    b. Float : or available reserve is the amount of money, at hand at any given moment, that an insurer has collected in insurance premiums but has not paid out on claims

Insurance Industry Organization

1. Distribution
    a. Independent agents may sell the insurance products of a number of different insurance companies
    b. Exclusive (captive) agents only sell the products of one company
    c. Nowadays most insurance companies use multip[le distribution channels, including banks, professional organizations and market places
    d. In the US, since 1999 other financial institutions have started competing directly with insurance companies to provide insurance services (eg. Bancassurance)
2. Underwriting : reviews each policy prior to its acceptance to determine if the risk is acceptable
3. Claims
    a. Claim adjuster : undertakes a thorough investigation of each claim, usually in close cooperation with the insured, determines if coverage is available under the terms of the insurance contact, and if so, the reasonable monetary value of the claim and authorizes payment

3. Pension Reform Act of 1978 authorized individual retirement accounts (IRAs)
    a. Enjoy a preferential tax treatment
    b. Keogh plans are similar plans for self-employed individuals
    c. SIMPLE IRAs are simplified retirement plans for small businesses
4. Pension Protection Act 2006 (17 August)
    a. Strengthens the federal pension insurance system
    b. Allows companies to phase out their Traditional Defined Benefit or other pension plan and automatically enroll employees in 401(k) plans, as well as set investment guidelines
    c. Makes permanent tax breaks or retirement plans and accounts which were scheduled to expire in 2010 permanent
    d. Gives taxpayers the option of direct depositing portions of their tax refunds into IRAs
    e. Permits 401(k) and similar plans to offer investment advice
    f. Gived employers seven years to fully fund their plans (some airlines in bankruptcy proceedings for 10 years)

Retirement Product Convergence: Annuities
- There are several types of annuities: deferred/immediate and fixed/variable
- Annuities are typically sold by insurance companies

Pension Funds in HK: the Mandatory Provident Fund
- Established 1 December 2000, Privately manager, employment related scheme
- Regulation: MPFS Ordinance August 1995
- Regulator: MPFSA (Mandatory provident Fund Schemes Authority) set up in September 1998

Mandatory - Employees (>60 days continues employment) have to contribute 5% of their wages to MPF; contributions are matched by employers (total 10%)	Contributions not available until retirement age (65) Portable plan - When changing jobs, employee can transfer to new employer plan to own MPF
Members choice - Means employee can choose where contributions are invested, within the array of choices available under the plan	Trustee set-up - MPF funds must be in a trust structure to ensure maximum protection to scheme members assets

Pensions in HK: Regulatory Structure

Government of Hong Kong			
MPF Schemes Authority			
MPF Schemes			Occupational Retirement Schemes - Before the MPF was launched in 2000, retirement schemes set up voluntarily by employee for their employees were regulates under the Occupational Retirement Schemes Ordinance (ORSO)
MPF Trustees	MPF Intermediaries (in coordination with HKMA, Insurance Authority and Securities and Future Commission)	MPF Schemes and Products (in coordination with Securities and Futures Commision)	

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The MPFA is now responsible for regulating both MPF schemes and ORSO schemes, under the MPFSO and the ORSO respectively

MPF Structure: Constituent Funds

ABC MPF Master Trust • Employer selects the master trust				
Constituent Fund A: Capital Preservation Product	Constituent Fund B	Constituent Fund C	Constituent Fund D	
	Direct investment in shares and/or bonds, etc	Apif : approved pooled investment funds can be a unit trust or a insurance policy	Apif	Apif

Employee Choice Agreement
- Started on 1 November 2012. Employees are allowed to transfer their accrued benefits, eg. the accumulated contribution and investment returns, which arouse from the employee mandatory contributions made during their current employment to another MPF trustee and scheme of their own choice once every calendar year; or not to make any change by retaining the accrued benefits in the MPF scheme they are currently enrolled in
- In addition, the minimum and maximum levels of relevant income have been adjusted to HKD 7,100 and HKD 30,000 respectively (as of October 2014)

Withdrawal Choice Arrangement
- Introduction of choice of withdrawal by installment instead of lump sum (effective 1 Feb 2016) : Scheme members who have reached the age of 65, or who have reached the age of 60 and have decided to early retire can choose to either:
    - Withdraw their MPF benefits by installment
    - Withdraw their MPF benefits in lump sum
    - Retain all their MPF benefits in their accounts for continuous investment

Default Investment Strategy
- To address the problems of high feed and difficulty in making choices associated with some MPF schemes, the Government and the MPFA propose to require each trustee to provide : Default Investment Strategy (DIS)
- The government introduced the amendment bill to the legislative council on 25 November 2015, and then was launched by the end of 2016
- MPF Members who don't select any options will be default contribute into the DIS

Unit Trusts vs. Mutual Funds

	Unit Trusts	Mutual Funds
Form of establishment	Trust	Limited liability company
Beneficiary	Unit holder	Shareholder
Governing law	Trust law	Company law
Legal document in which the rules are laid down	Trust deed	Company's Articles/bylaws and custodian agreements
Who protects investors interests	Trustee	Custodian (but accordion to the custodian agreement and articles/bylaws)
Who own or holds the fund assets	Trustee holds the assets for the benefit of the investors	The mutual fund company own the asset and investors are shareholders of the company
Who is liable	Trustee	The company has limited liability; directors can be liable

Types of Mutual Funds

Mutual Funds	
Short Term	Medium/Long Term
Taxable MMF, Tax-Exempt MMMF	Bond Funds, Equity Fund, Index Funds, Hybrid Funds, Specialized Funds

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Money Market Mutual Funds

- Money market funds are a type of mutual fund registered under the Invest Company Act of 1940 and regulated under rule 2a-7 of the Act
- Money market funds pay dividends that reflect prevailing short-term interest rates, are redeemable on demand, and, unlike other investment companies, seek to maintain a stable NAV, typically $1.00. This combination of principal stability, liquidity and payment of short-term yields has made money market funds popular cash management vehicles for both retail and institutional investors.
- There are many kinds of money market funds, including ones that invest primarily in government securities, tax-exempt municipal sureties, or corporate debt securities
    - Money market funds that primarily invest in corporate debt securities are referred to as prime funds

Assets in MMF (Money Market Funds)

- Assets in MM funds recently swelled to about $4.3 trillion, the highest level on record, according to data from Refinitiv Lipper going back to 1992.
- Assets in money market funds have grown by about $1 trillion this year, pushing assets in these funds above the prior high of roughly $3.8 trillion reached during the last financial crisis

MMF vs. MMDA

1. Money market fund : is a type of mutual fund. It is not guaranteed or FDIC insured. When you buy shares in a money market fun, you should receive a prospectus
2. Money market deposit account : is a bank deposit. It is guaranteed and FDIC insured. When you deposit money in a MMDA, you should receive a truth in savings form

MMF Regulations - 2010

- Market market funds are strictly regulated by the SEC, both as mutual funds generally and pursuant to Rule 2a-7 under investment company act of 1940
- Rule 2a-7 includes several conditions that limit risk in a MMFs portfolio by governing the credit quality, liquidity, diversification and maturing of MMF investments
- The securities and exchange commission (SEC) in January 2010 approved amendments to Rule 2a-7 under the Investment Company Act of 1940. The amendments tighten fund liquidity requirements, impose stricter quality requirements, address reliance of rating agencies, impose stricter maturity limits, require enhanced disclosure of portfolio holding and address issues that arise when a MMF experience market challenges
- Funds that meet Rule 2a-7's risk-limiting provisions are allowed to value their securities at amortized cost, rather than at market value. This allows the fund to value its shares at a fixed price (usually $1.0) under a wide range of market conditions

Regulation of MMMF

1. Credit quality : at least 97% of a MMFs assets much be invested in securities that receive the highest short-term rating or securities of comparable quality (known as "First Tier Securities")
2. Liquidity : all taxable funds must maintain 10% of assets in "daily liquid assets", which means cash, U.S. Treasuries, or securities that mature or are subject to demand feature within one business day. All funds also must have "weekly liquid assets", which means cash, U.S. Treasuries, other government securities with remaining maturities of 60 days or less, or securities that mature or are subject to a demand feature within five days.
3. Diversification : money market funds may not invest more than 5% of assets in the securities of any single issuer. The limit is set at 0.5% if the issuer has received rating in the second highest short-term rating category
4. Maturity : Money market funds cannot acquire a portfolio security with a remaining maturity of greater than 397 days. Money market funds are required to maintain a dollar-weighted average maturity of 120 days or less without consideration of interest rate reset dates or variable-or floating-rate securities

2014 Amendments (effective 2016)

The new rules:

- Require a floating net asset value (NAV) for institutional prime money market funds, which allows the daily share prices of these funds to fluctuate along with changes in the market-based value of fund assets. These funds no longer will be allowed to use the special pricing and valuation convention that used to permit them to maintain a constant share price of $1.0
- Provide non-government money market fund boards new tools - liquidity fees and redemption gates - to address runs

Prudential Ratios - Capital Requirements
- Banks are required to hold a certain level of capital (book equity) that depends on the type of assets that the bank holds
  - Reduce moral hazard
  - In the US, higher capital means more collateral for FDIC

3 types of Capital requirement in US
1. <u>Leverage ratio</u> = bank capital/total assets >5%
2. <u>Capital adequacy tattoo</u> = capital/(total risk weighted assets & other risk-related exposure) >8% with "core"(or tier1) capital >4%
3. Capital requirement on trading activities (Basel 1996 Market Risk Amendment) for banks engaging in such → bakes on banks own models, calculate max loss over ten day period and provide additional capital (tier 3) covering 3 times that amount

In the US, Banks are classified in 5 groups based on their CAR. FDIC has to take prompt corrective action of groups 3-5

Capital Adequacy Ratio "BIS ratio" Basel I
Banks in all participating nations must have a minimum Capital Adequacy Ratio (CAR) of total capital to sun of risk-weighted assets and other related risk-exposed items of 8%

$$CAR = \frac{CB}{RWA} \geq 8\%$$

CB = Capital Base
RWA = Risk Weighted Assets
1. Tier 1 pr "core" (permanent) capital
   a. Tangible equity including common stock
   b. Non cumulative preferred sticks + other hybrid equity instruments
   c. Surplus plus retained earnings
   d. Minority interest in consolidated subsidiaries
   e. Capital reserves less intangibles
2. Tier 2 or "supplemental" capital (upper Tier 2 and lower Tier 3)
3. Subordinated capital notes & debentures > 5 years to maturity
4. Limited-life preferred stock + cumulative perpetual preferred stock
5. Loan loss reserves

Risk Weights	Four Categories
0.00	Items that have little default risk. Eg. cash; OECD government securities
0.20	Some degree of minimal risk Eg. other types of government securities; claim on banks in OECD countries; interbank deposits
0.50	Secured/collateralized loans Eg. residential mortgage loans, government revenue bonds; selected types of mortgage backed securities
1.00	Maximum degree of risk Eg. commercial and consumer unsecured loans and other assets of the highest risk exposure

Off balance sheet instruments such as:
Letters of credit Futures Swaps FX agreements
- Are converted into credit risk equivalents and weighted by the type of counterparty to given claim according to the risk weight categories (eg. OECD government : 0%)

Calculating the BIS Ratio

Calculating Risk-Adjusted Requirements

Calculate Based I (BIS) Ratio

1996 Market Risk Amendment
Set minimum capital requirements for risks in banks trading accounts (effective from 1998)
- Capital requirements for large banks that have substantial trading businesses adjusted to incorporate general market risk
- Capital requirement are based on banks own assessment of risk when applying a value-at-risk (VAP) model and generally complemented by stress-testing

The Second Basel Capital Accord (Basel II)
1. Recognition the Basel I no longer adequate for current banking environment in particular environment in particular because it does not require that banks hold capital against risks such as operation risk
2. Proposal June 1999 to expand and revise the 1988 accord in 4 main areas
   a. Expand number of risk categories and use external credit ratings
      i. Credit ratings are the result of continuous assessment of a borrowed solvency. This assessment leads to the award of a credit rating reflecting an opinion about the risk of a borrowing. It can be internal (by banks) or external (rating agencies or credit insurers)
   b. Use own credit risk models : banks can choose their own approach
   c. Internal management procedures subject to supervisory review
   d. Increased disclosure
3. 2 new objectives added in revised proposal
   a. Provide banks with impetus and incentive for enhanced risk measurement and management
   b. Promote market discipline by way of improved disclosure
4. Keu area: identification, quantification and measurement of risk. Basel II aims to relate the capital requirement not only to the amount of risk that banks undertake, but also how well they manage that risk
   a. Focus on the management of risk as well as the measurement of risk
5. Basel II adopted a "3 Pillar" structure
   a. Pillar 1: sets out a minimum capital requirement for a banks credit, market and operational risks
   b. Pillar 2: deals with other risks not covered under Pillar 1; requires banks to hold capital to cover these risks; and requires supervisors to review banks capital planning
   c. Pillar 3: requires a bank to enhance its public disclosures on its risk profile, capital adequacy and key financial information

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    a. Ensure adequate consumer protection
    b. Ensure the integrity and fairness of markets
    c. Monitor the safety and soundness of financial institutions
    d. Ensure the stability of the overall financial system
    e. Protect sophisticated investors

74. Which type of risk have regulators globally been trying to identify and manage through the set-up of the Financial Stability Board and similar regional boards?
    a. Operational risk
    b. Systemic risk
    c. Credit risk
    d. Counterparty risk
75. What are CAMELS ratings and what are they used for
    a. Credit rating agencies use them to valuate emerging countries sovereign debt risks
    b. Credit bureaus and scoring agencies use this system to design credit scores for consumers
    c. Fund managers use them to identify liquidity indicators
    d. Central banks use this system in their examinations of banks to evaluate the risk of the bank
76. In the US, Reg B is intended to
    a. Protect the banks from default
    b. Protect customers against discrimination
    c. Provide customers with easily comparable information
77. The increased integration of financial markets across countries and the need to make the playing field equal for banks from different countries led to the Basel agreement (Basel I) to
    a. Standardize bank capital requirements internationally
    b. Reduce, across the board, bank capital requirements in all countries
    c. Sever the link between risk and capital requirements
    d. Do all of the above
78. Under Basel I what amount of capital do the banks have to maintain as a proportion of their risk weighted assets?
    a. 5%
    b. 3%
    c. 8%
    d. 12%
79. Which type of risk was added in the coverage of capital requirement under Basel III?
    a. Credit risk
    b. Market risk
    c. Operational risk
    d. Counterparty risk
80. Glass-Steagall Act is an example of which type of banking regulation?
    a. Bank supervision
    b. Disclosure requirements
    c. Restrictions on asset holdings
    d. Consumer protection
    e. Restrictions on competition
    f. Prudential ratios

81. One problem of the “too-big-to-fail” policy is that it … the incentives for … by big banks
    a. Reduces; moral hazard
    b. Increases; moral hazard
    c. Reduces; adverse selection
    d. Increases; adverse selection
82. One of the main issues US banks have with the Basel III definition of the leverage ratio is
    a. The level of the ratio is too high
    b. The definition of capital is too narrow
    c. The risk weight categories applicable to assets are too simple and not well defined
    d. The computation of assets looks at gross asset value even if collateral and netting is available
83. In a shareholders' meeting which type of voting applies when shareholders vote for each director separately?
    a. Straight voting
    b. Cumulative voting

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b. MAS
c. PBOC

107. Money market mutual funds originated when the brokerage firm Merrill Lynch offered its customers an account from which funds could be taken to purchase securities and into which funds could be deposited when securities were sold
a. True
b. False

108. The increase in the number of defined contribution pension funds has slowed the growth of mutual funds
a. True
b. False

109. Active fund managers seek to:
a. Generate alpha
b. Generate beta

110. Which of the following is a feature of index funds?
a. They have lower fees
b. They select and hold stocks to match the performance of a stock index
c. They do not require managers to select stocks and decide when to buy and sell
d. All of the above

111. The annual return of a stock is normally distributed with a 7% mean and a 6% volatility; give a 99% confidence interval for its return in one year?
a. -7.48% < Return < 25.48%
b. -8.48% < Return < 22.48%
c. -9.48% < Return < 21.48%

112. The annual return of a stock is normally distributed with a 5% mean and a 2% volatility, what is the worst case scenario for its return in one year with a 2.5% chance of error?
a. 1.08%
b. 2.05%
c. 1.78%

113. Stock A has a 10% expected return and a 0.0049 variance. Stock B has a 6% expected return and a 0.0064 variance. The covariance between A and B is -0.00168. Calculate the volatility of A and B
a. Vol of A: 6% vol of B: 8%
b. Vol of A: 7% vol of B: 9%
c. Vol of A: 7% vol of B: 8%
d. Vol of A: 8% vol of B: 7%

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1. A stock will pay a dividend of $10 at the end of year 1, then the dividend will grow by 2 % annually for ever. The expected return is 5.1 %. What should be the share price today?
a. 10/0.051-0.02 = 322.58

2. ABC stock price is expected to reach HKD 70 at the end of the year, and to pay a dividend of $1.2 per share. Investors' expected rate of return is 8.4%. What is the dividend yield?(answer in %, to 2 d.p.)
a. 1.83%
b. Re = (div 1 + p1 / p0) - 1
c. Div yield = div 1 / p0

3. XYC stock price is expected to reach USD45.5 at the end of the year, and to pay a dividend of 56 cents per share. Investors' expected rate of return is 5.5 %. What is the expected stock price today?
a. P0 = div1 + p1 /1 + re
b. 43.66

4. ABC stock price is expected to reach HKD 70 at the end of the year, and to pay a dividend of $1.2 per share. Investors' expected rate of return is 8.4%. What is the capital gain rate?(answer in %, to 2 d.p.)
a. 6.57%
b. P1 - P0 / P0
    i. P0 = div1 + p1 /1 + re

5. XYC stock price is expected to reach USD45.5 at the end of the year, and to pay a dividend of 56 cents per share. Investors' expected rate of return is 6.1 %. What is the expected stock price today?