FINANCIAL ECONOMICS

金融经济学

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第 1 章　金融决策与企业

Financial Decisions and the Firm

依据：Bodie 2e Ch1；Chapter 1 课程资料

稀缺资源 → 金融索取权 → 家庭与企业决策 → 公司治理 → 净资产

1.1　稀缺资源、索取权与家庭选择

Scarcity, claims and household choices

> **PRINCIPLE**　金融决策分配时间与风险；权益分享剩余收益。

金融学（finance）研究稀缺资源如何在不同日期与不同不确定状态之间配置。今天的支出和未来的收益不能直接相加，未来结果也可能因状态不同而改变，因此时间（time）与风险（risk）贯穿金融决策。**实物资本**（physical capital）是生产商品或服务的设备、建筑等资源；**金融资本**（financial capital）体现为为资源提供融资而形成的资金及索取权。金融索取权不是凭空增加一套实物资源，而是分配其收益与风险。

资产（asset）是具有经济价值的资源；负债（liability）是对其他主体的偿付义务；**净资产**或净财富（net worth / wealth）是同一日期全部资产价值减全部负债价值。企业的**股东权益**（shareholders' equity / stockholders' equity）是支付优先索取权之后属于所有者的剩余**权益**。债券（bond）或贷款（loan）按合同规定本息，普通股（common stock）分享剩余收益。优先股（preferred stock）依条款在股息或清算分配上优先于普通股；可转换证券（convertible security）还包含按条件转换为另一类证券的权利。契约限制条款（covenant）约束发行人或借款人的行为，以保护债权人。

家庭先决定当前消费与未来消费之间如何分配资源，即**消费与储蓄决策**（consumption-saving decision）；再决定财富配置于哪些资产，即投资或资产配置决策（investment / asset allocation decision）。如果需要提前使用资金，还要作**融资决策**（financing decision），例如选择房贷（mortgage）、车贷或学生贷款（student loan）。不确定收入和损失则产生**风险管理决策**（risk-management decision），例如购买失能保险（disability insurance）、寿险（life insurance）或调整风险头寸。保险保费（premium）是购买保障的付款，保单（insurance policy）规定保险给付。

1.2 组织形式、规模与代理成本

Organization creates both scale and agency costs

> **PRINCIPLE** 经营权分离带来专业化与规模，也产生代理问题。

个人独资企业（sole proprietorship）由一名所有者经营，所有者通常对企业**债务**承担**无限责任**（unlimited liability）。合伙企业（partnership）由两个或更多合伙人共同经营，责任和纳税依组织形式与制度而定。公司（corporation）是与股东分离的法律实体，股份可以转让；**有限责任**（limited liability）限制股东对公司债务的通常责任，但不保证其股票投资不受损失。私人公司（private corporation）在题库语境中所有权较集中，公众公司（public corporation）所有权可较分散；public 不等于国有。

公司制让所有权与经营权分离（separation of ownership and management）：职业经理可能更擅长经营；汇集多户资金有利于达到有效规模（efficient scale）；股东可以跨企业分散风险（diversification）；专业信息收集节约成本；经营团队延续带来学习曲线（learning curve）与持续经营（going concern）优势。但是委托人（principal）与代理人（agent）的目标不一定相同，经理可能偏好私人待遇或职位安全，形成**委托代理问题**（principal-agent problem）、利益冲突（conflict of interest）和**代理成本**（agency cost）。

公司治理（corporate governance）用权利、监督与激励协调上述冲突。股东选举董事会（board of directors），董事会任命并监督管理者。竞争性股票市场（competitive stock market）提供市场价格（market price），把分散判断转化为价值信号，也允许股东调整自己的投资组合。收购（takeover）与公司控制权市场可更换低效管理层；收购发起人（raider）要支付识别低效经营的信息成本和取得股份的成本。供应商、客户或竞争者可能已有相关信息，政府的收购规则也会影响这项外部约束。

公司目标是**股东财富最大化**（shareholder-wealth maximization），即提高现有**权益**的**市场价值**。利润最大化（profit maximization）若不说明会计口径、期间、现金时点和风险，就不是完整准则。留存收益（retained earnings）是未分配利润的累积部分，不是独立存放的一箱现金；股息（dividend）是对股东的分配。双重征税（double taxation）模型中，公司利润先缴公司税，分配后股东再缴股息税，总税后所得为 $X(1-\tau_c)(1-\tau_d)$，两个税率不能直接相加。

1.3 从战略到日常资金

From strategy to daily funds

> **PRINCIPLE** 投资决定用途，融资决定来源，营运管理保证日常支付。

战略规划（strategic planning）选择业务方向；**资本预算**（capital budgeting）识别、评价、选择和实施长期投资项目（investment project）；**资本结构**（capital structure）为企业整体选择**债务**与权益融资组合，先确定可行融资方案（feasible financing plan），再比较最优融资组合（optimal financing mix）；营运资本管理（working capital management）处理现金、存货（inventory）、应收账款（accounts receivable）与短期应付，保证流动性（liquidity），即按时履行付款义务的能力。流动资产（current assets）和流动负债（current liabilities）对应一年或正常营业周期内的资源和义务，净营运资本为两者之差。

首席执行官（CEO / chief executive officer）统筹经营，首席财务官（CFO / chief financial officer）统筹财务。题库的三项 CFO 下属职能是财务规划（financial planning）、司库或资金管理（treasury / treasurer）、会计与控制（control / controller / comptroller）。规划分析并购（merger / acquisition）、分拆（spin-off）和重大资本支出；司库管理融资、营运资金、投资者关系（investor relations）及金融风险，题设还将税务部门置于其下；控制职能侧重财务报表（financial statements）、会计（accounting）、审计（auditing）及计划实际差异报告。资金保管职责（custodial responsibilities）属于资金管理，监管立法（regulatory legislation）属于公共机构而非企业内部职能。

公司名称后缀用来辨认组织形式，不是收益率指标。Inc. 为 incorporated，Corp. 为 corporation，Co. 为 company；英国 PLC 为 public limited company，Ltd. 为 limited；德国 AG 为 Aktiengesellschaft，GmbH 为 Gesellschaft mit beschränkter Haftung。资产负债表（balance sheet）描述某日期财务存量，利润表（income statement）描述一段期间经营结果，年度报告（annual report）还包含管理层目标和经营说明。

1.4 净资产计算原理

Calculation principle: net worth

> **PRINCIPLE** 统一日期与估值口径，全部资产减全部负债即为净资产。

净资产题先确定同一所有者、同一日期和同一估值口径，再将每项归为资产或尚未清偿负债。房屋与房贷、汽车与车贷分别列示，家具与珠宝只要题给价值也计入资产。不能因为存款和卡债金额相等就遗漏其中一项，更不能把总资产当成净资产。

$$NW = \sum_{i} A_i - \sum_{j} L_j, \qquad Assets = Liabilities + Equity.$$

例如资产住宅 100、存款 20，负债房贷 70、卡债 5，**净资产**为 $100+20-70-5=45$。负的净资产表示按题给估值负债超过资产。净资产是某日金额，不是每年收入；未偿**本金**是剩余义务，不是当初借款的历史总额。

1.5 英文概念与原理

English Definitions and Principles

1. Scarcity, claims and household choices

Finance studies the allocation of scarce resources across time and uncertain states. A financial choice compares costs and benefits occurring at different dates and under different possible outcomes. Physical capital consists of productive resources such as equipment and buildings.

Financial capital supplies funding and establishes claims on the income generated by those resources; the claims allocate ownership and risk rather than create a second set of physical resources.

An asset is a resource with economic value, a liability is an obligation to another party, and net worth is the value of assets less liabilities at the same date. Corporate equity is the residual claim after prior claims are satisfied. Bonds and loans specify contractual payments; common shares receive residual distributions.

Preferred shares have contractual priority over common shares in specified distributions. Convertible securities include conversion rights. Covenants restrict certain borrower or issuer actions to protect creditors.

Households first decide how much to consume now and save for later. They then allocate wealth among assets. Financing decisions determine whether and how to borrow, for example through a mortgage, a car loan, or a student loan.

Risk-management decisions determine which risks to retain, reduce, or transfer, including through disability or life insurance. A premium is the payment for insurance coverage, and the insurance policy specifies the promised protection and its conditions.

2. Organization creates both scale and agency costs

A sole proprietorship has one owner, who generally bears unlimited liability for business obligations. A partnership has two or more partners, with liability and taxation determined by its legal form and jurisdiction. A corporation is a legal entity distinct from its shareholders, and shares can be transferred.

Limited liability restricts shareholders' ordinary exposure to corporate debts but does not protect the value of their investment. In the test-bank setting, pri-

vate corporations have relatively concentrated ownership and public corporations have more dispersed ownership; public does not mean state-owned.

Separating ownership from management can improve professional competence, pool resources to reach an efficient scale, allow owners to diversify across firms, reduce information costs, and preserve learning and going-concern benefits.

The separation also creates a principal-agent problem: an agent entrusted with control may pursue objectives different from those of the principals. Private benefits or job protection can conflict with shareholder interests and generate agency costs.

Corporate governance uses control rights, monitoring, and incentives to address conflicts. Shareholders elect directors, who appoint and monitor managers. A competitive stock market supplies market-price information and allows shareholders to adjust their own portfolios.

Takeovers can replace inefficient managers and create an external discipline. A potential acquirer incurs information and share-acquisition costs; suppliers, customers, and competitors may already possess useful information. Government rules can strengthen or weaken this control-market mechanism.

Shareholder-wealth maximization seeks to increase the market value of existing equity. Profit maximization is incomplete unless the accounting measure, period, timing, and risk are specified. Retained earnings accumulate undistributed profits and are not a separate cash account. Dividends distribute resources to shareholders.

In the double-taxation model, corporate profit is taxed at the corporate level and dividends are taxed again at the shareholder level; the after-tax amount is the product of the two after-tax factors.

3. From strategy to daily funds

Strategic planning selects business lines. Capital budgeting identifies, evaluates, selects, and implements long-term investment projects. Capital-structure decisions choose the firm's overall debt-equity mix, starting with a feasible financing plan and then selecting among feasible mixes.

Working-capital management handles cash, inventories, receivables, and short-term obligations to maintain liquidity, the ability to make payments when due.

Current assets and current liabilities relate to the coming year or normal operating cycle; their difference is net working capital.

The CEO directs the business and the CFO coordinates financial functions. The test-bank organization places financial planning, treasury, and control under the CFO. Planning evaluates major investments, mergers, acquisitions, and spin-offs.

Treasury manages funding, working capital, investor relations, and financial exposures; this particular organization also assigns tax administration to treasury. Control prepares financial statements, manages accounting and auditing, and compares actual performance with plans. Custodial responsibilities safeguard funds.

Regulatory legislation is a public authority's function, not an internal corporate finance function.

Corporate suffixes identify organizational forms rather than investment performance. Inc., Corp., and Co. abbreviate incorporated, corporation, and company. PLC means public limited company and Ltd. means limited. AG and GmbH denote German corporate forms.

A balance sheet describes financial stocks at a date; an income statement describes operating results over a period; an annual report also includes management's objectives and discussion.

4. Calculation principle: net worth

A net-worth calculation first fixes the owner, date, and valuation basis, then classifies each item as an asset or an outstanding liability. A house and its mortgage, or a car and its loan, enter separately. Furniture and jewelry are assets when values are provided. Equal deposit and credit-card balances still belong to opposite sides.

Total assets alone are not net worth.

For a house worth 100 and deposits of 20, against a mortgage balance of 70 and card debt of 5, net worth is 45. A negative result means liabilities exceed assets under the stated valuation.

Net worth is a stock measured at a date, not annual income, and an outstanding balance is the remaining obligation rather than the original amount borrowed.

C1-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-1

The primary goal of corporate management is to ____ shareholder wealth.

(a) minimize

(b) maximize

(c) leverage

(d) mitigate

C1-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-2

A ____ stock market imposes ____ discipline on managers to take actions to maximize the market value of the firm's shares.

(a) competitive, strong

(b) dispersed, weak

(c) mature, no

(d) dispersed, strong

C1-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-3

The ____ form is especially well suited to the separation of ownership and management of firms because it allows relatively frequent changes in owners by share transfer without affecting the operations of the firm.

(a) corporate

(b) sole proprietorship

(c) partnership

(d) household

C1-MC-4 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-4

____ is anything that has economic value.

(a) partnership

(b) An asset

(c) balance sheet

(d) An income statement

C1-MC-5 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-5

A household's wealth or net worth is measured by the value of its ____ minus its ____.

(a) liabilities; assets

(b) assets; liabilities

(c) stocks; bonds

(d) bonds; liabilities

C1-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-6

The branch of finance dealing with financial decisions of firms is called ____ or ____.

(a) investments; international finance

(b) markets; institutions

(c) business finance; institutions

(d) business finance; corporate finance

C1-MC-7 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-7

Bonds promise ____ cash payments, while stocks pay the ____ value left over after all other claimants have been paid.

(a) variable; residual

(b) residual; fixed

(c) fixed; residual

(d) fixed; variable

C1-MC-8 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-8

The day-to-day financial affairs of the firm are usually referred to as ____.

(a) working capital management

(b) capital structure

(c) capital budgeting

(d) strategic planning

C1-MC-9 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-9

A disadvantage of the sole proprietorship is the fact that the sole proprietor has ____.

(a) limited liability for the debts of the firm

(b) unlimited liability for the debts of the firm

(c) expensive costs to establish the firm

(d) limited authority over the day-to-day business decisions of the firm

C1-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-10

In the U.S. corporations with concentrated ownership are called ____ and corporations with broadly dispersed ownership are called ____.

(a) private corporations; public corporations

(b) public corporations; private corporations

(c) public corporations; monopolies

(d) private corporations; state owned corporations

C1-MC-11 概念辨析与短计算

⋆ Bodie 2e 配套题库；C1-MC-11

Billy owns a house worth $350,000 and has a $55,000 bank account. Billy owes $270,000 to the bank on a home mortgage loan and has a $12,000 credit card debt outstanding. Calculate Billy's net worth.

(a) $135,000

(b) $123,000

(c) $497,000

(d) $37,000

C1-MC-12 概念辨析与短计算

⋆ Bodie 2e 配套题库；C1-MC-12；HW1-Q3

Marlowe owns a house worth $150,000, a car worth $25,000 and has an $18,000 bank account. Marlowe owes $135,000 to the bank on a home mortgage loan, $18,000 on the car loan and has an $18,000 credit card debt outstanding. Calculate Marlowe's net worth.

(a) $58,000

(b) $123,000

(c) $22,000

(d) $37,000

C1-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-13

An advantage of the corporate form of ownership is ____.

(a) no liability

(b) unlimited liability

(c) limited liability

(d) CEO liability

C1-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-14

In the corporate form, the separated structure creates the potential for ____ between owners and managers.

(a) conflict of interest

(b) increased transactional costs

(c) stability in relations

(d) none of the above

C1-MC-15 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-15

All of the following are reasons for having a separation of management and ownership of the firm except:

(a) the "going concern" effect favors the separated structure

(b) professional managers may be found who possess a superior ability to run the business

(c) it prevents the possibility of a conflict of interest between the owners and management

(d) it allows for savings in the cost of information gathering

C1-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-16

____ involves the evaluation of costs and benefits spread out over time, and it is largely a financial decision-making process.

(a) Stock valuation

(b) Bond valuation

(c) Inventory costing

(d) Strategic planning

C1-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-17

Shareholder wealth maximization depends on all of the following except:

(a) production technology

(b) market interest rates

(c) risk aversion

(d) market risk premiums

C1-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-18

A problem with using the profit maximization criterion is ____.

(a) deciding which period's profit is to be maximized

(b) the definition of "maximize profits" is ambiguous

(c) the failure to consider risk

(d) all of the above

C1-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-19

The existence of a well functioning stock market facilitates the efficient separation of the ownership and management of firms, since stock prices can be substituted for external information about ____.

(a) the firm's production technology

(b) the wealth, preferences, and other investment opportunities of the owners

(c) the historic costs of the firm's infrastructure

(d) the firm's ability to meet its projected goals

C1-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-20

One place to look for a statement of the goals of a corporation's top managers is the ____.

(a) balance sheet

(b) income statement

(c) annual report

(d) bankruptcy filing

C1-MC-21 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-21

In the absence of a stock market, managers would require information that is ____ to obtain.

(a) costly if not impossible

(b) costless

(c) readily available

(d) time-consuming but inexpensive

C1-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-22

Management's task is made much easier when it can observe the ____ of its own and other firms' shares.

(a) book prices

(b) market prices

(c) historical prices

(d) security prices

C1-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-23

____ are entitled to a share of any of the distributions from the corporation such as cash dividends.

(a) Sole proprietors

(b) General partners

(c) Professional managers

(d) Shareholders

C1-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-24

____ is the founder of modern portfolio theory.

(a) Harry Markowitz

(b) Merton Miller

(c) William Sharpe

(d) Bill Gates

C1-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-25

In Germany, public corporations are identifiable by ____ after the company name, whereas private companies are denoted by ____.

(a) PLC, Inc.

(b) GmbH, AG

(c) AG, GmbH

(d) SpA, GmbH

C1-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-26

In the United Kingdom, public corporations are identifiable by ____ after the company name, whereas private companies are denoted by ____.

(a) Inc, PLC

(b) LTD, PLC

(c) AG, GmbH

(d) PLC, LTD

C1-MC-27 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-27

Shareholders elect ____ who in turn select ____ to run the business.

(a) board of directors; a treasurer

(b) board of directors; managers

(c) managers; a board of directors

(d) board of directors; accountants

C1-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-28

In a competitive stock market, ____ offer(s) another important mechanism for aligning the incentives of managers with those of shareholders.

(a) takeovers

(b) increased taxes

(c) liquidation

(d) increased liability

C1-MC-29 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-29

If a raider is interested in making a profit through the takeover of a prospective firm, the only expenses that need be incurred are ____.

(a) the cost of identifying a mismanaged firm

(b) the cost of acquiring the firm's shares

(c) physical capital

(d) both (a) and (b)

C1-MC-30 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-30

The cost of identifying a mismanaged firm can be low if the raider is which of the following:

(a) supplier

(b) customer

(c) competitor

(d) all of the above

C1-MC-31 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-31

Takeover mechanisms can most effectively be reduced by ____.

(a) directives from the board of directors

(b) media intervention

(c) government policies

(d) public disapproval

C1-MC-32 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-32

The chief financial officer (CFO) of a corporation normally reports to the ____ of the company.

(a) controller

(b) treasurer

(c) chief executive officer

(d) chairman of the board of directors

C1-MC-33 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-33

All of the following departments typically report to the chief financial officer (CFO) except:

(a) marketing

(b) financial planning

(c) treasury

(d) control

C1-MC-34 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-34

The treasurer's job includes managing all of the following except:

(a) the firm's exposure to currency and interest rate risks

(b) the tax department

(c) relations with the external investment community

(d) the analysis of proposed mergers and acquisitions

C1-MC-35 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-35

The activities of the vice president for financial planning include all of the following except:

(a) analyzing proposed mergers

(b) analyzing proposed spin-offs

(c) preparing internal reports comparing planned and actual costs

(d) analyzing major capital expenditures

C1-MC-36 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-36

Which of the following statements is most correct?

(a) The shareholders of a corporation elect managers who in turn select a board of directors to run the business.

(b) Partnerships do not pay corporate tax.

(c) disadvantage of the corporation is unlimited liability.

(d) The government is powerless to discourage corporate takeovers.

C1-MC-37 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-37

For a typical firm, which of the following statements is most correct?

(a) The CFO has three departments reporting to him: financial planning, treasury and control.

(b) The treasurer oversees the accounting and auditing activities of the firm.

(c) The controller has responsibility for managing the financing activities of the firm and for working capital management.

(d) The CEO is a senior vice president with responsibility for all the financial functions in the firm.

C1-MC-38 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-38

Which of the following are financial decisions a firm has to make?

(a) financing decisions

(b) capital budgeting decisions

(c) working capital decisions

(d) all of the above

C1-MC-39 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-39

The controller's job includes responsibility for ____.

(a) relations with the external investment community

(b) preparation of financial statements for use by shareholders, creditors and regulatory authorities

(c) analysis of proposed mergers, acquisitions and spin-offs

(d) all of the above

C1-MC-40 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-40

The basic unit of analysis in capital budgeting is the ____.

(a) financing project

(b) investment project

(c) strategic project

(d) variable project

C1-MC-41 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-41

The steps involved in any capital budgeting process include:

(a) evaluating projects

(b) deciding which projects to undertake

(c) identifying ideas for new investment projects

(d) all of the above

C1-MC-42 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-42

Preferred stock, bonds, and convertible securities are also known as ____.

(a) nonmarketable claims

(b) standardized securities

(c) variable securities

(d) covenants

C1-MC-43 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-43

The basic unit of analysis in capital structure decisions is the ____.

(a) firm as a whole

(b) investment project

(c) firm's personnel

(d) financial system

C1-MC-44 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-44

Which one of the following correctly orders the steps involved in capital structure decisions?

(a) determining a feasible financing plan; identifying new ideas for investment projects

(b) determining the optimal financing mix; determining a feasible financing plan

(c) identifying ideas for investment projects; determining the optimal financing mix

(d) determining a feasible financing plan; determining the optimal financing mix

C1-MC-45 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-45

Which of the following is not a financial function of a corporation?

(a) investor relations

(b) tax administration

(c) provision of capital

(d) regulatory legislation

C1-MC-46 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-46

Which of the following functions may be categorized as administration of funds?

(a) custodial responsibilities

(b) tax administration

(c) internal auditing

(d) all of the above

C1-MC-47 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-47

Investor relations includes:

(a) government reporting

(b) establishment and maintenance of communications with company stockholders

(c) relations with taxing agencies

(d) consultation with and advice to other corporate executives

C1-MC-48 概念辨析与短计算

Bodie 2e 配套题库；C1-MC-48

Oscar owns a boat worth $2 million, a house worth $5.5.million and has $900,000 in a bank account. Oscar owes $1.1 million to the bank on the boat loan, $2 million on the home loan and has $20,000 credit card debt. Calculate Oscar's net worth.

(a) $3.12 million

(b) $5.28 million

(c) $7.28 million

(d) $8.4 million

C1-SHORT-5 方法练习

Bodie 2e 配套题库；C1-SHORT-5

Siggy owns a house worth $200,000, a car worth $25,000 and has an $18,000 bank account. He also has furniture worth $4,000 and jewelry worth $10,000. However, Siggy owes $145,000 to the bank on a home mortgage loan, $17,000 on the car loan, $40,000 on student loans and has an $16,000 credit card debt outstanding. Calculate Siggy's net worth.

C1-SHORT-7 方法练习

Bodie 2e 配套题库；C1-SHORT-7

Kecia owns a house worth $220,000, a car worth $20,000 and has a $13,000 bank account. She also has furniture worth $8,000. However, Kecia owes $165,000 to the bank on a home mortgage loan, $17,000 on the car loan, $50,000 on student loans and has an $18,000 credit card debt outstanding. Calculate Kecia's net worth.

第 2 章　金融体系与市场价格

The Financial System and Market Prices

依据：Bodie 2e Ch2；Chapter 2 课程资料

资金供求 → 市场与中介 → 证券与信息 → 收益与风险 → 股票指数

2.1　金融需求、市场与中介

Financial needs lead to markets and intermediaries

> **PRINCIPLE**　市场与中介连接资金供求，合同条款分配权利与风险。

金融体系（financial system）由金融市场、金融中介、服务机构与支付法律等基础设施组成，连接资金盈余主体（surplus unit）与资金短缺主体（deficit unit）。**直接融资**（direct finance）由需求者向投资者发行证券；**间接融资**（indirect finance）通过中介资产负债表连接双方。脱媒（disintermediation）表示绕过传统中介，不表示完全没有任何服务机构。一级市场（primary market）交易新发行证券，二级市场（secondary market）转让已有证券；场外市场（OTC / over-the-counter market）不必有唯一物理交易地点。

这些组织满足六项相互连接的金融功能：跨时间、地区和行业转移资源（transferring resources）；管理风险（managing risk）；完成清算与结算（clearing and settlement）；汇集资源并拆分份额（pooling resources and subdividing shares）；提供协调决策的价格信息（price information）；处理信息与激励问题（incentive problems）。清算确定交易义务，结算完成钱与证券交付。机构形式可以改变，基本需求仍存在。

商业银行（commercial bank）提供存款、贷款与支付服务；支票账户或活期存款（checking account / demand deposit）便于支付，定期存款（time deposit）约定期限，定期存单（CD / certificate of deposit）记录相应存款合同。**投资银行**（investment bank）帮助发行证券、承销（underwriting）和并购。风险资本投资者（venture capitalist）为早期企业提供股权与经营支持，可能在首次公开发行（IPO / initial public offering）时退出；资产管理公司（asset-management firm）管理客户投资组合；保险公司（insurance company）收取保费并支付合同保险给付。

共同基金（mutual fund / investment company）汇集投资者资金，提供专业管理、分散化及账户记录服务。**基金份额**（fund share）是投资者对基金的索取权，不是基金买入股票的股数。**开放式基金**（open-end fund）通常按净值规则申赎，封闭式基金（closed-end fund）份额主要经经纪商（broker）在市场转让，交易价可以相对净值溢价或折价。ETF 为 exchange-traded fund（交易所交易基金）。指数化（indexing）以复制指数表现为目标，基准（benchmark）用于评价，费用率（expense ratio）衡量年度费用相对基金资产的比例。

$$NAV = \frac{\text{Market value of fund assets} - \text{Fund liabilities}}{\text{Fund shares outstanding}}.$$

养老金（pension）把工作期资源转为退休期支付。**缴费确定型**（defined-contribution / DC）规定缴费规则，待遇随账户表现变化；**待遇确定型**（defined-benefit / DB）按年资、工资等公式确定给付。**终身年金**（life annuity）在领取者生存时持续支付，帮助转移长寿风险（longevity risk），即寿命过长导致退休资金不足的风险。

2.2 金融索取权与信息不对称

Claims and asymmetric information

> **PRINCIPLE** 逆向选择涉及签约前的类型，道德风险涉及签约后的行为。

债务（debt / fixed-income instrument）规定合同本息等支付；**权益**（equity）是剩余索取权；**衍生工具**（derivative）依赖标的资产（underlying asset）或指标价值。货币市场（money market）以短期债务为主，资本市场（capital market）包括中长期债务与权益。美国短期国库券（U.S. Treasury bill / T-bill）是短期政府债务；长期国债（Treasury bond）期限更长。通胀保值国债（TIPS / Treasury Inflation-Protected Securities）按物价调整相关给付，降低购买力不确定性，但不保证任何持有期市场价值不变。

看涨期权（call option）给买入权，**看跌期权**（put option）给卖出权，行权价（strike / exercise price）为 K，到期日（expiration / maturity）为 T。欧式期权（European option）仅到期行权，美式期权（American option）可按条款在到期前或到期行权。到期收益（payoff）分别为 $\max(P_T - K, 0)$ 和 $\max(K - P_T, 0)$，尚未扣期权费（option premium），所以不是净利润。**远期合约**（forward contract）使双方有未来买卖义务；期货（futures contract）通常标准化并采用交易所、保证金（margin）与每日结算安排。

交易双方掌握的信息不同，形成**信息不对称**（asymmetric information）。**逆向选择**（adverse selection）是签约前类型难识别，如预期更长寿者更愿买**终身年金**；道德风险（moral hazard）是签约后行动难监督，如投保后降低防损努力；委托代理问题（principal-agent problem）是受托人与委托人目标不一致。抵押（collateralization）赋予贷款人在违约（default）时依约处置指定抵押物（collateral）的权利。保障和抵押改变激励，不等于消除全部风险。

2.3 利率、承诺与风险

Interest rates compare dates, promises and risk

> **PRINCIPLE** 曲线比较同一观察日的不同期限收益率，不是未来市场利率的实现路径。

市场回报由时间偏好（time preference）、资本品预期生产率（expected productivity of capital goods）、生产率不确定性（uncertainty）与风险厌恶（risk aversion）共同影响。时间偏好较强者要求更多延迟消费补偿；预期生产率提高扩大投资机会；不确定性与风险厌恶影响风险价格。承诺收益率（promised return）按合同**现金流**计算，**实现收益率**（realized return）按实际结果计算，**预期收益率**（expected return）使用事前预期；违约风险（default risk）使三者可能不同。

名义收益率（nominal return）度量货币增长，实际收益率（real return）度量标准消费篮子（standardized consumption basket）购买力增长。**收益率曲线**（yield curve）在同一个观察日比较可比工具的**剩余期限**（maturity）与当前年化到期收益率（yield to maturity / YTM）。长期高于短期为向上倾斜（upward-sloping），相近为平坦（flat），短期高于长期为倒挂（inverted / downward-sloping）。横轴可标未来到期日，但不是每个未来日期实际出现的市场利率。票息率（coupon rate）决定合同利息，YTM 还取决于买价。

利率风险（interest-rate risk）是利率变化造成资产价值变动，再投资风险（reinvestment risk）是中间回款再投资的未来利率不确定。**收益率利差**（yield spread）是两项可比收益率之差，常以百分点（percentage points）或**基点**（basis points / bp）表示；1 个百分点等于 100bp。固定本币的安全债券仍可有通胀风险、利率风险；换成另一货币持有，还会有汇率风险（exchange-rate risk）。

2.4 收益、换币与利差原理

Calculation principles: return, currency and spreads

> **PRINCIPLE** 总回报计入分配与价差，跨币种回报还须计入汇率变化。

持有期收益（holding-period return）把每股价格变化和持有期每股股息合计相加，再除期初价格。Div 是 dividend 的金额缩写，不是除法符号。若持有多股，分子分母同时乘股数，收益率不变。季股息先乘实际季度数；期末不出售也能按**市场价值**计算经济回报。

$$R = \frac{P_1 - P_0 + Div}{P_0} = \underbrace{\frac{P_1 - P_0}{P_0}}_{\text{capital-gains yield}} + \underbrace{\frac{Div}{P_0}}_{\text{dividend yield}}.$$

资本利得收益率（capital-gains yield）是价格变化除期初价格，**股息收益率**（dividend yield）是股息除期初价格。股票总收益率为二者之和，价格下跌时仍可能因股息而总回报为正，反之亦可能亏损。

若 S 为本币/外币，初始本币 V_0 先除 S_0 换外币，再乘外币增长因子，最后乘 S_1 换回本币。资金路径给出下式，不必背两个可能倒置的汇率。目标本币收益已知时，直接移项反求 S_1。未套保（unhedged）的实际未来**即期汇率**不确定，临界汇率不是保证预测。

$$R_D = (1 + r_F)S_1/S_0 - 1, \qquad S_1 = S_0(1 + R_D)/(1 + r_F).$$

精确购买力换算用增长因子相除；相同期限的信用利差用公司债减国债。信用卡与存款题则比较同一笔资金的**增量**：偿还高息欠款减少卡息，但放弃低息存款收益。基数是实际偿还金额，净节约不是全部高息利息。

$$r = \frac{1 + i}{1 + \pi} - 1, \quad i = (1 + r)(1 + \pi) - 1, \quad Saving = X(r_{card} - r_{deposit}).$$

2.5 指数与金融基础设施

Indexes aggregate prices; institutions support trading

> **PRINCIPLE** 价格权重看每股价，市值权重看公司规模；指数点不是货币。

股票指数（stock-market index）概括一组公司表现，公司编号为 j，日期为 t。$P_{j,t}$ 是每股价，N_j 是发行在外股数，$P_{j,t}N_j$ 是股权市值。**价格加权指数**（price-weighted index）依股价确定影响，**市值加权指数**（market-value-weighted index）依公司市值确定影响。指数点数 I_t 是标准化尺度，不是货币；它上涨 10% 不表示每家公司都涨 10%。

$$I_t^P = \frac{\sum_j P_{j,t}}{d_t}, \qquad I_t^V = I_0 \frac{\sum_j P_{j,t}N_j}{\sum_j P_{j,0}N_j}.$$

指数除数（index divisor）d_t 由编制规则维护。给定**基点**，$d_0 = \sum P_{j,0}/I_0$；**拆股**（stock split）等非市场事件时，用调整后价格和除以调整前指数求新除数，保持当时指数连续。正常价格波动不能通过改除数抹掉。DJIA / Dow Jones Industrial Average 为价格加权指数，S&P 500 / Standard and Poor's 500 为较广的美国大盘股指数。波动率（volatility）常用回报标准差；算术平均回报衡量平均单期回报，几何平均衡量实际复合增长，风险溢价（risk premium）是预期风险资产回报超过可比无风险回报的部分。

$$\bar{R} = \frac{1}{M}\sum_{j=1}^{M} R_j, \quad s_R = \sqrt{\frac{\sum_{j=1}^{M}(R_j - \bar{R})^2}{M-1}}, \quad R_g = \left[\prod_{j=1}^{M}(1+R_j)\right]^{1/M} - 1.$$

题库的 1926–2003 历史样本中，大盘股（large stocks）算术平均回报 12.25%、标准差 20.5%；长期美国国债为 5.64% 与 8.19%；国库券为 3.79% 与 3.18%。选择题另将小盘股（small stocks）列为该历史比较中平均回报最高者。历史均值与波动说明不同风险回报特征，不是对未来收益的保证；平均回报高也不表示任何单年都更高。

中央银行（central bank）提供本币及核心支付支持，美联储（Federal Reserve / Fed）和德国联邦银行（Bundesbank）是题库出现的央行名称，Riksbank 为瑞典央行。SEC 为 Securities and Exchange Commission，FASB 为 Financial Accounting Standards Board，分别涉及证券披露与会计准则；BIS 为 Bank for International Settlements（国际清算银行），支持央行合作；IMF 为 International Monetary

Fund（国际货币基金组织），关注国际货币与国际收支合作；World Bank 为世界银行，涉及发展融资。Glass-Steagall Act of 1933 是题库的历史分业监管案例，不应当作今天全部仍原样有效的制度描述。

2.6 英文概念与原理

English Definitions and Principles

1. Financial needs lead to markets and intermediaries

A financial system comprises markets, intermediaries, service providers, and payment and legal infrastructure. It connects surplus units supplying funds with deficit units seeking funds. Direct finance issues securities to investors; indirect finance places an intermediary's balance sheet between suppliers and users.

Disintermediation bypasses a traditional intermediary without necessarily eliminating all financial services. Primary markets issue new securities, secondary markets transfer existing securities, and over-the-counter markets need not occupy one physical trading location.

Six related functions explain these organizations: transferring resources across time, places, and industries; managing risk; clearing and settling payments; pooling resources and subdividing claims; supplying price information; and addressing incentive problems.

Clearing establishes obligations, while settlement completes payments and delivery. Institutions may change as technology and regulation evolve, even when the underlying functions persist.

Commercial banks provide deposits, loans, and payment services. Checking or demand deposits facilitate payments, time deposits specify a term, and certificates of deposit record deposit contracts. Investment banks assist securities issuance, underwriting, and corporate transactions.

Venture capitalists fund and support young firms and may exit through an initial public offering. Asset-management firms manage client portfolios. Insurance companies collect premiums and make contractual insurance payments.

Mutual funds pool investor resources and provide professional management, diversification, and record keeping. A fund share is a claim on the fund, not a count of the securities the fund owns. Open-end funds generally issue and redeem under NAV rules; closed-end shares trade through brokers and can trade above or below NAV.

An ETF is an exchange-traded fund. Indexing seeks to track an index, a benchmark is an evaluation reference, and an expense ratio measures annual expenses relative to fund assets.

Pension arrangements transfer working-period resources into retirement payments. Defined-contribution plans specify contributions, leaving benefits dependent on account performance. Defined-benefit plans specify a benefit formula using factors such as service and salary.

A life annuity pays while the recipient survives and helps transfer longevity risk, the risk of outliving retirement resources.

2. Claims and asymmetric information

Debt or fixed-income instruments specify contractual payments, equity is a residual claim, and derivatives depend on underlying assets or indexes. Money markets primarily trade short-term debt; capital markets include longer-term debt and equity. U.S.

Treasury bills are short-term government obligations and Treasury bonds have longer maturities. Treasury Inflation-Protected Securities adjust relevant payments for inflation but do not eliminate changes in market value over arbitrary holding periods.

A call option grants a right to buy and a put grants a right to sell at an exercise price K. European options permit exercise only at expiration; American options permit exercise at the contractually allowed earlier times as well.

Expiration payoffs are the positive parts of the corresponding price differences and exclude the option premium, so they are not net profits. Forward contracts impose future purchase and sale obligations. Futures are generally standardized and use exchange trading, margin, and daily settlement.

Asymmetric information means contracting parties possess different information. Adverse selection concerns hidden types before contracting, as when longer-lived people are more willing to purchase annuities. Moral hazard concerns difficult-to-observe actions after contracting, such as reduced prevention after obtaining insurance.

Principal-agent problems arise from conflicting objectives in delegated decisions. Collateralization gives a lender contractual recourse to specified collateral following default. These mechanisms alter incentives without eliminating all risks.

3. Interest rates compare dates, promises and risk

Market returns depend on time preference, expected capital productivity, uncertainty about productivity, and risk aversion. Stronger preference for current consumption requires compensation for postponement; higher productivity creates investment opportunities; uncertainty and risk aversion affect risk pricing.

Promised returns use contractual payments, realized returns use actual outcomes, and expected returns use ex ante expectations. Default risk can cause these measures to differ.

Nominal return measures money growth and real return measures growth in the purchasing power of a standardized consumption basket. A yield curve compares remaining maturities and current annualized yields on comparable instruments at a single observation date. It may slope upward, be flat, or be inverted.

Its maturity axis can identify future repayment dates but does not plot the market interest rates that will actually prevail at those dates. A coupon rate sets contractual interest; yield to maturity also depends on purchase price.

Interest-rate risk concerns value changes when market rates change; reinvestment risk concerns uncertain future rates on reinvested receipts. A yield spread is the difference between comparable yields, measured in percentage points or basis points, with one percentage point equal to 100 basis points.

A bond safe in its own currency may still carry inflation and interest-rate risks and may generate exchange-rate risk for an investor using another currency.

4. Calculation principles: return, currency and spreads

Holding-period return adds the per-share price change and distributions over the holding period, then divides by the initial per-share price. Div denotes the dividend amount. Holding more shares multiplies numerator and denominator equally. Quarterly dividends must be aggregated over the relevant quarters.

A sale is unnecessary for measuring economic return at the ending market price.

Capital-gains yield is the price change divided by initial price, while dividend yield is the distribution divided by initial price. Total return is their sum, so dividends can partially or fully offset a price decline without guaranteeing a positive return.

With S quoted as domestic currency per foreign currency, divide initial domestic funds by S0, grow the foreign investment, and multiply by S1 to convert back. This cash path determines the exchange-rate ratio. A target domestic return can instead be used to solve for S1.

An unhedged future spot rate remains uncertain; a break-even rate is not a guaranteed forecast.

Exact purchasing-power conversion divides growth factors. Credit spreads subtract the Treasury yield from the corporate yield at the same maturity. A deposit-versus-card problem instead compares the incremental use of the same funds: repayment avoids card interest but sacrifices deposit interest.

The base is the amount repaid, and the saving is the difference rather than the entire card interest.

5. Indexes aggregate prices; institutions support trading

A stock index aggregates a set of companies. The company subscript j and date subscript t distinguish firms and observation times. Price times outstanding shares gives equity market value. A price-weighted index weights by per-share prices; a market-value-weighted index weights by capitalization.

Index points are a normalized scale rather than currency, and an index gain need not equal every constituent's gain.

An index divisor is maintained under the compilation rules. Its initial value follows from the chosen base index. A split or similar nonmarket event requires a new divisor that preserves the index at the event; ordinary market changes must remain visible.

The DJIA is price-weighted, while the S&P 500 covers a broader set of large U.S. companies. Volatility is often measured by return standard deviation. Arithmetic mean return measures average one-period performance; geometric mean measures compound growth. A risk premium is expected return above a comparable risk-free return.

In the test bank's 1926–2003 sample, large stocks have an arithmetic average return of 12.25 percent and standard deviation of 20.5 percent; Treasury bonds have 5.64 and 8.19 percent; and Treasury bills have 3.79 and 3.18 percent.

A separate question identifies small stocks as the highest-average-return category in its historical comparison. Historical averages and volatility describe that sample rather than guarantee future or every-year performance.

Central banks provide domestic currency and core payment support. The Federal Reserve, Bundesbank, and Riksbank name the U.S., German, and Swedish central banks or systems. The SEC regulates securities disclosure and the FASB sets accounting standards.

The BIS supports central-bank cooperation, the IMF addresses international monetary and balance-of-payments cooperation, and the World Bank supports development financing. The 1933 Glass-Steagall Act is a historical regulatory example in the test bank, not a statement that all of its original restrictions remain unchanged today.

C2-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-1

A market that has no one specific location is termed a(n) ____ market.

(a) over-the-counter

(b) geographic location

(c) intermediary

(d) conceptual

C2-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-2

____ problems arise because parties to contracts often cannot easily monitor or control one another.

(a) Payment

(b) Counter

(c) Incentive

(d) Exchange

C2-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-3

Incentive problems take a variety of forms and include:

(a) moral hazard

(b) adverse selection

(c) principal-agent

(d) all of the above

C2-MC-4 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-4

The ____ problem exists when having insurance against some risk causes the insured party to take greater risk or to take less care in preventing the event that gives rise to the loss.

(a) moral hazard

(b) adverse selection

(c) principal-agent

(d) all of the above

C2-MC-5 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-5

Life annuities are examples of ____ problems.

(a) moral hazard

(b) adverse selection

(c) principal-agent

(d) all of the above

C2-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-6

____ means giving the lender the right to seize specific business assets in the event of default.

(a) Increasing moral hazard

(b) Increasing adverse selection

(c) Collateralization of loans

(d) All of the above

C2-MC-7 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-7

____ instruments are also called fixed-income instruments.

(a) Debt

(b) Equity

(c) Derivative

(d) All of the above

C2-MC-8 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-8

The market for short-term debt (less than one year) is called the ____ market, and the market for long-term debt and equity securities is called the ____ market.

(a) capital; money

(b) money; capital

(c) fixed-income; money

(d) derivative; equity

C2-MC-9 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-9

____ securities are financial instruments that derive their value from the prices of one or more other assets.

(a) Debt

(b) Equity

(c) Derivative

(d) Fixed-income

C2-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-10

A call option gives its holder the right to ____ some asset at a specified price on or before some specified expiration date.

(a) sell

(b) buy

(c) loan

(d) borrow

C2-MC-11 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-11

A put option gives its holder the right to ____ some asset at a specified price on or before some specified expiration date.

(a) sell

(b) buy

(c) loan

(d) borrow

C2-MC-12 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-12

____ contracts oblige one party to the contract to buy, and the other party to sell, some asset at a specified price on some specified date.

(a) Options

(b) Uncertainty

(c) Money market

(d) Forward

C2-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-13

The ____ curve depicts the relation between interest rates on fixed-income instruments issued by the U.S. Treasury and the maturity of the instrument.

(a) long-term

(b) short-term

(c) yield

(d) exchange rate

C2-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-14

If the short-term rates are higher than the long-term rates, then the yield curve is ____.

(a) upward sloping

(b) downward sloping

(c) horizontal

(d) vertical

C2-MC-15 概念辨析与短计算

⋆ Bodie 2e 配套题库；C2-MC-15；HW1-Q4

Questions 15 and 16 are intended to be calculated as a pair. Suppose you are a French investor, who wants a safe investment in terms of francs. You are investing for one year and the interest rate on a one-year French government bond is 5% and at the same time it is 9% on a U.S. government bond.

The exchange rate is currently 6.15 French francs to the dollar. Suppose you invest $1,000 in a U.S. bond. Also suppose that a year from now the French franc/dollar exchange rate is 6.50 French francs to the dollar.

What will be the realized French franc rate of return on the U.S. bond?

(a) 5.69%

(b) 9.00%

(c) 15.2%

(d) 7.00%

C2-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-16；HW1-Q4

Use $S_0 = 6.15$ FRF/USD and a one-year USD bond return of 9%, as in C2-MC-15.

In question 15, what would the exchange rate at year's end have to be in order for the French investor to earn exactly 4% per year on the investment in U.S. bonds?

(a) 6.20 FF/$

(b) 5.87 FF/$

(c) 6.40 FF/$

(d) 5.42 FF/$

C2-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-17

Instrument	1–10 years	10+ years
Treasury	5.58%	5.72%
Corporate, high quality	5.98%	6.26%
Corporate, medium quality	6.17%	6.57%

Calculate the yield spread between high-quality corporate bonds and Treasury bonds with maturities of 1–10 years.

(a) 11.56%

(b) 0.68%

(c) 0.59%

(d) 0.40%

C2-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-18

Instrument	1–10 years	10+ years
Treasury	5.58%	5.72%
Corporate, high quality	5.98%	6.26%
Corporate, medium quality	6.17%	6.57%

Calculate the yield spread for Treasury bonds with maturity 10+ years and corporate bonds of medium quality of the same maturity.

(a) 12.29%

(b) 0.85%

(c) 0.54%

(d) 0.45%

C2-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-19

You invest in a stock that costs $45.50 per share. It pays a cash dividend during the year of $1.20 and you expect its price to be $49 at year's end. What is your expected rate of return if you sell the stock for $49 at the end of the year?

(a) 2.64%

(b) 7.69%

(c) 10.33%

(d) –5.05%

C2-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-20

You invest in a stock that costs $45.50 per share. It pays a cash dividend during the year of $1.20 and you expect its price to be $49 at year's end. What is your expected rate of return if you do not sell the stock at the end of the year?

(a) 2.64%

(b) 7.69%

(c) 10.33%

(d) –5.05%

C2-MC-21 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-21

You invest in a stock that costs $45.50 per share. It pays a cash dividend during the year of $1.20 and you expect its price to be $49 at year's end. What is your realized rate of return if the stock's price is actually $42 at year's end?

(a) –5.05%

(b) 18.02%

(c) 10.33%

(d) 5.05%

C2-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-22

The ____ the standard deviation, the ____ the volatility of the rate of return.

(a) higher, lower

(b) lower, higher

(c) higher, higher

(d) none of the above

C2-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-23

____ is an investment strategy that seeks to match the returns of a specified stock market index.

(a) Indexing

(b) Benchmarking

(c) Replicating

(d) Diversifying

C2-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-24

Suppose the risk-free nominal interest rate on a one-year U.S. Treasury bill is 7% per year and the expected rate of inflation is 3% per year. What is the expected real rate of return on the T-bill?

(a) 4%

(b) 3.88%

(c) 1.34%

(d) 3.74%

C2-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-25

Suppose the risk-free nominal interest rate on a one-year U.S. Treasury bill is 6% per year and the expected rate of inflation is 4% per year. What is the expected real rate of return on the T-bill?

(a) 2%

(b) 5%

(c) 1.92%

(d) 1.89%

C2-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-26

Suppose that the real rate of interest on a TIPS is 4.5% per year and the expected rate of inflation in the U.S. is 5% per year. What is the expected nominal rate of return on these bonds?

(a) 0.476%

(b) 4.75%

(c) 9.73%

(d) 9.75%

C2-MC-27 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-27

Currently you have a bank account containing $6,000, which earns interest at a rate of 4% per year. You also have an unpaid balance on your credit card of $3,000 on which you are paying an interest rate of 18% per year. If the time frame is one year, the arbitrage opportunity you face is:

(a) $420

(b) $540

(c) $120

(d) $300

C2-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-28

A ____ interest rate is denominated in units of some currency, whereas a ____ interest rate is denominated in units of some commodity or "basket" of goods and services.

(a) real, nominal

(b) real, treasury

(c) nominal, real

(d) treasury, real

C2-MC-29 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-29

____ are firms whose primary function is to help businesses, governments, and other entities raise funds to finance their activities by issuing securities.

(a) Closed-end funds

(b) Investment banks

(c) Asset management funds

(d) Open-end funds

C2-MC-30 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-30

Currently, you have $24,000 in a bank account earning an interest rate of 4% per year. At the same time you have an unpaid balance on your credit card of $12,000 on which you are paying an interest rate of 18% per year. If the time frame is one year, the arbitrage opportunity you face is:

(a) $2,160

(b) $1,200

(c) $480

(d) $1,680

C2-MC-31 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-31

In the United States, the ____ establishes the precise disclosure requirements that must be satisfied for a public offering of securities.

(a) Financial Accounting Standards Board

(b) World Bank

(c) Federal Reserve

(d) Securities and Exchange Commission

C2-MC-32 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-32

Investment professionals typically use a(n) ____ index as a benchmark for measuring the performance of common stock mutual funds.

(a) inflation adjusted

(b) firm-size weighted

(c) market-weighted

(d) book-weighted

C2-MC-33 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-33

The Dow Jones Industrial Index has some major defects, which include:

(a) It is not broadly diversified enough to accurately reflect the wide spectrum of stocks in the United States.

(b) It corresponds to a portfolio strategy that is unsuitable as a performance benchmark.

(c) It only includes the 30 largest corporations.

(d) (a) and (b)

C2-MC-34 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-34

Interest-rate arbitrage is ____ at a lower rate and ____ at a higher rate.

(a) borrowing, lending

(b) borrowing, defaulting

(c) defaulting, lending

(d) lending, borrowing

C2-MC-35 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-35

____ invest their funds in a new businesses and help the management team get the firm to the point at which it is ready to "go public."

(a) Investment banks

(b) Venture capitalists

(c) Asset management firms

(d) Mutual funds

C2-MC-36 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-36

The case where there is an imbalance in the exchange of information about a business opportunity is known as ____.

(a) information symmetry

(b) information asymmetry

(c) information assets

(d) (a) and (c)

C2-MC-37 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-37

Which of the following represents a defined-contribution pension plan?

(a) pension plan into which the employer and employee make regular contributions.

(b) pension plan whose benefit is determined by a formula that takes into account years of service, wages, and salary.

(c) pension plan whose benefit formula is 1% of retirement salary for each year of service.

(d) All of the above

C2-MC-38 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-38

Which of the following are characteristic of a mutual fund?

(a) professional management

(b) diversification

(c) efficient record keeping and administration

(d) all of the above

C2-MC-39 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-39

Net asset value is defined as the ____.

(a) future value of all assets held divided by the number of shares outstanding

(b) book value of all securities held divided by the number of shares outstanding

(c) market value of all securities held divided by the number of shares outstanding

(d) book value of all assets held divided by the number of shares outstanding

C2-MC-40 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-40

Which of the following describes a money market instrument?

(a) long-term

(b) liquid

(c) high-risk

(d) all of the above

C2-MC-41 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-41

A country's ____ provides the supply of local currency and operates the clearing system for the banks.

(a) stock exchange

(b) underwriter

(c) central bank

(d) investment bank

C2-MC-42 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-42

Which of the following statements is most correct?

(a) open-end mutual funds and closed-end funds are identical

(b) open-end mutual funds stand ready to redeem or issue shares at NAV

(c) closed-end mutual funds stand ready to redeem or issue shares at NAV

(d) mutual funds provide a poor means of diversification

C2-MC-43 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-43

Which of the following statements is most correct?

(a) closed-end mutual funds do not redeem or issue shares at NAV

(b) closed-end mutual fund prices can differ from NAV

(c) shares of closed-end funds are traded through brokers

(d) all of the above are correct

C2-MC-44 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-44

In the United States, the ____ prohibited commercial banks from engaging in most underwriting activities.

(a) Investment Bank Act of 1909

(b) SEC Act

(c) Glass Steagall Act of 1933

(d) Commercial Bank Act of 1952

C2-MC-45 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-45

Rules for trading securities serve the function of ____.

(a) recognizing when government inaction is the best choice

(b) standardizing procedures to keep transaction costs low

(c) presenting financial information in a standardized format

(d) establishing arbitrary rules to ensure the maximum revenue from transaction fees

C2-MC-46 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-46

In Germany, the central bank is called the ____.

(a) Riksbank

(b) Bundesbank

(c) Bank of Germany

(d) Exchequer

C2-MC-47 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-47

For the period 1926-2003, which of the following asset classes provided the highest average rate of return?

(a) Long-term U.S. Treasury bonds

(b) U.S. T-bills

(c) Inflation

(d) Small stock

C2-MC-48 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-48

For the period 1926-2003, which of the following asset classes provided the lowest volatility of the rate of return?

(a) Long-term U.S. Treasury bonds

(b) U.S. T-bills

(c) Inflation

(d) Small stock

C2-MC-49 概念辨析与短计算

Bodie 2e 配套题库；C2-MC-49

The ____ is the unit of account for computing the real rate of return.

(a) nominal interest rate on stock

(b) standardized basket of consumption goods

(c) country's rate of inflation

(d) none of the above

C2-SHORT-2 方法练习

Bodie 2e 配套题库；C2-SHORT-2

Instrument	1–10 years	10+ years
Treasury	5.58%	5.72%
Corporate, high quality	5.98%	6.26%
Corporate, medium quality	6.17%	6.57%

Calculate the yield spread for Treasury bonds with maturity 10+ years and corporate bonds of high quality of the same maturity.

C2-SHORT-3 方法练习

Bodie 2e 配套题库；C2-SHORT-3

Instrument	1–10 years	10+ years
Treasury	5.58%	5.72%
Corporate, high quality	5.98%	6.26%
Corporate, medium quality	6.17%	6.57%

Calculate the yield spread for Treasury bonds with maturity 1-10 years and corporate bonds of medium quality of the same maturity.

C2-SHORT-5 方法练习

Bodie 2e 配套题库；C2-SHORT-5

You invest in a stock that costs $42.50 per share. It pays a cash dividend during the year of $1.80 and you expect its price to be $45 at year's end. What is your expected rate of return if you sell the stock for $45 at the end of the year?

C2-SHORT-6 方法练习

Bodie 2e 配套题库；C2-SHORT-6

Use $P_0 = 42.50$, annual $Div = 1.80$, and expected $P_1 = 45$, as in C2-SHORT-5. Refer to Question 5. What if you do not sell the stock at the end of the year?

C2-SHORT-7 方法练习

Bodie 2e 配套题库；C2-SHORT-7

You invest in a stock that costs $42.50 per share. It pays a cash dividend during the year of $1.80 and you expect its price to be $45 at year's end. What is your realized rate of return if the stock's price is actually $39 at year's end?

C2-SHORT-8 方法练习

Bodie 2e 配套题库；C2-SHORT-8

Suppose the risk-free nominal interest rate on a one-year U.S. Treasury bill is 5% per year and the expected rate of inflation is 3%. What is the expected real rate of return on the T-bill?

C2-SHORT-9 方法练习

Bodie 2e 配套题库；C2-SHORT-9

Suppose you are a Dutch investor, who wants a safe investment in terms of Guilders. You are investing for one year and the interest rate on a one-year Netherlands government bond is 6% and at the same time it is 9% on a U.S. government bond. The exchange rate is currently 2.05 Guilders to the dollar.

Suppose you invest $1,000 in a U.S. bond. Also suppose a year from now that the Guilder/dollar exchange rate is 2.15 Guilders to the dollar. What will be the realized Dutch rate of return on the U.S. bond?

C2-SHORT-10 方法练习

Bodie 2e 配套题库；C2-SHORT-10

Use $S_0 = 2.05$ ANG/USD and a one-year USD bond return of 9%, as in C2-SHORT-9. Refer to Question 9. What does the exchange rate have to be at year's end for the Dutch investor to earn exactly 12% per year on the investment in U.S. bonds?

C2-SHORT-17 方法练习

Bodie 2e 配套题库；C2-SHORT-17

You invest in a stock costing $60 per share. It pays a cash dividend during the year of $2.50, and you expect its price to be $85 at year's end. Calculate your expected rate of return. If the stock price at the end of the year is actually $50, calculate your realized rate of return.

C2-SHORT-18 方法练习

Bodie 2e 配套题库；C2-SHORT-18

You invest in a stock costing $45 per share. It pays a cash dividend of $3.20 during the year, and you expect its price to be $60 at the end of the year. If the price is actually $42 at the end of the year, calculate your realized rate of return.

C2-SHORT-19 方法练习

Bodie 2e 配套题库；C2-SHORT-19

Suppose you have $15,000 in a bank account earning an interest rate of 5% per year. At the same time you have an unpaid balance on your credit card of $8,000 for which you are paying 18% interest. What is the arbitrage opportunity you face?

C2-SHORT-20 方法练习

Bodie 2e 配套题库；C2-SHORT-20

Suppose the real rate of interest on a TIPS is 4% per year, and the expected U.S. inflation rate is 3.5% per year. What is the expected nominal rate of return on these bonds?

C2-LONG-3 综合计算

Bodie 2e 配套题库；C2-LONG-3

Suppose that you have $30,000 in a bank account earning an interest rate of 6% per year. At the same time you have an unpaid balance on your credit card of $14,000 on which you are paying an interest rate of 18% per year. What is the arbitrage opportunity you face?

C2-LONG-3 Working space

C2-LONG-4 综合计算

Bodie 2e 配套题库；C2-LONG-4

Use the data below to compute both the DJIA-type price-weighted index and the market-value-weighted index for a hypothetical two-stock index. Set the base-year index to 100. Discuss what each index measures.

Stock	Base price	Current price	Shares (million)
1	20	30	100
2	10	2	50

C2-LONG-4 Working space

C2-LONG-5 综合计算

Bodie 2e 配套题库；C2-LONG-5

You invest in a stock that pays $2 per quarter and costs you $50.50 per share. At the end of the year you expect the stock price to be $59.50. What is the expected rate of return on this stock? What is the realized rate of return if the price of the stock is $52 at the end of the year?

C2-LONG-5 Working space

C2-LONG-10 综合计算

Bodie 2e 配套题库；C2-LONG-10

Use the data below to compute both the DJIA-type price-weighted index and the market-value-weighted index for a hypothetical two-stock index. Set the base-year index to 100. Discuss what each index measures.

Stock	Base price	Current price	Shares (million)
1	110	60	200
2	60	120	100

C2-LONG-10 Working space

F-HW02-05 金融五篇大文章

Five Major Areas of Financial Work

⋆ 2026 HW2；Part I 5

Which is NOT among Five Major Areas of Financial Work (金融五篇大文章) in China?

A. Fintech

B. Green Finance

C. Inclusive Finance

D. Pension Finance

E. Digital Finance

第 4 章　货币的时间价值

The Time Value of Money

依据：Bodie 2e Ch4；Chapter 4 课程资料

现金流时点 → 利率口径 → 年金等值 → 贷款余额 → 估值与换币

4.1　现金流与估值日期

Cash flows acquire value at a specified date

> **PRINCIPLE**　先定收付日期，再把全部现金流换算到同一估值日。

现金流（cash flow）CF_t 是第 t 期实际净收付；钱来自工资、客户、租客、债券发行人或其他合同方，公式不会创造额外收入。从同一投资者角度，流入（inflow）记正，流出（outflow）记负，第 0 期是今天。**现值**（present value / PV）与**终值**（future value / FV）是同一笔钱在不同日期的等值金额。货币时间价值（time value of money）要求先把收付转换到同一日期，再比较或相加。

$$FV_n = PV(1+i)^n, \qquad PV = \frac{FV_n}{(1+i)^n},$$
$$i = (FV_n/PV)^{1/n} - 1, \qquad n = \frac{\ln(FV_n/PV)}{\ln(1+i)}.$$

i 为**每期有效利率**，n 为相同期间的次数。ln 是自然对数，用于解指数中的未知数。**复利**（compounding）逐期乘增长因子，**贴现**（discounting）逐期除；负指数是倒数，不是负金额。等值变换具有线性，因此每笔回款可分别贴现后相加；变动利率则逐期累乘 $(1+i_1)(1+i_2)\cdots$，不能拿最后一年利率覆盖全部年份。

$$PV_0 = \sum_{t=0}^{n} \frac{CF_t}{(1+i)^t}, \qquad FV_n = \sum_{t=0}^{n} CF_t(1+i)^{n-t}.$$

4.2 年化报价、期间利率与有效年率

A quoted annual rate is not a period rate

> **PRINCIPLE** 期间利率匹配期数；APR 是报价，EAR 包含年内复利。

APR（annual percentage rate，年度百分比报价）在本题库按年内每次**期间利率**的简单年化报价处理；EAR（effective annual rate，**有效年利率**），也写 EFF，包含一年内全部**复利**。每年计息 m 次时，期间利率为 APR/m，T 年共 mT 期。Semiannually、quarterly、monthly、daily 分别为半年、季度、月、日；本册日复利采用题设 365 次。所谓 nominal 有时指未包含年内复利效果的报价，有时指未扣通胀的购买力口径，两种用法必须按上下文区分。

$$
\begin{aligned}
i_{period} &= APR/m, \\
EAR &= (1 + APR/m)^{m} - 1, \\
FV &= PV(1 + APR/m)^{mT}.
\end{aligned}
$$

若题目直接给 EAR，每月等效利率应为 $(1+EAR)^{1/12}-1$，而非 EAR 除 12。贷款先按还款频率求月利率 i_m，再分别给 $APR = 12i_m$ 与 $EAR = (1+i_m)^{12}-1$。**连续复利**（continuous compounding）是频率增加而每次利率缩小的极限：$FV = PVe^{kT}$，其中 e 为自然常数、k 为连续复利年率。倍增时间（doubling time）精确为 $\ln 2/\ln(1+i)$，72 法则（Rule of 72）用 72 除百分数年率作近似。

4.3 年金是现金流的排列方式

An annuity is a pattern of payments

> **PRINCIPLE** 每期金额乘年金因子得到总价值；反求付款就除因子。

年金（annuity）不是凭空多出的钱，而是等间隔支付序列，常见来源是固定工资、租金、贷款还款或储蓄缴存。**普通年金**（ordinary annuity）在第 1 至第 n 期末各付 PMT；PMT 是每期金额。**年金现值因子**（annuity present-value factor）$a_n(i)$ 是未来每期 1 元的**现值**，年金终值因子（annuity accumulation factor）$s_n(i)$ 是相同序列第 n 期的终值。

$$a_n(i)=\sum_{t=1}^{n}(1+i)^{-t}=\frac{1-(1+i)^{-n}}{i},\qquad s_n(i)=\sum_{k=0}^{n-1}(1+i)^{k}=\frac{(1+i)^n-1}{i}.$$

现值因子的原理是有限等比求和：令 $A=(1+i)^{-1}+\cdots+(1+i)^{-n}$，将 $(1+i)A$ 与 A 相减，中间项抵消，得 $iA=1-(1+i)^{-n}$。把现值再滚到第 n 期即得**终值**。利率为零时两因子均取 n。这也解释为何已知总金额求付款要除因子，而非乘因子。

$$PV=PMT\,a_n(i),\quad FV_n=PMT\,s_n(i),\quad PMT=PV/a_n(i)=FV_n/s_n(i).$$

期初年金（annuity due）在第 0 至第 $n-1$ 期支付，每笔提前一期，因此**现值**和同一终点的**终值**均比普通年金多乘 $1+i$。递延年金（deferred annuity）若首笔在 $k+1$，普通年金现值先算在 k，再折回今天。年金直接估值点总在首笔普通付款前一期；生日当天付款要当作该时点现金，不能再贴现一期。

$$PV_{due}=PMT\,a_n(i)(1+i),\qquad PV_{deferred,0}=PMT\,a_n(i)(1+i)^{-k}.$$

永续年金（perpetuity）在每期末永久付相同金额，正利率下**现值**为 PMT/i。**增长年金**（growing annuity）首笔 PMT_1 在一期后，以比例 g 增长，共 n 笔；贴现后公比为 $(1+g)/(1+i)$。增长永续年金（growing perpetuity）仅在 $i>g$ 时收敛。若每期增加固定金额 G，则是算术梯度（arithmetic gradient），不是按比例增长；应列 $A+(t-1)G$ 的逐期和。

$$PV_{growth}=\frac{PMT_1}{i-g}\left[1-\left(\frac{1+g}{1+i}\right)^{n}\right],\quad i\neq g,$$
$$PV_{growth,\infty}=\frac{PMT_1}{i-g},\qquad\qquad i>g.$$

当 $i=g$，有限**增长年金**每一项**贴现**后均为 $PMT_1/(1+i)$，故**现值**为 $nPMT_1/(1+i)$。立即奖金单独加在第 0 期，不纳入一年后开始的工资年金。退休、教育、分阶段计划先选择连接日期，再把两边资源都移动到该日，避免首末付款错一笔。

4.4 贷款余额与剩余付款

A loan balance is the value of remaining obligations

> **PRINCIPLE** 余额是剩余还款的现值；固定还款先付利息，再还本金。

本金（principal）是贷款所欠金额，**未偿余额**（outstanding balance）B_t 表示第 t 次付款后尚欠本金。**摊还贷款**（amortized loan）的每笔付款包含利息与本金。银行今天付出 L，未来收取 n 笔 PMT，按合同利率等值要求 $L = PMTa_n(i)$，所以 $PMT = L/a_n(i)$；只有零利率时才为 L/n。

$$
\begin{aligned}
Interest_t &= iB_{t-1}, \\
Principal_t &= PMT - iB_{t-1}, \\
B_t &= (1+i)B_{t-1} - PMT, \qquad B_0 = L, \\
B_k &= PMTa_{n-k}(i) \\
&= L(1+i)^k - PMTs_k(i).
\end{aligned}
$$

向后看，余额等于未来剩余付款在该时点的**现值**；向前看，余额等于原**本金**累计值减已还款累计值。固定总付款不等于固定本金偿还额：余额递减时利息下降，本金部分上升。额外还款（extra payment）先改变未来付款，再反求剩余期数；重组（reorganization）先算旧余额，再应用债权减记和新期限。**贴现**点数或贷款预付费用（discount points）使净收到款低于名义本金，真实融资成本应按净收款与实际还款反推。

$$
N = -\frac{\ln(1 - Bi/PMT)}{\ln(1+i)}, \qquad PMT > Bi,\ i > 0.
$$

最接近整数的期数与实际结清所需付款次数不同。若连续解为 281.007 个月，四舍五入为 281，但按整月付款仍可能需要第 282 次小额尾款。摊销表的核验是最后余额约零、**本金**偿还合计等于原本金、总利息等于总付款减本金；中间计算保留完整精度。

4.5 净现值、内部收益率、通胀与税收

NPV, IRR, inflation and taxes

> **PRINCIPLE** NPV 衡量财富增量；IRR 使 NPV 为零；名义与实际口径须匹配。

资本机会成本（opportunity cost of capital）是放弃可比风险投资的回报；要求收益率（required return）、**贴现**率（discount rate）、项目门槛率（hurdle rate）在相容条件下承担这一估值作用。**净现值**（NPV）把全部增量收付折到今天，衡量财富变化。内部收益率（IRR）由现金流本身确定，是令 NPV 为零的未知贴现率。静态回收期（payback period）是未贴现回款收回投入所需时间，贴现回收期（discounted payback period）先贴现再累计；两者均可能忽略回收截止后的收益。

$$NPV(r)=\sum_{t=0}^{n} CF_t/(1+r)^t, \qquad NPV(IRR)=0.$$

今天流出、以后非负流入的常规**独立项目**，NPV 随**贴现**率增加而降低，因此 $NPV(r)>0 \iff IRR>r$。多次变号可能产生多 IRR 或无合适根，**互斥项目**不能一般按 IRR 排名。缺一笔现金流时，从目标 NPV 减去其他现金流现值，再复利回缺失时点；无论它是第几年，都不可把将来金额直接与今天 NPV 相加。

通胀率（inflation rate）π 衡量消费篮子物价增长。**名义回报**先形成货币增长，再除物价增长，给出 Fisher 关系。可抵扣费用（tax-deductible expense）减少应税收入，**税盾**（tax shield）只是减少的税款 τX，不是费用全额免付。按利息征税时，税后名义收益率为 $i(1-\tau)$，本金不应每年重新纳税；再除物价因子才是税后实际回报。

$$1+i_N=(1+i_R)(1+\pi), \qquad i_{R,after}=\frac{1+i_N(1-\tau)}{1+\pi}-1.$$

4.6 跨币种估值与远期汇率

Currency-consistent valuation and forward rates

> **PRINCIPLE** 先统一货币再估值；远期汇率今天约定、未来交割。

即期汇率（spot exchange rate）S_0 是今天换币报价；**远期汇率**（forward exchange rate）$F_{0,T}$ 是今天签约、未来 T 交割的约定报价，F 表示 forward，而外币利率 r_F 下标 F 表示 foreign。以本币/外币报价时，两条锁定路径分别是本币直接投资、换外币投资后按远期换回。无**套利**要求两条同风险同期限的确定终值相等，得到抛补利率平价（covered interest parity）。

$$V_0(1+r_D)^T = (V_0/S_0)(1+r_F)^T F_{0,T} \Rightarrow F_{0,T} = S_0\frac{(1+r_D)^T}{(1+r_F)^T}.$$

未来**即期汇率** S_T 与今天锁定的**远期汇率**不是同一概念。未来使两种未锁汇投资无差异的临界 S_T^* 可与上式同值，但不是未来市场的保证结果。外币项目则先按匹配外币与风险的资本成本求今天外币**现值**，再乘今天 S_0 转本币；资本预算比较应扣掉本币初始投入。

$$NPV_D = -I_{0,D} + S_0\sum_{t=1}^{n}\frac{CF_{F,t}}{(1+r_F)^t}.$$

4.7 英文概念与原理

English Definitions and Principles

1. Cash flows acquire value at a specified date

A cash flow is a net receipt or payment at a specified time. It comes from an employer, customer, tenant, security issuer, or other counterparty; valuation creates no extra payment. From a fixed investor's viewpoint, inflows are positive, outflows negative, and time zero is today.

Present and future values are equivalent amounts at different dates. The time value of money requires payments to be moved to one valuation date before comparison or addition.

The effective rate i and number of periods n must use the same period length. The natural logarithm solves for an unknown exponent. Compounding multiplies growth factors and discounting divides them; a negative exponent denotes a reciprocal, not a negative payment. Because valuation is linear, individual values add.

With changing rates, multiply the period-specific growth factors rather than apply the final rate to every year.

2. A quoted annual rate is not a period rate

In this test bank, APR is the annual quote obtained by simple annualization of the period rate. EAR, also called EFF, includes all within-year compounding. With m compounding periods per year, the period rate is APR divided by m and T years contains mT periods.

Semiannual, quarterly, monthly, and daily compounding use the relevant frequency; daily examples here use 365. Nominal can refer either to an annual quote before compounding or to a monetary return before inflation adjustment. These are different distinctions.

If EAR is given, the equivalent monthly rate is its twelfth-root growth factor minus one, not EAR divided by twelve. For a loan, first solve the rate at the payment frequency, then report APR and EAR separately.

Continuous compounding is the limit of increasingly frequent, increasingly small interest credits, giving an exponential growth factor. The exact doubling

time uses logarithms; the Rule of 72 approximates it by dividing 72 by the annual percentage rate.

3. An annuity is a pattern of payments

An annuity is a pattern of regularly spaced payments, not an extra source of money. Wages, rent, loan payments, and savings contributions can form annuities. An ordinary level annuity pays PMT at the ends of periods one through n. PMT is an amount per period.

The present-value factor values one unit per period today; the accumulation factor values the same payments at period n.

The factor follows from a finite geometric sum. Multiplying the discount-factor sum by one plus i and subtracting the original sum cancels the middle terms. Moving the resulting present value to period n gives the accumulation factor. At a zero rate both factors equal n.

Solving for the payment divides a total value by its factor because the total is the payment multiplied by that factor.

An annuity due pays at times zero through n minus one. Every payment is one period earlier, so both present value and value at a common terminal date multiply the ordinary factor by one plus i. For a deferred annuity with its first payment at k plus one, the ordinary factor gives value at time k, which must then be discounted to today.

A payment made on the valuation birthday is an immediate amount, not a payment one year later.

A perpetuity pays a constant amount indefinitely, beginning one period later, and has value PMT divided by a positive rate. A growing annuity starts with a payment one period later and increases it by a constant percentage g for n payments; its discounted terms form a geometric series.

A growing perpetuity converges only when the discount rate exceeds the growth rate. A fixed currency increase is instead an arithmetic gradient and must not be treated as percentage growth.

When the two rates are equal, each discounted term of the finite growing annuity is the same, giving n times the first payment divided by one plus i. An immediate

bonus is added separately at time zero rather than included as another future wage.

Multistage retirement or education plans require a connecting date at which resources and uses are valued together, with the first and last payments counted explicitly.

4. A loan balance is the value of remaining obligations

Principal is the loan amount owed, and the outstanding balance after payment t is the remaining principal. Each amortizing payment covers interest and principal. The lender's initial outflow must equal the value of contractual receipts at the loan rate, which determines the level payment by division by the annuity factor.

Dividing principal by the number of payments alone is valid only at zero interest.

Looking forward, the balance is the present value of remaining payments; looking backward, it is accumulated initial principal less accumulated payments already made. A level total payment does not imply level principal repayment: interest falls and principal repayment rises as the balance declines.

Extra payments change the future payment stream and remaining term. Reorganization first values the old balance, then applies any write-down and new terms. Upfront discount points reduce net proceeds and increase the rate inferred from actual net receipts and payments.

The nearest integer term differs from the actual number of scheduled payments required for payoff. A fractional solution slightly above 281 rounds to 281 but can require a small 282nd payment.

An amortization table should end near zero, principal repayments should sum to the original loan, and total interest should equal total payments less principal. Intermediate calculations should retain precision.

5. NPV, IRR, inflation and taxes

The opportunity cost of capital is the return forgone on a comparable-risk alternative. A required return, discount rate, or hurdle rate serves this valuation role under compatible assumptions. NPV measures the change in present wealth from all incremental payments. IRR is determined by the cash flows and makes NPV zero.

The payback period uses undiscounted recovery, while discounted payback first discounts receipts. Both can ignore cash flows after the recovery cutoff.

For a conventional independent project with an initial outflow and subsequent nonnegative inflows, NPV decreases as the discount rate rises, making the positive-NPV and above-hurdle-IRR rules equivalent. Multiple sign changes can produce multiple roots or no useful root, and IRR generally cannot rank mutually exclusive projects.

To recover a missing payment, subtract all known present values from target NPV, then compound the residual to the missing payment's date.

Inflation measures the growth of the consumption-basket price. Dividing the monetary growth factor by the price growth factor gives the Fisher relation. A tax-deductible expense reduces taxable income; its tax shield is the tax saved, not reimbursement of the entire expense.

When interest is taxed, after-tax nominal interest is reduced by the tax rate, while principal is not taxed again each year. Purchasing-power adjustment is applied to the after-tax growth factor.

6. Currency-consistent valuation and forward rates

A spot exchange rate quotes an exchange today. A forward exchange rate is agreed today for delivery at a future date; its F denotes forward, whereas the subscript on the foreign interest rate denotes foreign.

With rates quoted as domestic currency per foreign unit, compare direct domestic investment with foreign investment whose conversion back is locked by a forward contract. No arbitrage equates the two comparable, certain terminal values, producing covered interest parity.

The future spot rate and a forward rate fixed today are distinct. A break-even future spot rate can equal the forward-parity expression without being a guaranteed future market rate. A foreign project is valued first in its own currency at a compatible discount rate, then its present value is converted at today's spot rate.

The domestic initial investment is deducted before comparing project NPVs.

C4-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-1

____ is the process of going from present value to future value, whereas ____ is finding the present value of some future amount.

(a) Discounting; compounding

(b) Compounding; annualizing

(c) Compounding; discounting

(d) Discounting; leasing

C4-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-2

____ refers to the interest rate at which money received before the end of the planning horizon can be reinvested.

(a) Internal rate

(b) Reinvestment rate

(c) Cost of equity

(d) Compound interest

C4-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-3

The difference between an immediate annuity and an ordinary annuity is ____.

(a) the number of periods

(b) the amount of the payments

(c) the interest rate

(d) the timing of the payments

C4-MC-4 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-4

The preferred stock of Tavistock Realty offers a cash dividend of $2.28 per year and it is selling at a price of $110 per share. What is the yield of Tavistock Realty preferred stock?

(a) 2.07%

(b) 2.12%

(c) 2.28%

(d) 48.25%

C4-MC-5 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-5

Consider the situation where you have won a $10 million lottery to be received in 25 annual equal payments of $400,000.

What will happen to the present value of these winnings if the interest rate increases during the next 25 years?

(a) it will not change

(b) it will be worth more

(c) it will be worth less

(d) it cannot be determined

C4-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-6

What is the effective annual rate on a bank account that has APR of 8 percent with interest compounded quarterly?

(a) 6.12%

(b) 8.24%

(c) 8.48%

(d) 17.17%

C4-MC-7 概念辨析与短计算

⋆ Bodie 2e 配套题库；C4-MC-7；HW1-Q6

You take out a loan with an APR of 10% with monthly compounding. What is the effective annual rate on your loan?

(a) 10.47%

(b) 21.6%

(c) 19.56%

(d) 18%

C4-MC-8 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-8

The CFO of CyberHelp Inc. has $250,000 in cash today that he wants to invest. How much will this investment be worth in four years if the current interest rate is 8%?

(a) $270,000

(b) $330,000

(c) $340,125

(d) $342,150

C4-MC-9 概念辨析与短计算

⋆ Bodie 2e 配套题库；C4-MC-9；HW1-Q1

If you purchase a $12,000 certificate of deposit today with an APR of 14%, with quarterly compounding, what will the CD be worth when it matures in 5 years?

(a) $20,846.99

(b) $20,865.60

(c) $23,104.97

(d) $23,877.47

C4-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-10

The CFO of CyberChain Inc. plans to unleash a media campaign that is expected to cost $15 million four years from today. How much cash should she set aside to pay for this if the current interest rate is 13%?

(a) $9.2 million

(b) $13.3 million

(c) $14.4 million

(d) $16.9 million

C4-MC-11 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-11

The NPV is a measure of how much your ____ wealth changes as a result of your choice and if the NPV is ____it does not pay to undertake that choice.

(a) future; negative

(b) current; negative

(c) current; positive

(d) future; positive

C4-MC-12 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-12

The ____ is the rate that one can earn somewhere else if one did not invest in the project under evaluation.

(a) opportunity cost of capital

(b) cost of debt

(c) cost of equity

(d) weighted average cost of capital

C4-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-13

You are trying to decide whether or not to buy a bond for $990 that will make one payment for $1,050 four years from today. What is the internal rate of return on the bond's cash flows?

(a) 1.06%

(b) 1.48%

(c) 10.6%

(d) 14.8%

C4-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-14

Calculate the NPV of the following cash flows: you invest $3,000 today and receive $300 one year from now, $700 two years from now, and $1,100 starting four years from now. Assume that the interest rate is 7%.

(a) –$1,962.62

(b) –$1,269.04

(c) $1,269.04

(d) $1,962.62

C4-MC-15 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-15

After each payment of an amortized loan, the outstanding balance is reduced by the amount of principal repaid.

Therefore, the portion of the payment that goes toward the payment of interest is ____ than the previous period's interest payment and the portion going toward repayment of principal is ____ than the previous period's.

(a) greater; lower

(b) lower; lower

(c) greater; greater

(d) lower; greater

C4-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-16

The present value of a future amount can be calculated with the equation ____.

(a) $PV = FV(1+i)^n$

(b) $FV = PV(1+i)n$

(c) $PV = \dfrac{FV}{(1+i)^n}$

(d) $PV = \dfrac{FV}{(1+i)n}$

C4-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-17

To compute the future value of a present amount use the compound amount factor defined as ____.

(a) $FV = PV(1+i)^n$

(b) $FV = PV(1+i)n$

(c) $PV = \dfrac{FV}{(1+i)^n}$

(d) $PV = \dfrac{FV}{(1+i)n}$

C4-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-18

The earnings of BGB Computers have grown from $3.20 to $6.90 in 6 years. Determine the annual compound rate.

(a) 1.14%

(b) 13.7%

(c) 15.6%

(d) 115.6%

C4-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-19

In five years you intend to go to graduate school. For each of your four years in graduate school, you need to have a fund that will provide $25,000 per year at the beginning of each year. If the interest rate is 9% throughout, how much must you put in the fund today?

(a) $64,996

(b) $57,379

(c) $50,184

(d) $16,249

C4-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-20

As part of your new job at CyberInc. the company is providing you with a new Jeep. Your firm will lease this $34,000 Jeep for you. The terms of the lease are seven annual payments at an interest rate of 10%, which will fully amortize the cost of the car. What is the annual lease payment?

(a) $6,984.39

(b) $5,342.86

(c) $4,857.14

(d) $3,584.00

C4-MC-21 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-21

A rule of thumb with using the internal rate of return is to invest in a project if the IRR is ____ the opportunity cost of capital.

(a) greater than

(b) less than

(c) less than or equal to

(d) one-half of

C4-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-22

When considering the timeframe of an investment, a rule followed by some is to choose the investment with ____ payback period.

(a) the longest

(b) the shortest

(c) no

(d) an infinite

C4-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-23

A major problem with using the internal rate of return rule is ____.

(a) there may be multiple cash outflows and multiple cash inflows

(b) the internal rate of return may not exist

(c) the internal rate of return may not be unique

(d) all of the above

C4-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-24

The NPV is the difference between the ____ value of all ____ cash inflows minus the ____ value of all current and future cash outflows.

(a) future; present; present

(b) present; future; present

(c) present; present; future

(d) present; future; future

C4-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-25

When considering effective interest rates, as the compounding frequency increases, the effective annual rate gets ____ and ____ but approaches ____.

(a) larger; larger; a limit

(b) smaller; smaller; a limit

(c) larger; larger; infinity

(d) smaller; smaller; infinity

C4-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-26

In 10 years you wish to own your business. How much will you have in your bank account at the end of 10 years if you deposit $300 each quarter (assume end of the period deposits)? Assume the account is paying an interest rate of 12% compounded quarterly.

(a) $20,220

(b) $21,060

(c) $21,626

(d) $22,620

C4-MC-27 概念辨析与短计算

⋆ Bodie 2e 配套题库；C4-MC-27；HW1-Q2

The director of marketing for CyberProducts Inc. plans to unleash a media blitz that is expected to cost $4.7 million three years from today. How much cash should she set aside today to pay for this if the current interest rate is 11%?

(a) $6.43 million

(b) $4.23 million

(c) $3.62 million

(d) $3.44 million

C4-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-28

If you purchased a $10,000 certificate of deposit today with an APR of 12%, with monthly compounding, what would be the CD worth when it matures in 6 years?

(a) $56,340

(b) $20,468

(c) $19,738

(d) $5,066

C4-MC-29 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-29

The manufacturing manager of CyberProducts Inc. estimates that she can save the company $16,000 cash per year over the next 8 years by implementing a recycling plan. What is the value of the savings today if the appropriate interest rate for the firm is 9%? Assume cash flows occur at the end of the year.

(a) $64,240

(b) $88,557

(c) $96,527

(d) $128,000

C4-MC-30 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-30

If the exchange rate between the U.S. dollar and the French Franc is $0.17 per French Franc, the dollar interest rate is 5.5% per year, and the French Franc interest rate is 4.5% per year, what is the "break-even" value of the future dollar/French Franc exchange rate one year from now?

(a) $0.172 per FF

(b) $0.179 per FF

(c) $5.827 per FF

(d) $5.882 per FF

C4-MC-31 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-31

In any time value of money calculation, the cash flows and the interest rate must be denominated ____.

(a) in the same currency

(b) in different currencies

(c) in terms of a third currency

(d) in terms of the ECU

C4-MC-32 概念辨析与短计算

⋆ Bodie 2e 配套题库；C4-MC-32

If the exchange rate between the U.S. dollar and the Japanese yen is $0.00745 per yen, the dollar interest rate is 6% per year, and the Japanese interest rate is 7% per year, what is the "break-even" value of the future dollar/yen exchange rate one year from now?

(a) $135.49 per yen

(b) $134.23 per yen

(c) $0.00752 per yen

(d) $0.00738 per yen

C4-MC-33 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-33

Consider the situation where you are trying to decide if you should invest in a Swiss project or an American project. Both projects require an initial outlay of $15,000. The Swiss project will pay you 17,100 Swiss Francs per year for 6 years, whereas the American one will pay you $11,000 per year for 6 years.

The dollar interest rate is 5% per year, the Swiss Franc interest rate is 6% per year, and the current dollar price of a Swiss Franc is $0.68 per Swiss Franc. Which project has the higher NPV?

(a) the U.S. project; its NPV is $55,832

(b) the U.S. project; its NPV is $40,833

(c) the Swiss project; its NPV is $42,179

(d) the Swiss project; its NPV is $57,178

C4-MC-34 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-34

The ____ is the rate denominated in dollars or in some other currency, and the ____ is denominated in units of consumer goods.

(a) nominal interest rate; inflation interest rate

(b) nominal interest rate; real interest rate

(c) real interest rate; inflation interest rate

(d) real interest rate; nominal interest rate

C4-MC-35 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-35

Consider the situation where you are trying to decide if you should invest in a British project or U.S. project. Both projects require an initial outlay of $55,000. The British project will pay you 30,000 pounds per year for 6 years, whereas the American one will generate $40,000 per year for 6 years.

The British interest rate is 5% per year, and the American interest rate is 6% per year; the current dollar price of a pound sterling is $1.6320 per pound sterling. Which project has the higher NPV?

(a) choose the U.S. one, it has a NPV of $196,693

(b) choose the U.S. one, it has a NPV of $141,693

(c) choose the British one, it has a NPV of $248,506

(d) choose the British one, it has a NPV of $193,506

C4-MC-36 概念辨析与短计算

⋆ Bodie 2e 配套题库；C4-MC-36；HW1-Q5

What is the real interest rate if the nominal interest rate is 9% per year and the rate of inflation is 6% per year?

(a) 1.5%

(b) 2.75%

(c) 2.83%

(d) 7.5%

C4-MC-37 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-37

What is the nominal interest rate if the real rate of interest is 4.5% and the rate of inflation is 6% per year?

(a) 10.5%

(b) 10.77%

(c) 10.86%

(d) 14.5%

C4-MC-38 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-38

What is the real rate of interest if the inflation rate is 6% per year and the nominal interest rate per year is 12.5%?

(a) 1.32%

(b) 6.13%

(c) 5.78%

(d) 11.79%

C4-MC-39 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-39

Compute the real future value, to the nearest dollar, of $2,000 in 35 years time. The real interest rate is 3.2%, the nominal interest rate is 8.36%, and the rate of inflation is 5%.

(a) $6,023

(b) $6,853

(c) $33,223

(d) $11,032

C4-MC-40 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-40

The real interest rate is 3.2%, the nominal interest rate is 8.36% and the rate of inflation is 5%. We are interested in determining the future value of $200 in 35 years time. What is the future price level?

(a) 2.91

(b) 3.012

(c) 5.516

(d) 16.61

C4-MC-41 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-41

Suppose your child is 9 years old and you are planning to open a fund to provide for the child's college education. Currently, tuition for one year of college is $22,000. How much must you invest now in order to pay enough for the first year of college nine years from now, if you think you can earn a rate of interest that is 4% more than the inflation rate?

(a) $21,154

(b) $16,988

(c) $15,585

(d) $15,457

C4-MC-42 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-42

Suppose you have a child who is 10 years old and you are planning to open a fund to provide for the child's college education. Currently, tuition for one year is $22,000. Your child is planning to travel for two years before starting college. How much must you invest now in order to pay enough for the first year of college ten years from now, if you think you can earn a rate of interest that is 5% more than the inflation rate?

(a) $10,190

(b) $13,506

(c) $13,660

(d) $20,952

C4-MC-43 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-43

When considering a plan for long run savings, if one does not have an explicit forecast of inflation, then one can make plans in terms of:

(a) constant real payments and a real rate of interest

(b) constant nominal payments and a nominal rate of interest

(c) constant real payments and a nominal rate of interest

(d) constant nominal payments and a real rate of interest

C4-MC-44 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-44

If the real rate is 4% and the rate of inflation is 6%, what is the nominal rate?

(a) 8.16%

(b) 10.16%

(c) 10.24%

(d) 10.36%

C4-MC-45 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-45

You have an investment opportunity with a nominal rate of 6% compounded daily. If you want to have $100,000 in your investment account in 15 years, how much should you deposit today, to the nearest dollar?

(a) $43,233

(b) $41,727

(c) $40,930

(d) $40,660

C4-MC-46 概念辨析与短计算

Bodie 2e 配套题库；C4-MC-46

You have determined the present value of an expected cash inflow stream.

Which of the following would cause the stream to have a higher present value?

(a) The discount rate increases.

(b) The cash flows are paid over a shorter period of time.

(c) The discount rate decreases.

(d) Statements (b) and (c) are both correct.

C4-SHORT-1 方法练习

Bodie 2e 配套题库；C4-SHORT-1

CyberNow is opening an office in the U.S. CyberNow expects cash flows to be $500,000 for the first year, $530,000 for the second year, $560,000 in the third year. If CyberNow uses 12 percent as its discount rate, what is the present value of the cash flows? Assume cash flows are made at the end of the year.

C4-SHORT-2 方法练习

Bodie 2e 配套题库；C4-SHORT-2

GeorgiaSun Inc. has preferred stock that pays an annual dividend of $10.50. If the security has no maturity (an "infinite" life), what is its value to an investor who wishes to obtain an 8.5 percent rate of return?

C4-SHORT-3 方法练习

Bodie 2e 配套题库；C4-SHORT-3

Let us suppose you have a choice between investing in a bank savings account that pays 9% compounded annually (Bank Yearly) and one that pays 8.5% compounded daily (Bank Daily). (Assume this is based on 365 days). Using only effective annual rates, which bank would you prefer?

C4-SHORT-4 方法练习

Bodie 2e 配套题库；C4-SHORT-4

Steptoe's bank account has a floating interest rate on certain deposits. That is, every year the interest rate is adjusted. Four years ago Steptoe deposited $35,000 into the bank account, when interest rates were 6%. The following year the rate was 6.5%, last year the rate was 8% and this year the rate fell to 7.5%.

How much will be in his account at the end of the year? Assume annual compounding.

C4-SHORT-5 方法练习

Bodie 2e 配套题库；C4-SHORT-5

Calculate the net present value of the following cash flows: you invest $4,000 today and receive $400 one year from now, $900 two years from now and $2000 three years from now. Assume the interest rate is 9%.

C4-SHORT-6 方法练习

Bodie 2e 配套题库；C4-SHORT-6

The manufacturing manager of CyberNow Inc. estimates that she can save the company $20,000 cash per year over the next 5 years by implementing a recycling plan. What is the value of the savings today if the appropriate interest rate for the firm is 8%. Assume that cash flows occur at the end of the year.

C4-SHORT-7 方法练习

Bodie 2e 配套题库；C4-SHORT-7

Stroll Inc. has been offered a $2,000,000 jet under a 10 year loan agreement. The loan requires Stroll Inc. to make equal, annual, end-of-year payments that include both principal and interest on the outstanding balance. The interest rate on the loan is 11%. Calculate the amount of these annual payments.

C4-SHORT-8 方法练习

Bodie 2e 配套题库；C4-SHORT-8

Herb Flint decides to put $2,000 a year into an IRA fund over his 35 year working life and then retire. Assume the deposits are made at the end of the year. If the account earns 11% compounded annually, what will Herb have in the account when he retires?

C4-SHORT-9 方法练习

Bodie 2e 配套题库；C4-SHORT-9

Regarding retirement funds, there is some debate as to whether investors should invest at the beginning of the year rather than at the end of the year. If an investor invests $2,000 per year at 12% over a 35 year period, what is the difference between the two funds?

C4-SHORT-10 方法练习

Bodie 2e 配套题库；C4-SHORT-10

You have the chance to buy a bond for $900 that will make one payment of $1,100 six years from today. What is the internal rate of return in the bond's cash flows?

C4-SHORT-11 方法练习

⋆ Bodie 2e 配套题库；C4-SHORT-11；HW1-Q7

Consider the situation where you are trying to decide if you should invest in an Australian project or an American project. Both projects require an initial outlay of $20,000. The Australian project will pay you Aust $40,000 per year for 6 years, whereas the American one will generate $25,000 per year for 6 years. The Australian dollar interest rate is 6% per year and the American interest rate is 5% per year; the current dollar price of an Australian dollar is $0.65 per Australian dollar. Which project has the higher NPV?

C4-SHORT-12 方法练习

Bodie 2e 配套题库；C4-SHORT-12

If the exchange rate between the U.S. dollar and the Dutch Guilder is $0.49903 per Guilder, the dollar interest rate is 7% per year and the Dutch interest rate is 8% per year, what is the “break-even” value of the future dollar/Guilder exchange rate one year from now?

C4-SHORT-13 方法练习

Bodie 2e 配套题库；C4-SHORT-13

What is the real rate of interest if the nominal rate is 11.5% per year and the rate of inflation is 7% per year?

C4-SHORT-14 方法练习

Bodie 2e 配套题库；C4-SHORT-14

I have $200 today and am interested in finding out what its equivalent real future value will be in 40 years. What are the two ways I have available to me in computing the real future value?

C4-SHORT-15 方法练习

Bodie 2e 配套题库；C4-SHORT-15

The real rate of interest is 3.756%, the nominal rate of interest is 10.5% and the rate of inflation is 6.5%. What is the real future value of $2,000 in 40 years time? Show both methods.

C4-SHORT-16 方法练习

Bodie 2e 配套题库；C4-SHORT-16

As part of your new job at CyberInc. the company is providing you with a new Jeep. Your firm will lease this $34,000 Jeep for you. The terms of the lease are seven annual payments at an interest rate of 10%, which will fully amortize the cost of the car.

Assuming that all payments are made on time and no additional money is paid towards the lease in any year, what percent of the 5th payment will go towards repayment of principal?

C4-SHORT-17 方法练习

Bodie 2e 配套题库；C4-SHORT-17

You have decided to buy a car that costs $35,000. The dealer offers you a 5 year loan with monthly payments of $814 per month. What is the annual interest rate on the loan?

C4-SHORT-18 方法练习

Bodie 2e 配套题库；C4-SHORT-18

A subscription to the magazine “National Tattler” states that you can purchase a one year subscription for $45 today, which can be renewed after a year at this rate. Alternately, you can purchase a two year subscription for $80 today. If you wish to subscribe to the magazine for two years and your required rate of return is 9% per year, which subscription offer should you choose?

C4-LONG-1 综合计算

Bodie 2e 配套题库；C4-LONG-1

Use the source solution’s annual effective rate of 5% and end-of-year wages. The question paragraph omits this rate; without a rate the numerical present value is not unique. Heathcliff is currently 25 years old and expects to retire at age 65.

Suppose that Heathcliff takes a job immediately and can earn $35,000 for the remainder of his working life. What is the present value of his future earnings?

C4-LONG-1 Working space

C4-LONG-2 综合计算

Bodie 2e 配套题库；C4-LONG-2

In order to finance your dream home, you are considering borrowing $120,000. The annual percentage rate is 9% and payments are made annually over 5 years. Construct the loan-amortization schedule for the annual payments

C4-LONG-2 Working space

C4-LONG-3 综合计算

Bodie 2e 配套题库；C4-LONG-3

You are 60 years old and are considering whether it pays to buy an annuity from an insurance company. For a cost of $25,000, the insurance company will pay you $3,000 per year for the rest of your life. If you can earn 8% per year on your money in a bank account and expect to live until age 80, is it worth buying the annuity?

What implied interest rate is the insurance company paying you?

C4-LONG-3 Working space

C4-LONG-4 综合计算

Bodie 2e 配套题库；C4-LONG-4

Gemma Peel is 30 years today and she wishes to accumulate enough money over the next 35 years to provide for a 20 year retirement annuity of $100,000 at the beginning of each year, starting with her 65th birthday. Assume the rate of the return over the entire period will be 11%. What is the present value of this annuity?

C4-LONG-4 Working space

C4-LONG-5 综合计算

Bodie 2e 配套题库；C4-LONG-5

The exchange rate between the Canadian dollar and the U.S. dollar is currently $0.69190 per Canadian dollar, the dollar interest rate is 6% per year, and the Canadian dollar interest rate is 7% per year. You have $100,000 in a one-year account that allows you to choose between either currency and it pays the corresponding interest rate. What is the "break-even" value of the dollar/Canadian dollar exchange rate one year from now?

C4-LONG-5 Working space

C4-LONG-6 综合计算

Bodie 2e 配套题库；C4-LONG-6

Assume that you have just taken out a $300,000 30 year mortgage with monthly payments at an annual 8 percent rate. At the end of the 3rd year (after 36 payments), you begin paying an additional $100 each month towards the mortgage. That is, for months 37 onward you make the scheduled payment plus an extra $100 each month. To the nearest whole number, how many additional payments (payments in addition to the first 36) must you make before the mortgage is paid off?

C4-LONG-6 Working space

C4-LONG-7 综合计算

Bodie 2e 配套题库；C4-LONG-7

The company you work for has been experiencing financial difficulties and has just filed a reorganization plan. Three years ago, one of the firm's creditors lent the firm $80,000 on a ten year annual payment loan at a 15% interest rate.

Immediately after the firm made the third payment, as a result of the court settlement, the creditor agreed to decrease the current outstanding balance of the loan by 20%, to lower the interest rate to 10%, and to increase the remaining term of the loan to 15 years.

What will be the new annual payments on the firm's loan, assuming all these changes take place?

C4-LONG-7 Working space

C4-LONG-8 综合计算

⋆ Bodie 2e 配套题库；C4-LONG-8；HW1-Q8

Bank	APR	Compounding
A	10%	Annual
B	9.8%	Semiannual
C	9.6%	Quarterly
D	9.5%	Monthly
E	9.4%	Daily (365)

Anton has inherited $150,000 and decides to invest the money in a 20 year CD. He decides to invest the money with Bank E. If Anton had invested his money in the CD offering the best rate instead of Bank E, how much more money would he have had after 20 years?

C4-LONG-8 Working space

C4-LONG-9 综合计算

Bodie 2e 配套题库；C4-LONG-9

In order to care for their aged parents, Harold and Maude set aside today a capital sum to be liquidated over the next 10 years. The desired income stream for their parents is $40,000, beginning one year from today and rising 6 percent per year each year thereafter.

Harold and Maude estimate the investment earnings on the fund will be 9 percent per year. What amount must Harold and Maude set aside today to provide the desired income for their parents?

C4-LONG-9 Working space

F-HW02-01 贷款还款中的利息与本金

Loan Amortization

⋆ 2026 HW2；Part I 1

After each payment of an amortized loan, the outstanding balance is reduced by the amount of principal repaid.

Therefore, the portion of the payment that goes toward the payment of interest is _____ than the previous period's interest payment and the portion going toward repayment of principal is _____ than the previous period's.

A. greater; lower

B. lower; lower

C. greater; greater

D. lower; greater

第 5 章　家庭储蓄与投资

Household Saving and Investment

依据：Bodie 2e Ch5；Chapter 5 课程资料

工资 → 人力资本 → 终身预算 → 退休储蓄 → 税收、教育与住房

5.1　从工资到财富再到消费

Income becomes wealth through valuation

> **PRINCIPLE**　工资是流量，人力资本是现值，永久收入是可持续消费。

劳动收入（labor income）Y_t 是第 t 期工资流量；**金融财富**（financial wealth）W_0 是今天已持有资产减**债务**的存量；人力资本（human capital）H_0 是未来劳动收入的现值。永久收入（permanent income）在本题库中指与终身资源等现值、可维持的恒定实际消费流。工资每年 45,000、人力资本约 967,000 和每年消费约 36,000 是三种不同量，不能相互直接替换。

$$
\begin{aligned}
N_w &= \text{retirement age} - \text{current age},\\
N_r &= \text{death age} - \text{retirement age},\\
T &= N_w + N_r.
\end{aligned}
$$

$$
H_0 = \sum_{t=1}^{N_w} Y_t (1+r)^{-t}; \qquad H_0 = Y a_{N_w}(r) \quad \text{for constant wages.}
$$

固定实际工资（constant real wages）表示工作期内购买力不增长，不表示退休后仍收到工资。退休后若无**劳动收入**，**人力资本**为零，而金融财富可能为正。剩余寿命（remaining lifetime）决定消费期数，剩余工作期（remaining working life）决定工资期数，两者通常不同。

5.2 终身预算是资源守恒

The lifetime budget is a conservation equation

> **PRINCIPLE** 消费与遗产的现值，等于初始财富加未来收入现值。

A_t 是第 t 期末金融净财富，若工资和消费都在期末发生，期初财富先生息，再加收入减消费。**消费平滑**（consumption smoothing）要求各年实际消费相同。留下**遗产**（bequest）B 是终点保留财富，收到继承（inheritance）则是资源流入；今天收到的继承加在 W_0，未来遗产须先**贴现**。

$$A_t = (1+r)A_{t-1} + Y_t - C_t, \qquad A_0 = W_0, \qquad A_T = B.$$

将递推除以 $(1+r)^t$ 后从第 1 期加到第 T 期，中间财富项相互抵消，得到**跨期预算约束**（intertemporal budget constraint）。这一等式只表示资源与用途相等；可行性（feasibility）还可能受借款约束（borrowing constraint）影响，最优性（optimality）还需偏好和时间折现条件。

$$\sum_{t=1}^{T} \frac{C_t}{(1+r)^t} + \frac{B}{(1+r)^T} = W_0 + H_0.$$

恒定消费 C 的**现值**是 $C a_T(r)$。先从终身资源中减去**遗产**现值，再除以消费年金因子。固定工资、无初始财富和遗产时，代入 $H_0 = Y a_{N_w}(r)$，上下同有 $1/r$ 可约去。分子对应挣钱期，分母对应全部消费期，不能把**人力资本**除未贴现的寿命。

$$C = \frac{W_0 + H_0 - B(1+r)^{-T}}{a_T(r)}, \qquad C = Y\frac{1-(1+r)^{-N_w}}{1-(1+r)^{-T}} \quad (W_0 = B = 0).$$

零利率时 $a_n(0) = n$，才有 $C = (W_0 + YN_w - B)/T$。**替代率**（replacement rate）是年度退休收入或消费目标相对退休前年度收入的比例；本册**消费平滑**题用 $\rho = C/Y$。储蓄（saving）为收入未消费部分，提款或负储蓄（withdrawal / dissaving）可以由已有财富支持，不自动等于破产。

5.3 退休储蓄的连接日期

Retirement is a two-stage annuity problem

> **PRINCIPLE** 储蓄与提款先连接到退休日，普通或期初年金由日期决定。

退休规划（retirement planning）先求退休支出的退休日**现值**，再求工作期存款如何积累到这一金额。缴费（contribution / deposit）由本人或雇主支付；年金收款（annuity receipt）由积累账户或年金机构支付。期初或期末安排（begin / end mode）由真实付款日期决定，不能仅因题目说“从今天开始”就对所有公式额外乘一次利息。

$$W_0(1+r)^{N_w} + d\,s_{\overline{N_w}|}(r) = C_{ret}a_{\overline{N_r}|}(r)$$

上式假设工作年末存款、退休一年后首笔提款。退休当天首笔提款则右边多乘 $1+r$。先数实际日期，例如存 $t=0,\dots,30$ 共 31 笔，在第 30 年**终值**因子为 $s_{\overline{31}|}(r)$，第一笔仅增长 30 年。需要增长提款和终点**遗产**时，应把每笔提款及遗产一起折到退休连接日，再减已有财富累计值，最后除储蓄终值因子。

季度缴费而年度提款时，积累按季利率和季度次数，分配按年度有效利率；不能把四笔季度款直接当成年末合计款。每年内部金额变化、每年模式重复时，先把一年的十二笔现金换成同一个年初或年末等值，再对各年等值做年金。固定名义退休收入（fixed nominal retirement income）在首次金额按通胀调整后，之后金额保持不变；通胀指数化收入（inflation-indexed income）才会继续随物价增加。

社会保障（social security）在模型中使工作期每年减少可支配收入 q，退休期每年增加养老金 P。制度隐含收益率（implied return）用于把缴费与待遇配平，家庭可投资借贷利率用于估计该待遇对个人资源的价值；两者可以不同。**私人储蓄**（private saving）应为 $Y-q-C$，不能忘记已缴入制度的资金。

$$Ca_{\overline{T}|}(r) + B(1+r)^{-T} = W_0 + (Y-q)a_{\overline{N_w}|}(r) + Pa_{\overline{N_r}|}(r)(1+r)^{-N_w}.$$

5.4 税延与普通账户

Tax deferral changes the time at which tax is paid

> **PRINCIPLE** 税延改变纳税时点；两种账户须以同样的税前资源比较。

税延（tax deferral）推迟纳税，**免税**（tax exemption）免除相应税负，两者不同。题库传统 IRA（individual retirement account，个人退休账户）模型允许税前缴存，积累期不逐年征收益税，提款时对全额余额征税。普通储蓄账户（ordinary savings account）按题设先用已扣收入税的钱存入，利息再逐年纳税。比较须以同样的税前资源为基准，不能一边用税前金额、一边用税后金额。

$$FV_{deferred} = X(1+r)^n(1-\tau_R),$$
$$FV_{ordinary} = X(1-\tau_0)[1+r(1-\tau_g)]^n.$$

τ_0 是当前收入税率，τ_R 是提款税率，τ_g 是普通账户年度收益税率。普通账户一年只对利息 rA 征税，期末为 $A[1+r(1-\tau_g)]$，不能对**本金**也乘一次 $1-\tau_g$。税率相同时，**税延终值**可写成 $X(1-\tau)(1+r)^n$，即同样税后资源按税前率增长；该代数等值不表示账户实际一开始已缴税。

5.5 教育投资的增量收益

Education compares incremental lifetime earnings

> **PRINCIPLE** 教育投资比较新增成本与新增收入，放弃工资也是成本。

教育是**人力资本**投资。学费（tuition）和额外费用是**显性成本**（explicit cost），放弃工资（foregone earnings）是**隐性成本**（implicit cost）或机会成本（opportunity cost）。增量（incremental）只比较读书减不读书的差额：若生活费两边本来相同，不应全算教育新增成本；未来收益应为额外工资，而不是毕业后全部工资。

$$NPV_{edu} = -(Tuition + Y)a_{\overline{d}}(r) + \Delta Y\, a_{\overline{h}}(r)(1+r)^{-d}.$$

上式假设学习 d 年、每年末付成本，毕业一年后首笔额外工资共 h 年。令 NPV 为零，可把全部成本滚到毕业日，再除毕业时工资年金因子。收益**现值**与成本现值比较，或同一未来日期收益**终值**与成本终值比较，均成立；收益现值对成本终值的比较没有统一日期。

5.6 租买比较的完整成本

Housing combines purchase cost, tax shields and opportunity cost

> **PRINCIPLE** 租买比较同样住房服务的完整成本；抵扣只节省相应税款。

房价 P_0 是今天一次性支出，年度房产税（property tax）Tax_p 与维护费（maintenance）M 是持续支出；所得税率（income-tax rate）τ 决定可抵扣费用的**税盾**。可抵扣（deductible）只意味着少缴 τTax_p，不是免付房产税。若总费用已经包含房产税，先拆出维护费，或直接从总费用减税盾，避免把房产税重复加入。

$$h = M + Tax_p(1-\tau), \quad PV_{rent} = Rent/r_a, \quad PV_{buy} = P_0 + h/r_a.$$

这些永续公式假设相同住房服务、固定实际年末费用、长期持有和正的**税后实际利率** r_a。令成本**现值**相等并同乘 r_a，得到**临界租金**（break-even rent）和临界利率（break-even rate）。年度买房等值成本 $r_aP_0 + h$ 中，r_aP_0 是购房占款放弃的投资收益，不是另有一张付款账单；不能在已计一次完整房价后再把这项机会成本另加进同一个现值模型。

$$Rent^* = r_aP_0 + h, \qquad r_a^* = (Rent - h)/P_0.$$

题库的简化住房模型用 $r_a = r_b(1-\tau)$ 把税前实际率变成税后实际率；若给定已经是税后率，不再乘税率。若税实际按名义利息征收，则需先税后名义增长再扣通胀，不能无条件沿用简式。有限持有 n 年还应减去售房净收入**现值**；按揭（mortgage）模型还需统一首付（down payment）、还款与终点余额，不能同时重复计完整房价和**本金**偿还。

5.7 多目标储蓄只有一份资源

Multiple goals share one resource budget

> **PRINCIPLE** 多个目标共用一份预算，各种利率各自匹配对应现金流。

旅行支出、未来收到房产、已有存款与退休年金都应折到同一日期。投资账户利率用于本人积累现金，年金机构定价利率用于退休日购买退休给付，房产增值率用于推算售得金额，**通胀率**用于推算首次退休款购买力；四类利率各有用途。

第一笔退休款在第 31 年时，若通胀一直算到首笔收款就乘 31 次，而非 30 次。初始财富只能用一次，不能为每个目标重复抵扣。

5.8 英文概念与原理

English Definitions and Principles

1. Income becomes wealth through valuation

Labor income is a periodic earnings flow, initial financial wealth is a stock of existing assets less debts, and human capital is the present value of future labor income. In this test bank, permanent income is the sustainable constant real consumption stream with the same present value as lifetime resources.

Annual wages, the capital value of all future wages, and annual consumption are different quantities and cannot be substituted for one another.

Constant real wages mean unchanged wage purchasing power during employment, not continued wages after retirement. Human capital becomes zero when no labor earnings remain, while financial wealth may still be positive.

Remaining lifetime determines the number of consumption periods; remaining working life determines the number of wage payments. These generally differ.

2. The lifetime budget is a conservation equation

End-of-period financial wealth equals beginning wealth plus its return, then end-of-period earnings less consumption. Consumption smoothing specifies equal real consumption across periods. A bequest is wealth retained at the terminal date; an inheritance received is an inflow.

An inheritance received today increases initial wealth, whereas a terminal bequest must be discounted before it reduces resources available for current valuation.

Divide the wealth recursion by the corresponding discount factor and sum across periods. Intermediate wealth terms cancel, producing the intertemporal budget constraint. The identity equates resources and uses.

Borrowing constraints may impose further requirements for feasibility, and optimality additionally requires preferences and time-discount conditions.

A constant consumption stream has value C times the lifetime annuity factor. Deduct the bequest's present value from resources before dividing by that factor. With constant wages and no initial wealth or bequest, substitute the wage-annuity value; the common rate denominator cancels.

The numerator represents earning periods and the denominator all consumption periods. Dividing human capital by the undiscounted number of years is generally incorrect.

At a zero rate, annuity factors reduce to period counts and consumption becomes the average of net lifetime resources. A replacement rate compares annual retirement income or consumption with annual pre-retirement income; smoothing problems here use C divided by Y. Saving is unconsumed income.

Withdrawals or dissaving can be financed from existing wealth and do not by themselves mean insolvency.

3. Retirement is a two-stage annuity problem

Retirement planning first values withdrawals at retirement, then determines how working-period contributions accumulate to that target. Contributions come from the household or employer; annuity receipts come from the accumulated account or annuity provider. Beginning or ending mode must follow actual dates.

A phrase such as starting today does not justify an extra growth factor at every possible valuation date.

The displayed equation assumes end-of-year working deposits and the first retirement withdrawal one year after retirement. A withdrawal on the retirement date multiplies the right side by one plus r.

Count the dates explicitly: deposits from zero through thirty comprise thirty-one payments, but the first grows only thirty years by time thirty. Growing withdrawals and a bequest are valued together at retirement before accumulated initial wealth is deducted and the saving payment is solved.

Quarterly contributions require a quarterly accumulation rate and count, while annual withdrawals require an effective annual rate. Four quarterly payments cannot simply be combined at year-end. For a repeating within-year pattern, first obtain one year’s equivalent beginning or ending amount, then value those annual equivalents.

A fixed nominal retirement income remains numerically unchanged after its initial level is set; only an inflation-indexed income continues to rise with prices.

Social security reduces disposable working income by contributions q and adds retirement pension payments P. The program's implied return balances contributions and benefits, while the household's investment and borrowing rate values those benefits for its own budget. These rates may differ.

Private saving subtracts both the contribution and consumption from wages.

4. Tax deferral changes the time at which tax is paid

Tax deferral postpones taxation; exemption removes a specified tax. The traditional IRA model in the test bank allows deductible contributions, no annual tax on accumulated returns, and taxation of the full withdrawal. The ordinary account begins with income-tax-paid funds and taxes its interest annually.

A fair comparison uses the same pretax resources, rather than comparing pretax funds on one side with already-taxed funds on the other.

The three tax rates refer to current income, retirement withdrawal, and ordinary annual investment gains. An ordinary account taxes interest, not the principal again each year. With an unchanged tax rate, the deferred-account terminal amount equals after-tax initial resources compounded at the pretax return.

This algebraic equivalence does not mean the deferred account actually paid the tax at the beginning.

5. Education compares incremental lifetime earnings

Education invests in human capital. Tuition and additional expenses are explicit costs; earnings forgone are implicit or opportunity costs. Incremental analysis compares education with the no-education alternative.

Living expenses common to both alternatives are not wholly additional education costs, and the benefit is the wage increase rather than the entire post-graduation wage.

The equation assumes d years of end-of-year costs and h annual wage increments starting one year after graduation. For the break-even increase, accumulate costs to graduation and divide by the wage-annuity factor at graduation.

Present benefits can be compared with present costs, or future benefits and costs can be compared at one common future date. Mixing present benefits with future costs does not give a valid decision rule.

6. Housing combines purchase cost, tax shields and opportunity cost

The house price is a one-time current payment; property taxes and maintenance are ongoing costs. The income-tax rate determines the shield on deductible property taxes. A deduction saves the tax rate times the expense rather than eliminating the expense.

When total holding costs already include property taxes, separate maintenance or subtract the shield from that total to avoid counting the tax twice.

These perpetuity formulas assume equivalent housing services, fixed real end-of-year expenses, indefinite holding, and a positive after-tax real rate. Equating present costs and multiplying by the rate gives break-even rent and break-even interest.

In the annual equivalent ownership cost, interest on the tied-up purchase capital is an opportunity cost rather than another cash invoice. It must not be added again to a present-value model that already includes the full purchase price.

The test-bank housing simplification converts a pretax real rate by multiplying its after-tax factor; an already after-tax rate must not be taxed twice. If taxes are levied on nominal interest, the exact after-tax real rate instead requires both nominal taxation and inflation adjustment.

A finite holding period deducts the present value of net resale proceeds. A mortgage formulation must consistently include the down payment, loan payments, and terminal balance without duplicating the full house price and principal repayments.

7. Multiple goals share one resource budget

Travel expenses, inherited property, current savings, and retirement annuities belong in a single resource budget.

The investment-account rate values accumulation, the annuity-provider rate prices retirement benefits at purchase, property appreciation determines future sale proceeds, and inflation sets the first retirement payment's purchasing power. These rates serve different purposes.

If inflation continues until a first payment in year thirty-one, it compounds thirty-one times. Existing wealth cannot be deducted separately against every goal as if it were available repeatedly.

C5-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-1

Getting a professional degree can be evaluated as ____.

(a) social security decision

(b) an investment in human capital

(c) an investment in a consumer durable

(d) tax exempt decision

C5-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-2

Suppose you will face a tax rate of 20% before and after retirement. The interest rate is 8%. You are 30 years before your retirement date and invest $10,000 to a tax deferred retirement plan. If you choose to withdraw the total accumulated amount at retirement, what will you be left with after paying taxes?

(a) $51,445

(b) $64,000

(c) $80,501

(d) $100,627

C5-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-3

Suppose you will face a tax rate of 20% before and after retirement. The interest rate is 8%. You are 30 years before your retirement date and have $10,000 to invest. If you invest this in an ordinary savings plan instead of a tax deferred retirement plan, what amount will you have accumulated at retirement?

(a) $51,445

(b) $64,000

(c) $80,501

(d) $100,627

C5-MC-4 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-4

When your tax rate remains unchanged, the benefit of tax deferral can be summarized in the rule, "deferral earns you ____."

(a) the after-tax rate of return before tax

(b) the pretax rate of return after tax

(c) the after-tax rate of return after tax

(d) the pretax rate of return before tax

C5-MC-5 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-5

From an economic perspective, professional training should be undertaken if the ____ exceeds the ____.

(a) future value of the benefit; present value of the costs

(b) present value of the benefits; future value of the costs

(c) future value of the benefits; future value of the costs

(d) present value of the benefits; future value of the costs

C5-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-6

Suppose you will face a tax rate of 30% before and after retirement. The interest rate is 6%. You are 35 years before your retirement date and $2,000 to a tax deferred retirement plan. If you choose to withdraw the total accumulated amount at retirement, what will you be left with after paying taxes?

(a) $7,532

(b) $10,760

(c) $12,298

(d) $15,372

C5-MC-7 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-7

Kecia is currently thirty years old and she plans to retire at age sixty. She is expected to live to age eighty-five. Her labor income is $45,000 per year and she intends to maintain a constant level of real consumption spending over the next fifty-five years. Assuming a real interest rate of 4% per year, no taxes, and no growth in real labor income, what is the value of Kecia's human capital?

(a) $31,797

(b) $35,196

(c) $778,141

(d) $994,888

C5-MC-8 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-8

Kecia is currently thirty years old and she plans to retire at age sixty. She is expected to live to age eighty-five. Her labor income is $45,000 per year and she intends to maintain a constant level of real consumption spending over the next fifty-five years. Assuming a real interest rate of 4% per year, no taxes, and no growth in real labor income, what is the value of Kecia's permanent income?

(a) $31,797

(b) $35,196

(c) $778,141

(d) $994,888

C5-MC-9 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-9

Oscar is currently thirty-five year old, plans to retire at age sixty-five, and to live to age eighty-five. His labor income is $40,000 per year, and he intends to maintain a constant level of real consumption spending over the next fifty years. Assuming a real interest rate of 4% per year, no taxes, and no growth in real labor income, what is the value of Oscar's human capital?

(a) $884,344

(b) $691,681

(c) $39,999

(d) $32,198

C5-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-10

Oscar is currently thirty-five year old, plans to retire at age sixty-five, and to live to age eighty-five. His labor income is $40,000 per year, and he intends to maintain a constant level of real consumption spending over the next fifty years. Assuming a real interest rate of 4% per year, no taxes, and no growth in real labor income, what is the value of Oscar's permanent income?

(a) $884,344

(b) $691,681

(c) $39,999

(d) $32,198

C5-MC-11 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-11

You are currently renting a house for $12,000 per year, and you also have an option to buy it for $240,000. Maintenance and property taxes are estimated to be $4,320, and these costs are included in your rent. Property taxes ($2,880 of the $4,320) are deductible for income tax purposes. Your tax rate is 35%. You wish to provide yourself with housing at the lowest present value of cost. If the real after-tax rate is 2.52%, should you rent or buy?

(a) rent the house; the PV cost of renting is $476,190

(b) rent the house; the PV cost of renting is $309,524

(c) buy the house; the PV cost of owning is $442,198

(d) buy the house; the PV cost of owning is $371,429

C5-MC-12 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-12

You are currently renting a house for $12,000 per year and you also have an option to buy it for $240,000. Maintenance and property taxes are estimated to be $4,320, and these costs are included in your rent. Property taxes ($2,880 of the $4,320) are deductible for income tax purposes. Your tax rate is 35%. You wish to provide yourself with housing at the lowest present value of cost. The real after-tax rate is 2.52%. What is the break-even rent?

(a) $6,048

(b) $9,360

(c) $10,128

(d) $12,302

C5-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-13

As one gets older, the ____ declines, so ____ falls steadily until it reaches zero at age 65.

(a) future value of remaining labor income; human capital

(b) future value of remaining labor income; initial wealth

(c) present value of remaining labor income; human capital

(d) present value of initial wealth; optimization

C5-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-14

Any lifetime consumption spending plan that satisfies your budget constraint is:

(a) an optimal model

(b) feasible plan

(c) model benefit

(d) target replacement

C5-MC-15 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-15

There is an advantage to tax deferred retirement savings plans for those ____ when the money is withdrawn.

(a) who will be in a lower tax bracket

(b) who will be in the same tax bracket

(c) both (a) and (b)

(d) neither (a) nor (b)

C5-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-16

In the United States, individual retirement accounts (IRAs) are called ____ rather than ____ because any amounts withdrawn from the plan are taxed at the time of withdrawal.

(a) tax advantaged; tax deferred

(b) tax deferred; tax exempt

(c) tax advantaged; tax loopholes

(d) tax exempt; tax deferred

C5-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-17

The present value of one's future labor income is called ____ and the constant level of consumption spending that has a present value equal to one's human capital is called ____.

(a) human income; taxable income

(b) human capital; permanent income

(c) permanent capital; taxable income

(d) permanent income; human capital

C5-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-18

The ____ the interest rate, the ____ the value of human capital, but the higher the level of permanent income.

(a) lower; lower

(b) higher; lower

(c) higher; higher

(d) lower; higher

C5-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-19

The ____ states that the present value of one's lifetime consumption spending and bequests equals the present value of one's initial wealth and future labor income.

(a) consumption budget constraint

(b) spending constraint

(c) intertemporal budget constraint

(d) income and spending constraint

C5-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-20

According to the text, many experts recommend that in making a savings plan one should aim for a replacement rate of ____ of pre-retirement income.

(a) 100%

(b) 25%

(c) 50%

(d) 75%

C5-MC-21 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-21

Economic costs that are said to be explicit costs include items such as ____.

(a) tuition

(b) foregone rent

(c) foregone earnings

(d) all of the above

C5-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-22

Economic costs that are said to be implicit costs include items such as ____.

(a) tuition

(b) administrative fees while undertaking a professional degree

(c) foregone earnings

(d) all of the above

C5-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-23

In making lifetime saving/consumption decisions it is considered simpler to do the analysis ____.

(a) in nominal terms

(b) in inflationary terms

(c) in perpetual terms

(d) in real terms

C5-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-24

In terms of a lifetime saving/consumption decision such as buying or renting an apartment or a consumer durable, the alternative you should choose is ____.

(a) the one with the lower present value of benefits

(b) the one with the lower present value of costs

(c) the one with the higher present value of costs

(d) the one with the lower present value of benefits and the higher present costs

C5-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-25

Among the approaches you can use for saving for your retirement is/are ____.

(a) aiming to maintain the same level of consumption spending before and after retirement

(b) aiming for a target replacement rate of income

(c) bypassing graduate school and continuing to consume at the same level

(d) (a) and (b)

C5-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-26

In the equation known as the intertemporal budget constraint, ____.

(a) the present value of lifetime consumption spending equals the present value of bequests

(b) the present value of lifetime consumption spending and bequests equals the present value of lifetime resources

(c) the present value of lifetime consumption spending equals the future value of labor income

(d) the future value of lifetime consumption spending equals the present value of labor income

C5-MC-27 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-27

Salman is currently twenty-five years old and plans to live to age eighty. His labor income is $75,000 per year and he plans to maintain a constant level of real consumption spending over the next fifty-five years. Salman plans to retire at age 60. Assume the real interest rate is 5% per year and there are no taxes and no growth in real labor income. What is the value of Salman's permanent income?

(a) $75,000

(b) $65,906

(c) $85,348

(d) $1,228,064

C5-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C5-MC-28

You are currently renting a house for $25,800 a year and you have an option to buy it for $350,000. Maintenance and property taxes are $6,150 per year and these costs are included in your rent. Property taxes ($4,150 of the $6,150) are deductible for income tax purposes. Your tax rate is 35%. The real after-tax rate is 3.5%. What is the break-even rent?

(a) $16,770.00

(b) $16,947.50

(c) $21,102.46

(d) $24,927.54

C5-SHORT-1 方法练习

Bodie 2e 配套题库；C5-SHORT-1

You are currently renting a house for $17,000 a year and you also have an option to buy it for $300,000. Maintenance and property taxes are $5,040 per year and these costs are included in your rent. Property taxes ($3,360 of the $5,040) are deductible for income tax purposes. Your tax rate is 40%. You wish to provide yourself with housing at the lowest present value of cost. The real after-tax rate is 3.1% per year. Should you rent or buy?

What is the break-even rent?

C5-SHORT-2 方法练习

Bodie 2e 配套题库；C5-SHORT-2

You are currently renting a house for $16,000 a year and you also have an option to buy it for $250,000. Property taxes and maintenance care is $5,000 per year, and these costs are included in your rent. Property taxes ($3,200 of the $5,000) are deductible for income tax purposes. Your tax rate is 40%. You wish to provide yourself with housing at the lowest present value of cost. The real before-tax discount rate is 3.5% per year.

Should you rent or buy? What is the break-even rate?

C5-SHORT-3 方法练习

Bodie 2e 配套题库；C5-SHORT-3

Kieran is currently twenty-five years old, plans to retire at age sixty, and to live to age eighty. His labor income is $45,000 per year, and he intends to maintain a constant level of real consumption spending over the next fifty-five years.

Assuming a real interest rate of 3%, no taxes, and no growth in real labor income, what is the value of Kieran's human capital? What is the value of Kieran's permanent income?

C5-SHORT-4 方法练习

Bodie 2e 配套题库；C5-SHORT-4

Mariana is currently thirty years old, plans to retire at age seventy and to live to age ninety. Her labor income is $60,000 per year, and she intends to maintain a constant level of real consumption spending over the next sixty years.

Assuming a real interest rate of 4% per year, no taxes and no growth in real labor income, what is the value of Mariana's human capital? What is the value of Mariana's permanent income?

C5-SHORT-5 方法练习

Bodie 2e 配套题库；C5-SHORT-5

Your employer, Novocastrian Films, has agreed to make 60 quarterly payments of $1,000 each into a trust account to fund your early retirement. The first payment will be made 3 months from now.

At the end of 15 years (60 payments), you will be paid 15 equal annual payments, with the first receipt to be made at the beginning of Year 16 (or the end of Year 15). The funds will be invested at a nominal rate of 10.0%, quarterly compounding, during both the accumulation and the distribution periods.

How large will each of your 15 receipts be?

C5-SHORT-6 方法练习

Bodie 2e 配套题库；C5-SHORT-6

Mr. Palin has received a job offer from a large investment bank as an assistant to the vice president and Mr. Palin's base salary will be $90,000. In addition, he will receive his first annual salary payment one year from the day he begins work. He will also get an immediate $45,000 bonus for joining the company and his salary will grow at 8 percent each year. Mr. Palin is expected to work for 20 years.

What is the present value of the offer if the appropriate discount rate is 11 percent?

C5-SHORT-7 方法练习

Bodie 2e 配套题库；C5-SHORT-7

Natalia will face a tax rate of 25% before and after retirement. The interest rate is 9%. She is 35 years from her retirement date and invests $5,000 to a tax deferred retirement plan. If she chooses to withdraw the total accumulated amount at retirement, what will she be left with after paying taxes?

C5-SHORT-8 方法练习

Bodie 2e 配套题库；C5-SHORT-8

Damian is currently twenty-five years old and plans to live to age eighty. His labor income is $80,000 per year, and he plans to maintain a constant level of real consumption spending over the next fifty-five years. Damian plans to retire at age 60.

Assume the real interest rate is 5% per year and there are no taxes and no growth in real labor income. What is the value of Damian's human capital? What is the value of Damian's permanent income?

C5-SHORT-9 方法练习

Bodie 2e 配套题库；C5-SHORT-9

You are currently renting a house for $25,800 a year and you have an option to buy it for $350,000. Maintenance and property taxes are $6,150 per year, and these costs are included in your rent. Property taxes ($4,150 of the $6,150) are deductible for tax purposes. Your tax rate is 35%. The real after tax rate is 3.5%. What is the NPV of the investment in the house?

C5-SHORT-10 方法练习

Bodie 2e 配套题库；C5-SHORT-10

Carson will face a tax rate of 30% before and after retirement. The interest rate is 6%. He is 32 years from his retirement date and invests $3,000 to a tax deferred retirement plan. If he chooses to withdraw the total accumulated amount at retirement, what will he be left with after paying taxes?

Show how to find the answer using the rule, “Deferral earns you the pretax rate of return after tax.”

C5-LONG-1 综合计算

Bodie 2e 配套题库；C5-LONG-1

Tamara is currently twenty-eight years old, plans to retire at age seventy and to live to age ninety. Her labor income is $50,000 per year, and she intends to maintain a constant level of real consumption spending over the next sixty-two years. Assume no taxes, no growth in real labor income and a real interest rate of 4% per year.

What is the value of Tamara's human capital? What is the value of Tamara's permanent income?

C5-LONG-1 Working space

C5-LONG-2 综合计算

Bodie 2e 配套题库；C5-LONG-2

You have just turned twenty-eight years of age and feel it is necessary to upgrade your qualifications. After some consideration, you feel that undertaking full-time study for an MBA degree is one alternative. For the two years of full-time study, tuition and living expenses will be $25,000 per year. In addition, you will have to give up your current job with a salary of $35,000 per year.

Assume all cash flows occur at the end of the year. Assume a real interest rate of 4% per year, ignoring taxes. Also assume that the salary increase is at a constant real amount that starts after you complete your degree (at the end of the year following graduation) and lasts until retirement at age sixty-five.

In order to justify the investment, by how much does your salary have to increase as a result of getting the MBA degree?

C5-LONG-2 Working space

C5-LONG-3 综合计算

Bodie 2e 配套题库；C5-LONG-3

At the age of thirty Terry was earning $30,000 and decided to undertake an MBA to increase his earning potential. Two years later Terry has his degree and has achieved a constant real increase of $5,898 in his annual salary that will last until he retires at age sixty. If Terry lives to the age of ninety, what will be the value of his human capital and permanent income? Assume a real interest rate of 2.52% per year, no taxes, and no growth in real labor income.

C5-LONG-3 Working space

C5-LONG-4 综合计算

Bodie 2e 配套题库；C5-LONG-4

Juliet currently rents an apartment but has the option to buy it for $185,000. Property taxes are $2,000 per year and are deductible for income tax purposes. Annual maintenance costs are $1,800 per year, but are not tax deductible. Juliet expects that the above taxes will increase at the rate of inflation.

Her income tax rate is 35%, and she can earn a before-tax real interest rate of 5% per year. If Juliet buys the apartment she plans to keep it forever. What is the "break-even" annual rent such that Juliet would buy the apartment if the rent exceeded this amount?

C5-LONG-4 Working space

C5-LONG-5 综合计算

Bodie 2e 配套题库；C5-LONG-5

Anton’s retirement goal is to set aside an amount of money each year into a savings account until he retires so that he can withdraw $80,000 each year during his retirement. He expects to retire in thirty years and expects to live for twenty years following his retirement.

Anton expects to be able to earn 9 percent per year on his account balance. Calculate the deposit Anton must make for Plan 1 and the amount of the deposit Anton must make for Plan 2. Plan 1: Anton’s first deposit will be one year from today and his last deposit will be twenty-nine years from today.

He intends to make his first withdrawal thirty years from today. Plan 2: Anton’s first deposit will be today and his last deposit will be thirty years from today. He intends to make his first withdrawal thirty one years from today.

C5-LONG-5 Working space

C5-LONG-6 综合计算

Bodie 2e 配套题库；C5-LONG-6

Your 68 year old mother plans to retire in 2 years, and she expects to live independently for 3 years. She wants a retirement income that has, in the first year, the same purchasing power as $60,000 has today. However, her retirement income will be of a fixed amount, so her real income will decline over time. Her retirement income will start the day she retires (2 years from today), and she will receive a total of 3 retirement payments. Inflation is expected to be constant at 6%. Your mother has $100,000 in savings now, and she can earn 9% on savings now and in the future.

How much must she save each year, starting today, to meet her retirement goals?

C5-LONG-6 Working space

C5-LONG-7 综合计算

Bodie 2e 配套题库；C5-LONG-7

A relative of yours has just turned 45 years old and plans on retiring in 15 years on her 60th birthday. She is saving money today for her retirement and is establishing a retirement account with your office. She would like to withdraw money from her retirement account on her birthday each year until she dies.

She would ideally like to withdraw $60,000 on her 60th birthday, and increase her withdrawals 10% a year through her 69th birthday (i.e., she would like to withdraw $141,476.86 on her 69th birthday). She plans to die on her 70th birthday, at which time she would like to leave $400,000 to her descendants. Your relative currently has $100,000. You estimate that the money in the retirement account will earn 11% a year over the next 25 years.

Calculate how much your relative should deposit each year (at the end of each year).

C5-LONG-7 Working space

C5-LONG-8 综合计算

Bodie 2e 配套题库；C5-LONG-8

Consider the following retirement plan. Today is January 1 and your employer will make a $100 contribution to your retirement plan at the end of January and this amount will increase by $100 each month through December 31. Thus in February you get $200 and then up to a $1,200 contribution on December 31. Thus at the end of each January, you will always receive $100 and the end of each December you will always receive $1,200.

The employer will continue this contribution pattern for the next 25 years. You expect to receive a 12% quoted yield, compounded monthly, on your investments. How much money will be in your account when you retire?

C5-LONG-8 Working space

C5-LONG-9 综合计算

Bodie 2e 配套题库；C5-LONG-9

Monthly saving plan

Assume that you are planning for your financial future and you would like to fund all of your financial needs by making monthly payments into an account that will pay 10 percent, compounded monthly.

You plan to make these monthly payments for a total of 30 years with the first payment to be made one month from today. How much should your monthly payments be? You need to use the following information:

Travel in year 3

You have promised your partner that you will take a trip to Europe 3 years from today. You estimate that the trip will cost $10,000.

Retirement income

You will retire in 30 years. If you could retire today you estimate that you would need sufficient funds to purchase a 15 year fixed payment annuity that would pay $50,000 per year with the first payment to be received one year after you retire.

You assume that the price you will have to pay for the annuity will be based on an interest rate of 8.5 percent.

Due to inflation, you estimate that the amount of the required annual annuity payment will increase by 4 percent per year until the date you receive the first payment, but the annuity payment will remain fixed once you purchase the annuity.

Real-estate transfer in year 5

Your parents have promised to give you a piece of real estate in 5 years and today the real estate is worth $12,000. You expect that the real estate will increase in value by 9 percent per year. You plan to sell the real estate as soon as you receive it and to place the proceeds in your account.

Initial savings

You have already saved $15,000, which you will place in your account today.

C5-LONG-9 Working space

SYN-1 跨期综合问题

⋆ 原重点标记版综合题；SYN-1

Suppose you are 25 years old and expect to retire at 65. You earn $35,000 every year (assume you receive it at the end of each year) in real terms, net of taxes, and expect to live for 15 more years after retirement. Suppose the real rate of interest on borrowing and lending is 4%. Take each sub-question independently.

(a) What is the optimal consumption level for this level of real income and real interest rate?

(b) For this example, what is the target replacement rate implied by the consumption level under consumption smoothing?

(c) What is the value of your human capital at 25 years old?

(d) Suppose you want to keep the same level of consumption every year until you die. If you want to die leaving $100,000 to your favorite niece, how much should your annual consumption be?

(e) Suppose you receive an inheritance of $100,000 now. How would your consumption and savings change under consumption smoothing?

(f) Suppose you have to pay social security taxes of $2,000 per year, and the implied real interest rate paid to you by the social security agency is 5%.

Under consumption smoothing, what is your optimal consumption level, and the optimal savings amount if you knew at age 25 that the implied real interest rate paid to you by the social security agency is 5%?

SYN-1 Working space

F-HW02-02 年龄与人力资本

Human Capital

⋆ 2026 HW2；Part I 2

Assume that real labor income stays constant.

As one gets older, the _____ declines, so _____ falls steadily until it reaches zero when one retires.

A. future value of remaining labor income; human capital

B. future value of remaining labor income; initial wealth

C. present value of remaining labor income; human capital

D. present value of initial wealth; optimization

F-HW02-06 租房与买房

Renting versus Buying a Home

⋆ 2026 HW2；Part II 1

You are currently renting a house for $16,000 a year and you also have an option to buy it for $250,000. Property taxes and maintenance care is $5,000 per year, and these costs are included in your rent. Property taxes ($3,200 of the $5,000) are deductible for income tax purposes. Your tax rate is 40%. You wish to provide yourself with housing at the lowest present value of cost.

The real before-tax discount rate is 3.5% per year.

a. Should you rent or buy?

b. What is the break-even rate?

F-HW02-06 Working space

F-HW02-08 人力资本与永久收入

Kieran: Human Capital and Permanent Income

⋆ 2026 HW2；Part II 3

Kieran is currently twenty-five years old, plans to retire at age sixty, and to live to age eighty. His labor income is $45,000 per year, and he intends to maintain a constant level of real consumption spending over the next fifty-five years.

Assuming a real interest rate of 3%, no taxes, and no growth in real labor income.

a. What is the value of Kieran's human capital?

b. What is the value of Kieran's permanent income?

F-HW02-08 Working space

第 6 章　投资项目分析

The Analysis of Investment Projects

依据：Bodie 2e Ch6；Chapter 6 课程资料

增量现金流 → 利润转现金 → 营运资本 → 净现值 → 盈亏平衡与项目比较

6.1　项目价值来自增量现金

Value comes from incremental project cash

> **PRINCIPLE**　项目价值取决于新增现金流，会计利润不能直接代替。

资本预算（capital budgeting）以投资项目为单位，比较做项目与不做项目的**增量现金流**（incremental cash flow）。新产品（new-product project）扩展业务，成本降低项目（cost-reduction project）减少现有支出，资产替换（replacement project）更新设备。沉没成本（sunk cost）已经发生、无法由当前选择改变，应排除；机会成本（opportunity cost）是使用已有资源放弃的可得收益，应计入；新产品挤掉原产品利润的蚕食效应（cannibalization）也是增量影响。

销售收入（revenue / sales）为销量 Q 乘单位价格 p；**现金变动成本**（variable cash cost）为 vQ；**现金固定成本**（fixed cash cost）FC 在相关产量范围内不随 Q 变化。单位边际贡献（unit contribution margin）$p - v$ 先覆盖固定成本，其余才形成经营盈余。首年价格已给为 p_1 时，第 t 年为 $p_1(1+g)^{t-1}$；今天价格若尚需通胀到首年，指数才可能从 t 开始。

6.2　EBIT、税后利润与经营现金

Accounting profit must be converted to cash

> **PRINCIPLE**　折旧不付现金但能节税；经营现金流加回折旧、保留税盾。

设备购置形成资本支出（capital expenditure / CapEx）；必要安装费按题设资本化（capitalization）进入成本基础。**折旧**（depreciation）将成本分摊到会计或税务期间，不是在每期再买一次设备。直线折旧（straight-line depreciation）为可折旧基础减规定残值后除折旧年数；**账面价值**（book value / BV）为未折旧账

面余额，残值或出售价值（salvage value / SV）是终期市场回收，两者可不同。完全折旧不代表售价必为零。

$$D = \frac{Cost - \text{depreciation-basis residual}}{n}, \qquad BV_t = Cost - \sum_{k=1}^{t} D_k.$$

EBIT（earnings before interest and taxes，息税前利润）是收入减现金经营成本和**折旧**，尚未扣融资利息与所得税。EAT（earnings after tax，**税后利润**）或 NI（net income，净利润）在本章无单独融资利息的简化项目模型中为 $EBIT(1-\tau)$。**经营现金流**（operating cash flow / OCF）来自经营实际收付，需把利润中扣过的非现金折旧加回。题给已经是税后利润时，不能再乘一次 $1-\tau$。

$$\begin{aligned} EBIT &= (p-v)Q - FC - D, \\ OCF &= EBIT(1-\tau) + D \\ &= [(p-v)Q - FC](1-\tau) + \tau D. \end{aligned}$$

折旧税盾（depreciation tax shield）τD 是允许**折旧**扣除而少缴的税，不是折旧本身变成现金。例如收入 1,000、现金成本 600、折旧 100、税率 20%，EBIT 为 300，税 60，**税后利润** 240，OCF 为 340。若没有折旧扣除，税应为 80，因此折旧节税 20。亏损时是否能立即用税盾取决于税务条件，本册闭式公式假设税盾可当期使用。

6.3 营运资本占用、追加与回收

Working capital uses cash and can release it

> **PRINCIPLE** 营运资本增加占款，减少释放现金；终期回收须明确。

净营运资本（net working capital / NWC）反映经营占用的短期净资金。报表定义为流动资产减流动负债；无杠杆项目更常用经营流动资产减无息经营应付款。库存、应收款和必要经营现金占用资金，应付款提供部分融资。余额 NWC_t 与当期增加额 $\Delta NWC_t = NWC_t - NWC_{t-1}$ 不同，**现金流**只扣新增占用，不每年重复扣全部余额。

$$FCF_t = EBIT_t(1-\tau) + D_t - CapEx_t - \Delta NWC_t.$$

自由**现金流**（free cash flow / FCF）在此是 OCF 扣除设备和营运资本再投入后可供资本提供者的无杠杆现金。NWC 不**折旧**。终止时出售库存、收回应收并结清应付，才能释放相应余额；题设全部回收时加回累计余额，不回收时不可擅加。末年仍有经营 OCF，不能用回收项替掉最后一期经营回款。

设备出售损益按同税率即时处理时，税后回收为 $SV-\tau(SV-BV)$。NWC 回收一般是原投入释放，不是另一次销售利润，不重复征同一种销售利润税；若存在折价或坏账，应按实际回收及其税务调整。

6.4 资本成本与净现值

The discount rate prices comparable risk

> **PRINCIPLE** 资本成本补偿时间与风险；正 NPV 是补偿后的财富增量。

资本成本（cost of capital）是投资者对相应风险**现金流**要求的回报，亦为**机会成本**。加权平均资本成本（weighted average cost of capital / WACC）使用**市场价值**权重；普通股、优先股、债务成本为 k_e,k_p,k_d，权重 w_e,w_p,w_d 合计 1。利息可抵税时债务项乘 $1-\tau$；用 WACC 贴现无杠杆流量时，通常不再把融资利息作为经营费用另扣。

$$WACC=w_ek_e+w_pk_p+w_dk_d(1-\tau),\qquad w_j=V_j/\sum_k V_k.$$

系统性风险（systematic / market risk）是分散投资后仍与市场共同变动的风险，非系统性风险（unsystematic / firm-specific risk）可以分散。体系性风险（systemic risk）涉及**金融体系**功能，是另一概念。资本成本应反映项目**现金流**风险，只有项目是原企业资产的相容“缩小复制”时，现有企业平均成本才适用。

$$NPV(r)=-I_0+\sum_{t=1}^{n}\frac{CF_t}{(1+r)^t},\qquad NPV(IRR)=0.$$

常规**现金流**（conventional cash flows）先净流出、随后非负流入，使 NPV 随利率增加而降低且有唯一 IRR。提高利率使每笔未来正回款**现值**变小，初始成本不变，这是不用微积分也能理解的原理。求 IRR 可代入选项或二分正负 NPV 利率。改变资本成本不改变 IRR，缺逐年数据时仍可用 IRR 与新门槛率比较常规**独立项目**。

6.5 盈亏平衡先说明什么等于零

Break-even conditions identify a precise target

> **PRINCIPLE** 会计不亏不等于投资合算；财务盈亏平衡须令 NPV 为零。

会计盈亏平衡（accounting break-even）令会计经营利润为零；**现金盈亏平衡**（cash break-even）令 OCF 为零；**财务盈亏平衡**（financial / NPV break-even）令 NPV 为零。会计不亏尚未补偿资本机会成本，不能代替财务标准。给定所需 OCF 时，先扣税盾、除税后比例、再覆盖现金固定成本，最后除单位边际贡献。

$$
\begin{aligned}
Q_{accounting} &= (FC + D)/(p - v), \\
OCF^{*} &= \frac{I_0 - TV(1+r)^{-n}}{a_n(r)}, \\
Q^{*} &= \frac{FC + (OCF^{*} - \tau D)/(1-\tau)}{p - v}.
\end{aligned}
$$

这些式子假设固定投入、等额年度 OCF、给定终期回收 TV。若 NWC 随销售额变，必须联立完整 $NPV(Q) = 0$，固定原预测销量对应的 NWC 会给另一条件下的解。连续临界 443.18 件的最少可行整数为 444，最接近整数则为 443。成本降低项目新增 OCF 为 $Saving(1-\tau) + \tau\Delta D$，同时考虑节约提高利润的税与新增**折旧税盾**。

敏感性分析（sensitivity analysis）改变一个输入、固定其余假设；**情景分析**（scenario analysis）同时改变相关一组假设。若销量变化也改变 NWC，不可用“其他全部固定”的简化导数代替完整影响。

6.6 不同寿命与互斥项目

Different lives and mutually exclusive choices

> **PRINCIPLE** 互斥项目比较 NPV；不同寿命项目先统一服务条件。

年化资本成本金额（annualized capital cost / ACC）只将资本投入转成等额年付款；**等额年成本**（equivalent annual cost / EAC）将完整生命周期成本**现值**转成年成本。相同服务、持续需求和可重复更新条件下，较低 EAC 更好；有限服务终点须统一替换和残值，不能只比一次购买成本。

$$PV_{cost} = I_0 + \sum_{t=1}^{n} \frac{OperatingCost_t}{(1+r)^t} - \frac{SV_n}{(1+r)^n}, \qquad EAC = PV_{cost}/a_n(r).$$

独立项目（independent projects）可分别接受；**互斥项目**（mutually exclusive projects）只能选一个。在无额外约束、估值口径可比且允许不投资时，选最高正 NPV，全部负则全拒绝。IRR 不随规模同比放大而变，不能一般代表最大财富**增量**。交叉利率（crossover rate）使两个 NPV 相等，是增量现金流 NPV 为零的率，不是任一项目自身 IRR。

6.7 通胀换算要保持完整模型一致

Inflation conversion preserves the entire model

> **PRINCIPLE** 名义与实际口径须配套，历史成本折旧不自动随通胀增长。

同一确定模型的**名义现金流**（nominal cash flow）、**实际现金流**（real cash flow）与对应**贴现**率必须成套转换，通胀因子逐期约去，NPV 相同。但引入通胀可能改变原模型：历史成本折旧固定为名义额，其实际税盾会被侵蚀，不能把完整 OCF 都随物价放大。

$$\frac{CF_t^N}{(1+i_N)^t} = \frac{CF_t^R(1+\pi)^t}{[(1+i_R)(1+\pi)]^t} = \frac{CF_t^R}{(1+i_R)^t}.$$

6.8 英文概念与原理

English Definitions and Principles

1. Value comes from incremental project cash

Capital budgeting values an investment project's cash flows relative to not undertaking it. New-product projects expand activities, cost-reduction projects reduce existing expenditures, and replacement projects renew assets. Sunk costs have already occurred and cannot be changed by the current choice, so they are excluded.

Opportunity costs represent benefits forgone by using existing resources and are included. Cannibalization of existing products also changes incremental cash flow.

Revenue is quantity Q times unit price p. Variable cash cost is v times Q, while fixed cash cost is unchanged within the relevant output range. Unit contribution margin first covers fixed costs before generating operating surplus. If the first-year price is specified, subsequent prices use an exponent of t minus one.

A current price that must first be inflated to year one may instead use exponent t.

2. Accounting profit must be converted to cash

Capital expenditure pays for long-lived assets, and required installation costs enter the capitalized basis under the stated model. Depreciation allocates cost across accounting or tax periods; it is not a new equipment payment each year. Straight-line depreciation divides the depreciable basis by its allowed life.

Book value is the remaining accounting balance, whereas salvage value is sale or recovery value. A fully depreciated asset can still have a positive sale price.

EBIT is earnings before financing interest and income tax: revenue less cash operating costs and depreciation. In the simplified unlevered project model here, EAT or net income equals EBIT after income tax.

Operating cash flow measures operating cash rather than accounting profit and adds back depreciation previously deducted as a noncash expense. If after-tax earnings are supplied, they must not be taxed again.

The depreciation tax shield is the reduction in tax caused by the deduction, not a payment equal to depreciation. For revenue of 1,000, cash costs of 600, depreciation of 100, and a twenty-percent rate, EBIT is 300, tax is 60, net income is 240, and OCF is 340. Without depreciation tax would be 80, so the shield is 20.

Immediate tax benefits during losses depend on the tax setting; the closed-form expressions assume usable current shields.

3. Working capital uses cash and can release it

Net working capital measures net short-term resources tied up in operations. Its accounting definition is current assets less current liabilities; unlevered project analysis often uses operating current assets less non-interest-bearing operating liabilities.

Inventories, receivables, and required operating cash tie up funds, while payables provide financing. The balance differs from its change. Cash flow deducts only new investment, not the entire balance repeatedly.

Free cash flow here is unlevered operating cash after capital expenditure and working-capital reinvestment, available to capital providers. Working capital is not depreciated. Liquidation releases the recoverable inventory and receivables net of obligations at termination. Recovery must follow a stated assumption.

Terminal recovery supplements rather than replaces final operating cash flow.

When sale gains and losses receive immediate symmetric tax treatment, after-tax asset proceeds equal the sale price less tax on its difference from book value. Working-capital recovery ordinarily releases invested funds rather than creating another sales profit.

Write-downs or bad debts require actual recovery amounts and corresponding tax adjustments.

4. The discount rate prices comparable risk

The cost of capital is the required return for the relevant cash-flow risk and an opportunity cost. WACC weights the costs of common equity, preferred equity, and debt by market values. Weights sum to one, and debt receives an after-tax adjustment when interest is deductible.

Unlevered cash flows discounted at WACC generally exclude financing interest to avoid counting its effects twice.

Systematic or market risk remains after diversification; firm-specific risk can be diversified. Systemic risk concerns the financial system and is distinct. A discount rate reflects project cash-flow risk.

A firm's current average cost is appropriate only when a project is a compatible miniature replica of existing risk and financing assumptions.

Conventional cash flows have an initial outflow and subsequent nonnegative inflows, giving a decreasing NPV function and a unique IRR. Higher rates reduce positive future present values while leaving the initial outlay unchanged. Find IRR by testing options or bisecting opposite-sign NPVs.

A change in required return does not change IRR, allowing acceptance tests for conventional independent projects even without all the flows needed to recompute an NPV amount.

5. Break-even conditions identify a precise target

Accounting break-even sets accounting operating profit to zero, cash break-even sets OCF to zero, and financial break-even sets NPV to zero. Accounting cost coverage need not compensate capital's opportunity cost.

To infer quantity from a required OCF, remove the shield, undo the after-tax proportion, cover fixed cash costs, and divide by unit contribution margin.

These formulas assume fixed investment, level OCF, and specified terminal recovery. Sales-related working capital requires solving the complete NPV equation jointly; fixing it at the original forecast gives a different conditional solution.

A continuous threshold of 443.18 requires at least 444 whole units, though its nearest integer is 443. A cost-reducing project adds after-tax savings and the incremental depreciation shield.

Sensitivity analysis varies one input while holding the stated conditions fixed; scenario analysis varies a coherent group. When volume also affects working capital, a derivative assuming other investment inputs fixed does not measure the complete effect.

6. Different lives and mutually exclusive choices

ACC converts capital outlay into an annual amount; EAC annualizes all life-cycle costs. Lower EAC is preferable for equivalent service, continuing demand, and repeatable replacement. A finite common service horizon requires consistent replacement and residual values, rather than comparison of a single purchase alone.

Independent projects may be accepted separately; mutually exclusive projects cannot both be undertaken. With comparable assumptions, no additional constraints, and the option not to invest, select the highest positive NPV or reject all if none is positive.

IRR is invariant to proportional scaling and need not identify the largest wealth gain. A crossover rate equates project NPVs by setting the NPV of their difference to zero; it is not either project's own IRR.

7. Inflation conversion preserves the entire model

Nominal and real cash flows and rates for the same deterministic model must be converted together. Inflation factors cancel period by period, giving identical NPVs. Introducing inflation can nevertheless alter the original model: historical-cost depreciation stays fixed nominally, so its real shield erodes.

Multiplying the entire OCF by inflation can incorrectly index that shield.

C6-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-1

The objective of a firm's management is to only undertake the projects that ____ the market value of shareholders' equity.

(a) decrease

(b) do not decrease

(c) change

(d) do not change

C6-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-2

The decision rule that management uses with the net present value is to undertake only those projects with ____ NPV.

(a) discounted

(b) contingent

(c) positive

(d) negative

C6-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-3

If a firm decides to invest in automated machines that will allow the firm to reduce labor costs, this is an example of a ____ capital expenditures project.

(a) new products

(b) replacement of existing assets

(c) cost reduction

(d) advertising

C6-MC-4 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-4

The NPV of a project represents the amount by which it is expected to increase ____.

(a) the break-even point

(b) capital budgeting

(c) capital expenditures

(d) shareholder wealth

C6-MC-5 概念辨析与短计算

⋆ Bodie 2e 配套题库：C6-MC-5

Compute NPV at a cost of capital of 15%. Cash flows are in thousands of dollars.

Year	Cash flow
0	-2,000
1	1,200
2	1,500
3	1,800

(a) $5,361,000

(b) $3,548,000

(c) $3,361,000

(d) $1,361,000

C6-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-6

Compute NPV at a cost of capital of 12%. Cash flows are in thousands of dollars.

Year	Cash flow
0	-5,000
1	4,100
2	3,800
3	3,500

(a) $14,181,000

(b) $9,181,000

(c) $4,181,000

(d) $3,548,000

C6-MC-7 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-7

A negative sign in front of a cash-flow forecast for a particular year means that it is an ____.

(a) inflow

(b) outflow

(c) indeterminate flow

(d) more information is required to make this determination

C6-MC-8 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-8

Net cash inflows from operations can be computed in which of the following ways?

(a) Cash Flow = Revenue – Cash Expenses – Taxes

(b) Cash Flow = Net Income + Noncash Expenses

(c) Cash Flow = Revenue – Total Expenses – Taxes + Noncash Expenses

(d) all of the above

C6-MC-9 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-9

Consider the development of a new type of laptop machine. In your estimates you determine that you will sell 5,000 laptop units per year at a price of $2,500 per laptop. Production equipment will have to be purchased at a cost of $2 million. The equipment will be depreciated over five years using the straight-line method. Net working capital of $1.9 million will also required to finance this project. The cash expenses for this project are $1,700 per laptop. The tax rate is 40%.

Compute the net cash inflows from operations.

(a) $4 million

(b) $2.56 million

(c) $2.16 million

(d) $1.76 million

C6-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-10

Consider the development of a new type of laptop machine. In your estimates you determine that you will sell 5,000 laptop units per year at a price of $2,500 per laptop. Production equipment will have to be purchased at a cost of $2 million. The equipment will be depreciated over five years using the straight-line method. Net working capital of $1.9 million will also required to finance this project. The cash expenses for this project are $1,700 per laptop. The tax rate is 40%.

Refer to question 9. What is the annual depreciation amount for this project?

(a) $4 million

(b) $1 million

(c) $0.78 million

(d) $0.4 million

C6-MC-11 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-11

Consider the development of a new type of laptop machine. In your estimates you determine that you will sell 5,000 laptop units per year at a price of $2,500 per laptop. Production equipment will have to be purchased at a cost of $2 million. The equipment will be depreciated over five years using the straight-line method. Net working capital of $1.9 million will also required to finance this project. The cash expenses for this project are $1,700 per laptop. The tax rate is 40%.

Refer to question 9. If we use a cost of capital equal to 13%, what is the NPV for this project?

(a) $2.3 million

(b) $3.7 million

(c) $5.1 million

(d) $9 million

C6-MC-12 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-12

In computing a project's cost of capital the risk to use is ____.

(a) the risk of the financing instruments used to fund the project

(b) the risk of the project's cash flows

(c) risk-free rate

(d) historical risk rate using T-bills

C6-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-13

A capital budgeting project's cost of capital should reflect only the ____ risk of the project, not the project's ____ risk.

(a) unsystematic, systematic

(b) unsystematic, market-related

(c) systematic, unsystematic

(d) systematic, market-related

C6-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-14

The point of indifference between accepting and rejecting a project is referred to as the ____ point.

(a) payback

(b) NPV

(c) rejection

(d) break-even

C6-MC-15 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-15

Consider a project that has total fixed costs of $400,000, an annual depreciation (based on the straight-line method) of $150,000, annual cash flows of $255,000, and a tax rate of 34%. The difference between the revenue and variable cost (on a per unit basis) is $1,600 (so we use 1,600Q). Determine the break-even volume for this project.

(a) Q = 443 units

(b) Q = 349 units

(c) Q = 230 units

(d) Q = 194 units

C6-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-16

For a project, an initial cash outlay of $1.4 million is made. In year 1 the expected annual cash flow is $900,000, years 2-5 the expected annual cash flow is $1,000,000 and in year 6 the expected annual cash flow is $1.3 million. A cost of capital of 15% is used. The IRR (internal rate of return) is ____.

(a) 72.1%

(b) 65.8%

(c) 51.7%

(d) 40.0%

C6-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-17

An initial cash outlay of $1.4 million is made for a capital budgeting project. In year 1, the expected annual cash flow is $900,000, years 2-5, the expected annual cash flow is $1,000,000 and in year 6, the expected annual cash flow is $1.3 million. If a cost of capital of 15% is used, compute the NPV of this project.

(a) $1,800,000

(b) $2,100,000

(c) $2,427,225

(d) $3,296,790

C6-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-18

The ____ is defined as the annual cash payment that has a present value equal to the initial outlay.

(a) annualized cost of debt

(b) cost of debt

(c) cost of financing

(d) annualized capital cost

C6-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-19

Project A has an initial $3.5 million capital outlay which is converted into an equivalent seven year annuity at a discount rate of 12% per year. Project B has a $7 million initial capital outlay and will last for 14 years. Project B has the same discount rate as Project A.

What is the preferred alternative based on the annualized capital cost?

(a) Project A; its annualized capital cost = $528,050

(b) Project A; its annualized capital cost = $766,912

(c) Project B; its annualized capital cost = $1,056,099

(d) Project B; its annualized capital cost = $1,533,824

C6-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-20

Project A has an initial capital outlay of $3 million. It will be converted into an equivalent 5 year annuity at a discount rate of 12% per year. Project B has an initial capital outlay of $6 million. It will be a ten year annuity at the same discount rate as Project A.

What are the annualized capital costs of both projects?

(a) Project A: $832,229 Project B: $1,664,458

(b) Project A: $530,952 Project B: $1,664,458

(c) Project A: $832,229 Project B: $1,061,905

(d) Project A: $530,952 Project B: $1,061,905

C6-MC-21 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-21

In comparing alternative annualized capital costs, the alternative with the ____ annualized capital cost is the preferred alternative.

(a) lowest

(b) highest

(c) zero

(d) amortized

C6-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-22

A project's IRR is ____ its scale, which makes IRR not a good measure for ranking mutually exclusive projects.

(a) contingent on

(b) independent of

(c) inversely proportional to

(d) half of

C6-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-23

The ____ rate is the rate that prevails in a zero-inflation scenario. The ____ rate is the rate that one actually observes.

(a) nominal, inflation

(b) real, expected

(c) nominal, real

(d) real, nominal

C6-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-24

If the nominal cost of capital is 16% per year and the expected rate of inflation is 5% per year, then compute the real cost of capital.

(a) 21.8%

(b) 11.5%

(c) 11%

(d) 10.5%

C6-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-25

The nominal rate of interest is 15.7% and the expected rate of inflation is 6%. Compute the real rate of return.

(a) 22.6%

(b) 10.9%

(c) 9.15%

(d) 7.85%

C6-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-26

Initial outlay: 1,500,000; real cost of capital: 11%; inflation: 5%.

Year	Real cash flow	Nominal cash flow
1	800,000	840,000
2	800,000	882,000
3	800,000	926,100
4	800,000	972,405

Determine the nominal cost of capital.

(a) 16.55%

(b) 15.45%

(c) 11.66%

(d) 5.7%

C6-MC-27 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-27

Initial outlay: 1,500,000; real cost of capital: 11%; inflation: 5%.

Year	Real cash flow	Nominal cash flow
1	800,000	840,000
2	800,000	882,000
3	800,000	926,100
4	800,000	972,405

Compute the NPV of the real cash flows.

(a) $714,189

(b) $981,957

(c) $1,009,971

(d) $1,290,317

C6-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-28

Initial outlay: 1,500,000; real cost of capital: 11%; inflation: 5%.

Year	Real cash flow	Nominal cash flow
1	800,000	840,000
2	800,000	882,000
3	800,000	926,100
4	800,000	972,405

Compute the NPV of the nominal cash flows.

(a) $714,189

(b) $981,957

(c) $1,009,971

(d) $1,290,317

C6-MC-29 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-29

How can NPV be properly calculated?

(a) by using the nominal cost of capital to discount nominal cash flows

(b) by using the real cost of capital to discount real cash flows

(c) neither (a) nor (b)

(d) both (a) and (b)

C6-MC-30 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-30

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year. There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%. What is the annual depreciation?

(a) $0.62 million

(b) $0.81 million

(c) $0.92million

(d) $1.54 million

C6-MC-31 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-31

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year. There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%. What is the net cash flow in year 1?

(a) $1.428 million

(b) $1.548 million

(c) $2.048 million

(d) $2.458 million

C6-MC-32 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-32

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year. There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%. What is the total cash flow in year 3?

(a) $1.428 million

(b) $1.548 million

(c) $2.048 million

(d) $2.458 million

C6-MC-33 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-33

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year. There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%. What is the total cash flow in year 5?

(a) $2.048 million

(b) $2.548 million

(c) $3.548 million

(d) $4.048 million

C6-MC-34 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-34

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year. There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%. Which is closest to the NPV of the project?

(a) $2.34 million

(b) $2.78 million

(c) $3.47 million

(d) $3.92 million

C6-MC-35 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-35

A new type of candy bar is being considered by ChocoLicious. This project is completely independent of all the other projects at ChocoLicious. An outlay of $3.1 million is required for equipment to produce the new product, and additional net working capital in the amount of $1.5 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in five years and the equipment will be fully depreciated over fiver years using the straight-line method. Revenues are expected to be $5 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $2 million per year.

There will be an additional $0.5 million working capital requirement during the first year, and no working capital additions beyond that time. The required rate of return for this project is 12% and the relevant tax rate is 40%.

What is the IRR of project?

(a) 34.35%

(b) 35.23%

(c) 37.35%

(d) 39.29%

C6-MC-36 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-36

Apex Corporation is considering the purchase of Zenith Corporation. The owners of Zenith Corporation are asking $75 million in cash and the managers of Apex Corporation estimate that, once under their control, Zenith Corporation will generate cash flows of $20 million per year for five years. The cash flows are net of taxes. The IRR of this investment is ____.

(a) 8.17%

(b) 10.42%

(c) 15.34%

(d) 20%

C6-MC-37 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-37

BGB Corporations is considering a project that will pay nothing for the first three years, $80,000 in the fourth year, $120,000 in the fifth year, and $160,000 in the sixth year. The appropriate discount rate is 8.8% and the project requires an investment tomorrow of $150,000 if we accept the project. The NPV of this project is:

(a) $149,135

(b) $124,939

(c) $94,901

(d) $82,263

C6-MC-38 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-38

NetProducts Inc. is considering installing a new server. The new machine costs $61,000 and is expected to have a useful economic life of 5 years, after which it will have a book value of $0. In addition to the equipment costs, management expects installation costs of $9,000 and an initial outlay for net working capital of $7,000. The new server is expected to generate an additional $16,000 per year in earnings after tax over its useful life, but an additional $4,000 per year is required in net working capital.

The net working capital will be recovered by the end of the fifth year. NetProducts Inc. has cost of capital (k) of 20%. What is the net cash flow in year 1?

(a) $12,000

(b) $26,000

(c) $30,000

(d) $34,000

C6-MC-39 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-39

NetProducts Inc. is considering installing a new server. The new machine costs $61,000 and is expected to have a useful economic life of 5 years, after which it will have a book value of $0. In addition to the equipment costs, management expects installation costs of $9,000 and an initial outlay for net working capital of $7,000. The new server is expected to generate an additional $16,000 per year in earnings after tax over its useful life, but an additional $4,000 per year is required in net working capital.

The net working capital will be recovered by the end of the fifth year. NetProducts Inc. has cost of capital (k) of 20%. What is the total cash flow in year 5?

(a) $26,000

(b) $30,000

(c) $46,000

(d) $53,000

C6-MC-40 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-40

NetProducts Inc. is considering installing a new server. The new machine costs $61,000 and is expected to have a useful economic life of 5 years, after which it will have a book value of $0. In addition to the equipment costs, management expects installation costs of $9,000 and an initial outlay for net working capital of $7,000. The new server is expected to generate an additional $16,000 per year in earnings after tax over its useful life, but an additional $4,000 per year is required in net working capital.

The net working capital will be recovered by the end of the fifth year. NetProducts Inc. has cost of capital (k) of 20%. What is the NPV of this project?

(a) $11,606.59

(b) $8,793.45

(c) $5,176.55

(d) $755.90

C6-MC-41 概念辨析与短计算

Bodie 2e 配套题库；C6-MC-41

NetProducts Inc. is considering installing a new server. The new machine costs $61,000 and is expected to have a useful economic life of 5 years, after which it will have a book value of $0. In addition to the equipment costs, management expects installation costs of $9,000 and an initial outlay for net working capital of $7,000. The new server is expected to generate an additional $16,000 per year in earnings after tax over its useful life, but an additional $4,000 per year is required in net working capital.

The net working capital will be recovered by the end of the fifth year. NetProducts Inc. has cost of capital (k) of 20%. What is the IRR of this project?

(a) 30.03%

(b) 26.01%

(c) 22.88%

(d) 20.45%

C6-SHORT-2 方法练习

Bodie 2e 配套题库；C6-SHORT-2

Compare the following after-tax cash flows (millions) at 11%. Which project has higher NPV? If mutually exclusive, choose one; if independent, state the acceptance decision.

Year	A	B
0	-9	-9
1	2	4
2	2.5	3.5
3	3	3
4	3.5	2.5
5	4	2

C6-SHORT-3 方法练习

Bodie 2e 配套题库；C6-SHORT-3

Consider an investment that requires an initial outlay of $3 million. In the absence of inflation this investment is expected to produce an annual after-tax cash flow of $800,000 for six years. The cost of capital for this project is 12%. Compute the NPV and internal rate of return (IRR) of this investment. Does this seem a worthwhile investment?

C6-SHORT-6 方法练习

Bodie 2e 配套题库；C6-SHORT-6

A firm is considering investing $15 million in machinery equipment that is expected to have a useful life of five years and is expected to reduce the firm's labor costs by $5 million per year. Assume the firm pays a 35% tax rate on accounting profits and uses the straight-line depreciation method. What is the after-tax cash flow from the investment in years 1 through 5? If the hurdle rate for this investment is 16% per year, is it worthwhile?

What are the investment's IRR and NPV?

C6-SHORT-7 方法练习

Bodie 2e 配套题库；C6-SHORT-7

Consider two projects but the projects last for different periods of time. Project A has an initial outlay of $5 million and is expected to generate an equivalent 5 year annuity at a discount rate of 11%. Project B requires twice the initial outlay, but will last ten years at the same discount rate.

Which is the preferred project based on annualized capital cost?

C6-SHORT-8 方法练习

Bodie 2e 配套题库；C6-SHORT-8

The following projects are mutually exclusive. At the stated 10% cost of capital, which should be accepted?

Project	Initial investment	NPV	IRR
A	1,000,000	100,000	10.2%
B	100	1	11%
C	50,000	70,000	23%
D	200,000	24,000	13%

C6-SHORT-9 方法练习

Bodie 2e 配套题库；C6-SHORT-9

At 10%, choose between the following mutually exclusive projects.

Year	A	B
0	-50,000	-50,000
1	0	15,625
2	0	15,625
3	0	15,625
4	0	15,625
5	99,500	15,625

C6-SHORT-10 方法练习

Bodie 2e 配套题库；C6-SHORT-10

The following projects are mutually exclusive. At the stated 9% cost of capital, which should be accepted?

Project	Initial investment	NPV	IRR
A	100	1	11%
B	25,000	35,000	23%
C	500,000	50,000	10.2%
D	100,000	12,000	13%

C6-SHORT-11 方法练习

Bodie 2e 配套题库；C6-SHORT-11

Licorice considers two mutually exclusive projects. The cost of capital is 15%. Which should be accepted?

Year	A	B
0	-100,000	-100,000
1	55,000	35,000
2	45,000	38,000
3	40,000	41,000
4	35,000	42,000
5	0	45,000

C6-SHORT-12 方法练习

Bodie 2e 配套题库；C6-SHORT-12

Pluto Inc. is considering the purchase of Neptune Corp. The owners of Neptune Corp. are asking for $150 million in cash. The managers of Pluto estimate that, under their control, Neptune Corp. will generate cash flows of $12 million per year for five years and then be sold for $200 million. The IRR of this investment is:

C6-SHORT-13 方法练习

Bodie 2e 配套题库；C6-SHORT-13

Licorice considers two independent projects. The cost of capital is 9%. Which should be accepted?

Year	A	B
0	-100,000	-100,000
1	55,000	35,000
2	45,000	38,000
3	40,000	41,000
4	35,000	42,000
5	0	45,000

C6-SHORT-14 方法练习

Bodie 2e 配套题库；C6-SHORT-14

Oscar's Corp. is considering starting a new business involving bicycle production. This new business involves purchases of $8 million of new equipment. This new business is anticipated to generate net income of $1.43 million per year for 6 years. The company uses straight-line depreciation to zero salvage value for tax purposes.

Assuming a 30 percent tax rate and a 10 percent discount rate, calculate the project's IRR.

C6-SHORT-15 方法练习

Bodie 2e 配套题库；C6-SHORT-15

Brunhilde Corporation is considering a project that will pay $10,000 at the end of the first year, $20,000 at the end of the second year, and $40,000 at the end of the third year. The project's appropriate discount rate is 11% and it will require an investment tomorrow of $50,000 if accepted. Calculate the NPV of this project.

C6-SHORT-16 方法练习

Bodie 2e 配套题库；C6-SHORT-16

A project has the following cash flows. The cost of capital is 13% and NPV is $-2,663.48$. Calculate the missing cash flow in Year 4.

Year	Cash flow
0	-24,300
1	10,800
2	6,000
3	2,600
4	x
5	9,300

C6-SHORT-17 方法练习

Bodie 2e 配套题库；C6-SHORT-17

The following conventional independent projects were evaluated at 16%, but the correct cost of capital is 10%. Which should be accepted?

Project	Initial investment	NPV at 16%	IRR
A	1,000,000	-200,000	13.9%
B	4,000,000	-900,000	11.1%
C	2,000,000	-180,000	8.4%

C6-SHORT-18 方法练习

Bodie 2e 配套题库；C6-SHORT-18

Two machines deliver the same service, with at least 15 years of demand and repeatable replacement. At 10%, which machine should be selected?

Item	A	B
Acquisition cost	50,000	70,000
Annual operating cost	10,000	9,000
Life (years)	3	5
Salvage	0	0

C6-SHORT-19 方法练习

Bodie 2e 配套题库；C6-SHORT-19

The following conventional independent projects were evaluated at 17%, but the correct cost of capital is 10%. Which should be accepted?

Project	Initial investment	NPV at 17%	IRR
A	2,000,000	-1,470,000	8.4%
B	6,000,000	-1,200,000	11.1%
C	1,500,000	-450,000	13.9%

C6-SHORT-20 方法练习

Bodie 2e 配套题库；C6-SHORT-20

Makine Corp. is considering a new business. This business involves startup costs of $13 million. This business is anticipated to generate net income of $1.35 million per year for 13 years. The company uses straightline depreciation to zero salvage value for tax purposes. Assuming a 30 percent tax rate and a 10 percent discount rate, calculate the project's NPV.

C6-LONG-1 综合计算

Bodie 2e 配套题库；C6-LONG-1

Reyes Inc. is considering investing $8 million in computer equipment that is expected to have a useful life of 4 years, and is expected to reduce the firm's labor costs by $3 million per year. Assume that Reyes, Inc. pays a 35% tax rate on accounting profits and uses the straight-line depreciation method. What is the after-tax cash flow from the investment in years 1 through 4? If the firm's hurdle rate for the project is 14% per year is it worthwhile?

What are the investment's NPV and IRR?

C6-LONG-1 Working space

C6-LONG-2 综合计算

Bodie 2e 配套题库；C6-LONG-2

Consider a project which involves an initial outlay of $5 million and which will generate an expected annual cash flow of $1.6 million. The cost of capital used is 13%. This project will last 6 years. (a) Compute the project's NPV (b) Compute the IRR

C6-LONG-2 Working space

C6-LONG-3 综合计算

Bodie 2e 配套题库；C6-LONG-3

Sound Wired Corporation is considering an investment of $1,000,000 in equipment for producing a new type of compact disc. The equipment has an expected life of five years. Sales are expected to be 150,000 units per year at a price of $25 per unit. Fixed costs excluding depreciation of the equipment are $300,000 per year, and variable costs are $13 per unit. The equipment will be depreciated over five years using the straight-line method with a zero salvage value.

Working capital requirements are assumed to be 1/12 of annual sales. The market capitalization rate for the project is 17% per year, and the corporation pays income tax at the rate of 35%. What is the project's NPV? What is the break-even volume?

C6-LONG-3 Working space

C6-LONG-4 综合计算

Bodie 2e 配套题库；C6-LONG-4

Investment and depreciation

In anticipation of the year 2008 Olympics in Beijing, China, TingTing Inc. is considering getting into the souvenir business. One idea under consideration is the production of panda bear statuettes. A machine costing $60,000 will have to be purchased and this new machine will have a life of three years (for both actual and tax purposes) and after three years the machine will have zero salvage value. In terms of depreciation, the machine will be depreciated on a straight-line basis.

Operating assumptions

TingTing Inc. believes it can sell 5,000 souvenir statues per year at a price of $15 each.

For each statue the variable costs are $3 and fixed expenses (this does not include depreciation) will be $4,000 per year. The cost of capital for TingTing Inc. is 14% and the tax rate is 35%. The figures given above assume that there will be no inflation.

Tasks without inflation

(a) Compute the series of expected cash flows.

(b) Compute the project's NPV. Is it a worthwhile project?

(c) What is the NPV breakeven quantity?

Inflation scenario

Now assume that over the next three years the expected rate of inflation is 7% per year. Also assume that in this environment both revenues and nondepreciation expenses increase at that rate and the cost of capital remains the same.

Tasks with inflation

(d) Compute the series of expected nominal cash flows.

(e) Compute the NPV of nominal cash flows. Is the project worth undertaking?

C6-LONG-4 Working space

C6-LONG-5 综合计算

Bodie 2e 配套题库；C6-LONG-5

A new type of beverage is being considered by Chateau Ultimo. This project is completely independent of all the other projects at Chateau Ultimo. An outlay of $4.2 million is required for equipment to produce the new product, and additional net working capital in the amount of $3 million is also required. The firm will recover all working capital at the end of the project.

The project will be terminated in six years and the equipment will be fully depreciated over six years using the straight-line method. Revenues are expected to be $8 million per year during the project, while operating expenses (excluding depreciation) for the project are expected to be $5 million per year. There will be an additional $1 million working capital requirement during the first year, and no working capital additions beyond that time.

The required rate of return for this project is 11% and the relevant tax rate is 40%. Calculate the NPV of this project.

C6-LONG-5 Working space

C6-LONG-6 综合计算

Bodie 2e 配套题库；C6-LONG-6

Nanz Inc. is considering installing a new server. The new machine costs $75,000 and is expected to have a useful economic life of 6 years, after which it will have a book value of $0. In addition to the equipment costs, management expects installation costs of $8,000 and an initial outlay for net working capital of $13,000. The new server is expected to generate an additional $24,000 per year in earnings after tax over its useful life, but an additional $6,000 per year is required in net working capital.

Net working capital will be recovered at the end of six years. Assume that Nanz has a cost of capital (k) of 17.5%. Calculate the NPV and IRR for this project.

C6-LONG-6 Working space

C6-LONG-7 综合计算

Bodie 2e 配套题库；C6-LONG-7

A new type of T-shirt is being considered by ActiveWear Textiles Corp. This project is completely independent of all the other projects at ActiveWear. An outlay of $15 million is required for equipment to produce the new product and additional net working capital in the amount of $3.2 million is also required. The firm will recover the $3.2 million in working capital at the end of the project. The project will be terminated in six years and the equipment will be fully depreciated over six years using the straight-line method. Revenues minus operating expenses for the project are expected to be $5 million per year.

There will be no working capital requirements during the project (except for the $3.2 million at the beginning). The required rate of return on this project is 16% and the tax rate is 35%. Determine whether this project should be accepted by computing its NPV and IRR.

C6-LONG-7 Working space

C6-LONG-8　综合计算

Bodie 2e 配套题库；C6-LONG-8

An investment requires an initial outlay of 3,500,000. Five annual real cash flows are each 900,000. Expected annual inflation is 7%, and the real cost of capital is 12%. Compute NPV using both real and nominal cash flows, converting the latter without premature rounding.

C6-LONG-8 Working space

SYN-2 跨期综合问题

⋆ 原重点标记版综合题；SYN-2

Suppose you have the following two mutually exclusive projects: build a day care center or a health spa. Suppose the day care center has the following cash flows: an immediate cash outlay of $5,000 followed by inflows of $2,500 in each of the next 3 years and zero thereafter.

Suppose the health spa has the following cash flows: an immediate outlay of $5,000 followed by inflows of nothing in year one, $1,000 in year 2 and $7,100 in year 3 and zero thereafter. Answer the following questions.

Year	Day care center ($)	Health spa ($)
0	−5,000	−5,000
1	2,500	0
2	2,500	1,000
3	2,500	7,100

(a) Confirm that the IRR of the day care project is 23.375%.

(b) Is the IRR for the health spa lower or higher than the IRR for the day care project?

If you base your investment decision on which project has the highest IRR, which do you choose? (Hint: you do not have to calculate the IRR for the health spa for this question.)

(c) If you base your investment decision on which investment has the highest NPV, which do you choose when the cost of capital is 15% and which do you choose if the cost of capital is 5%?

SYN-2 Working space

F-HW02-03 现金流目标与销量

Required Cash Flow and Sales Volume

⋆ 2026 HW2；Part I 3

Consider a project that has total fixed costs of \$400,000, an annual depreciation (based on the straight-line method) of \$150,000, annual cash flows of \$255,000, and a tax rate of 34%. The difference between the revenue and variable cost (on a per unit basis) is \$1,600 (so we use $1,600Q$).

Determine the break-even volume for this project.

A. $Q = 443$ units

B. $Q = 349$ units

C. $Q = 230$ units

D. $Q = 194$ units

F-HW02-04 内部收益率

Internal Rate of Return

⋆ 2026 HW2；Part I 4

For a project, an initial cash outlay of $1.4 million is made. In year 1 the expected annual cash flow is $900,000, years 2–5 the expected annual cash flow is $1,000,000 and in year 6 the expected annual cash flow is $1.3 million. A cost of capital of 15% is used. The IRR (internal rate of return) is _____.

A. 72.1%

B. 65.8%

C. 51.7%

D. 40.0%

F-HW02-07 机器投资净现值

Dickinson Brothers: Machine Investment

⋆ 2026 HW2；Part II 2

Dickinson Brothers, Inc., is considering investing in a machine to produce computer keyboards. The price of the machine will be $500,000 and its economic life is five years. The machine will be fully depreciated by the straight-line method. The machine will produce 10,000 keyboards each year. The price of each keyboard will be $40 in the first year, and will increase by 5 percent per year. The production cost per keyboard will be $20 in the first year and will increase by 10 percent per year.

There are no other costs for the project. The corporate tax rate for the company is 34 percent. If the appropriate discount rate is 15 percent, what is the NPV of the investment?

F-HW02-07 Working space

第 7 章　市场估值原理

Principles of Market Valuation

依据：Bodie 2e Ch7；配套题库 Ch7

等价资产 → 一价定律 → 汇率换算 → 可比估值 → 信息与国际平价

7.1　等价索取权与一价定律

Equivalent claims restrict relative prices

> **PRINCIPLE**　等价现金流约束相对价格；套利利润还须扣除执行成本。

基本价值（fundamental value）根据未来**现金流**、风险和可用信息估计，**市场价值**（market value）由交易价决定，账面价值（book value）依据会计记录。估值（valuation）方法取决于信息：现金流支持贴现法，可比交易支持倍数法。复制组合（replicating portfolio）在每个日期、每种状态与目标资产提供相同现金流；一价定律（Law of One Price）在无摩擦且交易可执行条件下要求二者价格相同。

套利（arbitrage）用同时可锁定的等价交易获得确定净利润；**投机**（speculation）承担未来价格风险。多头（long position）受益于标的上涨，空头（short position）承担相反方向。**卖空**（short selling）通常借入证券卖出、以后买回归还。若套利需要卖出自己尚未持有的证券，必须能够卖空或取得可交割库存；只看到两个报价不同还不足以证明能套利。

交易成本（transaction costs）包括双边经纪费（brokerage fees）、运输（shipping）、保管或处理（handling）及保险（insurance）。先统一币种和资产单位，再以高价卖出净收入减低价买入总支出。费用按各端交易金额计，不能只对价差扣一次。交易费使无**套利**条件形成一个价格带，而非要求中间报价绝对相同。

$$\Pi = P_H(1 - c_H) - P_L(1 + c_L).$$

只有 $\Pi > 0$，这一方向才有净利润。利率**套利**（interest-rate arbitrage）在可比货币、期限、信用条件下低息借入高息投资。信用卡与存款题用同一笔 X 比较避免的卡息与放弃的存息，净节约为 $X(r_{card} - r_{deposit})$。**本金**偿还不是每年重复发生的成本，全部存款也不必都取出。

7.2 汇率单位决定乘除

Currency units determine the conversion

> **PRINCIPLE** 汇率乘除按单位消去原币，最终留下所求货币。

汇率 $X_{A/B}$ 表示 1 单位 B 换多少 A，单位 A/B。有 B 换 A 时乘该报价，有 A 换 B 时除。直接报价（direct quote）与间接报价（indirect quote）相对于观察者本币定义。**交叉汇率**（cross exchange rate）借共同货币相约，反向汇率则取倒数。不能依数字大小或句子中货币出现顺序决定乘除。

$$X_{A/C} = X_{A/B} X_{B/C}, \qquad X_{B/A} = 1/X_{A/B}.$$

货币代码包括 USD（United States dollar，美元）、CNY（Chinese yuan，人民币元）、JPY（Japanese yen，日元）、EUR（euro，欧元）、GBP（pound sterling，英镑）、CAD（Canadian dollar，加元）、AUD（Australian dollar，澳元）、CHF（Swiss franc，瑞士法郎）、DKK（Danish krone，丹麦克朗）、MXN（Mexican peso，墨西哥比索）、ILS（Israeli shekel，以色列谢克尔）、ANG（Netherlands Antillean guilder，荷属安的列斯盾）与历史 FRF（French franc，法国法郎）。Kranes 是题中虚构当地货币，按题给单位计算。

三角套利（triangular arbitrage）按三币种形成闭环，每步写成目标货币/原货币，最终回到原币才能比较利润。中间数量变大可能只是换成面额小的货币。黄金**套利**把盎司（ounce / oz）黄金作为中间资产，按一市场买价求数量、另一市场卖价求金额，再换回原币。每步扣比例费用时，要乘各步的 $1 - c_j$。

$$G = X_{B/A} X_{C/B} X_{A/C}, \qquad V_{end} = V_0 G \prod_j (1 - c_j).$$

Bid（交易商买入价）与 ask（交易商卖出价）以交易商为参照。按本币/外币报价，客户卖外币乘 bid，客户买外币除 ask；买卖价差（bid-ask spread）为两报价差。用不可执行的中间价构造出盈利，不代表实际有净**套利**。

7.3 每股收益、倍数与价值

Multiples connect earnings and value

> **PRINCIPLE** 同口径指标乘可比倍数；每股价、总市值与资本化率须区分。

每股收益（earnings per share / EPS）为归属**普通股**的利润除相应普通股数；股息（dividend）只是分配金额，不等于全部每股利润。**市盈率**（price-earnings ratio / P/E multiple）是价格对年度每股利润的倍数，因此可比股价估计为 EPS 乘适当 P/E。总市值（market capitalization）是每股价乘发行在外股数，资本化率（capitalization rate）是收入对价值的比率，两者单位不同。

$$EPS = NI_{common}/N, \quad \widehat{P} = EPS(P/E)_{comp}, \quad MarketCap = PN.$$

销售额倍数（sales multiple）、**账面价值**倍数（book-value multiple）和净利润倍数（earnings multiple）把可比交易价与相应指标联系。成长机会（growth opportunities）、风险、杠杆和会计利润质量不同，同行也有不同倍数。利润为零或负时 P/E 解释受限。**企业价值**（enterprise value / EV）与**股权价值**（equity value）边界不同，EV 倍数不能直接与股东净利润倍数混用，必要时要按净债务等调整。

7.4 公告、预期与有效市场

Announcements change information and expectations

> **PRINCIPLE** 公告要区分机械与信息效果，有效性要说明信息集合。

拆股（stock split）改变股数单位：2-for-1 即每 1 股变 2 股，纯机械效果是股数翻倍、每股理论价减半、**总市值**不变。**增发**（equity issuance）引入新股与资金，股息公告（dividend announcement）改变分配信息；它们还可能是信号（signal），改变对未来盈利和风险的预期。信息效应与机械变换应分开，不能推导出拆股必增总价值或增发必跌的普遍规律。

有效市场假说（efficient markets hypothesis / EMH）讨论价格反映的信息集合。**弱式**（weak form）涉及历史交易信息，**半强式**（semi-strong form）涉及全部公开信息，强式（strong form）还包括私人信息。题库“all publicly available information”对应半强式。有效允许正常风险回报，但已公开信息难持续提供扣

除风险与费用后的异常收益（abnormal return）；它也不保证每个事前预测事后都正确。

7.5 国际平价与购买力

International parity compares purchasing power

> **PRINCIPLE** 购买力平价联系商品价格，实际利率平价联系购买力回报。

购买力平价（purchasing power parity / PPP）令相同商品篮子经共同货币转换后价格相等。本币/外币汇率为 S，物价为 $\mathcal{P}_D, \mathcal{P}_F$，则 $S = \mathcal{P}_D/\mathcal{P}_F$。本国通胀更高时该报价上升，表示本币贬值（depreciation），外币升值（appreciation）。这是相应商品市场模型，并非任意现实价格指数每天精确满足的保证。

$$S = \frac{\mathcal{P}_D}{\mathcal{P}_F}, \qquad \frac{S_1}{S_0} = \frac{1+\pi_D}{1+\pi_F}.$$

实际利率平价（real interest-rate parity）在资本流动、风险与购买力可比条件下，使各国无风险实际率相同。再用 Fisher 关系换成各币种名义率，名义利率可因通胀不同而不同。PPP 联系商品价格，实际利率平价联系购买力回报，**抛补利率平价**联系锁定**远期汇率**与金融回报，三者依赖不同条件，不能作为无条件短期汇率预测。

$$1 + i_{N,D} = (1 + r^*)(1 + \pi_D), \qquad 1 + i_{N,F} = (1 + r^*)(1 + \pi_F).$$

7.6 英文概念与原理

English Definitions and Principles

1. Equivalent claims restrict relative prices

Fundamental value estimates future cash flows and risk using available information, market value uses traded prices, and book value uses accounting records. Valuation methods depend on information: cash flows support discounting and comparable transactions support multiples.

A replicating portfolio matches the target asset's cash flow at every relevant date and state. The Law of One Price equates their prices under frictionless executable trading.

Arbitrage locks in a net gain using equivalent executable trades, whereas speculation bears uncertain future prices. A long position benefits from price increases and a short position has the opposite exposure. Short selling generally borrows an asset for sale and later buys it back for return.

A strategy selling assets not already owned requires borrowing or deliverable inventory. Different quoted prices alone do not prove an executable arbitrage.

Transaction costs include brokerage, shipping, handling, insurance, and other expenses. First put quotes in the same currency and asset unit, then subtract total purchase cost from net sale proceeds. Fees are charged on each transaction, not once on the difference.

These costs create a no-arbitrage price band rather than requiring identical quoted prices.

A positive net difference is required for this direction to be profitable. Interest-rate arbitrage compares low-cost borrowing with higher-return investment under compatible currency, maturity, and credit conditions. Deposit-versus-card problems compare avoided card interest with forgone deposit interest on the same amount X.

Principal repayment is not a repeated annual cost, and the entire deposit need not be withdrawn.

2. Currency units determine the conversion

An exchange rate with units A per B gives units of A per unit of B. Multiply it to convert B to A and divide it to convert A to B. Direct and indirect quotation are relative to the observer's domestic currency. Cross rates eliminate a common currency, while reverse rates are reciprocals.

The size of the number or order of words does not determine the operation.

Currency codes specify the monetary units in quotations: USD denotes the United States dollar; CNY the Chinese yuan; JPY the Japanese yen; EUR the euro; GBP pound sterling; CAD and AUD Canadian and Australian dollars; CHF the Swiss franc; DKK the Danish krone; MXN the Mexican peso; ILS the Israeli shekel; ANG the Netherlands Antillean guilder; and FRF the historical French franc.

Kranes is a fictional local currency and is converted according to its stated quote.

Triangular arbitrage forms a closed currency path. Each rate uses destination currency over origin currency, and profit is measured only after returning to the starting currency. A larger intermediate number may reflect a smaller monetary unit.

Gold arbitrage uses ounces as an intermediate asset: buy a quantity, sell equivalent gold in another market, and convert back. Separate proportional fees apply at every step.

Bid and ask are from the dealer's perspective. With domestic currency quoted per foreign unit, a customer selling foreign currency multiplies by the bid, while a customer buying it divides by the ask. The bid-ask spread is their difference. A profit constructed from non-executable midpoint rates need not be an actual arbitrage.

3. Multiples connect earnings and value

EPS divides earnings available to common shareholders by the relevant shares. Dividends are distributions and need not equal earnings per share. P/E relates price to annual per-share earnings, so comparable valuation multiplies EPS by an appropriate P/E.

Market capitalization multiplies share price by outstanding shares, whereas a capitalization rate divides income by value. They have different units.

Sales, book-value, and earnings multiples relate comparable transaction value to the respective measure. Firms within one industry can differ in growth, risk, leverage, or earnings quality and have different multiples. P/E is difficult to interpret with zero or negative earnings.

Enterprise value and equity value cover different claims, so enterprise multiples cannot be mixed with shareholder-earnings multiples without net-debt and other appropriate adjustments.

4. Announcements change information and expectations

A two-for-one stock split doubles shares and mechanically halves per-share value without changing total capitalization. Equity issuance creates shares and funding; a dividend announcement conveys distribution information. Such events may also signal future earnings or risk.

Information effects must be distinguished from mechanical share changes, so unconditional price predictions cannot be inferred from the event label alone.

The EMH specifies an information set. Weak-form efficiency concerns historical trading information, semi-strong efficiency concerns all public information, and strong-form efficiency additionally includes private information. The test-bank phrase all publicly available information describes the semi-strong form.

Efficiency allows normal risk compensation but questions persistent risk-adjusted excess gains from public information after costs. It does not require every forecast to prove correct afterward.

5. International parity compares purchasing power

PPP equates prices of a comparable goods basket after conversion to one currency. The domestic-currency price of foreign currency equals the domestic-to-foreign price-level ratio. Higher domestic inflation raises this quotation, indicating domestic depreciation and foreign appreciation.

The relation belongs to a specified goods-market model rather than guaranteeing exact daily equality of arbitrary price indexes.

Real interest-rate parity equates risk-free real returns under compatible capital mobility, risk, and purchasing-power conditions. The Fisher relation converts that common real rate into currency-specific nominal rates, which differ with inflation.

PPP concerns goods prices, real parity concerns purchasing-power returns, and covered parity concerns forward-hedged financial returns. They rely on different assumptions and do not provide unconditional short-run exchange-rate forecasts.

C7-MC-1 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-1

In regard to an asset, the _____ is defined as the process well-informed investors must pay for it in a free and competitive market.

(a) analyst value

(b) technical value

(c) competitive value

(d) fundamental value

C7-MC-2 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-2

In corporate finance decision making, an extremely important rule is to choose the investment that _____ current shareholders' wealth.

(a) minimizes

(b) maximizes

(c) provides zero change in

(d) jeopardizes

C7-MC-3 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-3

In asset valuation, the method used to accomplish the estimation depends on the _____.

(a) number of participants

(b) quality of calculating instruments

(c) richness of the information set available

(d) geographic location

C7-MC-4 概念辨析与短计算

⋆ Bodie 2e 配套题库；C7-MC-4

The _____ states that in a competitive market, if two assets are equivalent, they will tend to have the same market price.

(a) Law of Real Interest Rates

(b) Law of One Price

(c) Law of Price Equivalency

(d) Law of Futures

C7-MC-5 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-5

The Law of One Price is enforced by a process called _____, the purchase and immediate sale of equivalent assets in order to earn a sure profit from a difference in their prices.

(a) swapping

(b) maximization

(c) arbitrage

(d) speculation

C7-MC-6 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-6

_____ refers to the totality of costs such as shipping, handling, insuring, and broker fees.

(a) Shipping costs

(b) Transaction costs

(c) Installation costs

(d) Insurance costs

C7-MC-7 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-7

The Law of One price is a statement about the price of one asset _____ the price of another.

(a) absolute to

(b) relative to

(c) multiplied by

(d) independent of

C7-MC-8 概念辨析与短计算

⋆ Bodie 2e 配套题库；C7-MC-8

If an entity borrows at a lower rate and lends at a higher rate, this is an example of _____.

(a) opportunity arbitrage

(b) interest-rate arbitrage

(c) exchange arbitrage

(d) nominal arbitrage

C7-MC-9 概念辨析与短计算

⋆ Bodie 2e 配套题库；C7-MC-9

If arbitrage ensures that any three currencies are freely convertible in competitive markets, then:

(a) it is enough to know only one exchange rate to determine the third

(b) we can estimate two exchange rates based on one exchange rate only

(c) it is enough to know the exchange rates between any two in order to determine the third

(d) it is necessary to know all three rates

C7-MC-10 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-10

Suppose you have $15,000 in a bank account earning an interest rate of 4% per year. At the same time you have an unpaid balance on your credit card of $6,000 on which you are paying an interest rate of 17% per year. What arbitrage opportunity do you face?

(a) $240 per year

(b) $600 per year

(c) $780 per year

(d) $1,020 per year

C7-MC-11 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-11

If the dollar price of Japanese Yen is $0.009594 per Japanese Yen and the dollar price of Chinese Yuan is $0.1433 per Chinese Yuan, what is the Japanese Yen price of a Chinese Yuan? (i.e., JPY/CNY)

(a) 0.001375 JPY/CNY

(b) 0.066950 JPY/CNY

(c) 9.594 JPY/CNY

(d) 14.936419 JPY/CNY

C7-MC-12 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-12

If the dollar price of guilders is $0.5634 per Guilder and the dollar price of Euros is $1.5576 per Euro, what is the Euro price of the Guilder? (i.e., EUR/ANG)

(a) 0.361700 EUR/ANG

(b) 0.877552 EUR/ANG

(c) 2.764643 EUR/ANG

(d) 5.634 EUR/ANG

C7-MC-13 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-13

Suppose the price of gold is 51.09 British pounds per ounce. If the dollar price of gold is $100 per ounce, what would you expect the dollar price of a British pound to be?

(a) $1.95733 per GBP

(b) $1.5109 per GBP

(c) $0.5109 per GBP

(d) $0.4891 per GBP

C7-MC-14 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-14

Quote	MXN/USD	EUR/USD	CAD/USD
Rate	10.398	0.6420	1.0003

What is the EUR/MXN exchange rate?

(a) 0.617426EUR/MXN

(b) 0.641807 EUR/MXN

(c) 6.675516 EUR/MXN

(d) 16.196262 EUR/MXN

C7-MC-15 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-15

Quote	MXN/USD	EUR/USD	CAD/USD
Rate	10.398	0.6420	1.0003

What is the Cdn Dlr/Euro exchange rate? (i.e., CAD/EUR)

(a) 0.641807 CAD/EUR

(b) 1.558099 CAD/EUR

(c) 6.420 CAD/EUR

(d) 16.196262 CAD/EUR

C7-MC-16 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-16

Quote	MXN/USD	EUR/USD	CAD/USD
Rate	10.398	0.6420	1.0003

What is the Euro/Cdn Dlr exchange rate? (i.e., EUR/CAD)

(a) 0.3583 EUR/CAD

(b) 0.641807 EUR/CAD

(c) 1.558099 EUR/CAD

(d) 10.394 EUR/CAD

C7-MC-17 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-17

Quote	MXN/USD	EUR/USD	CAD/USD
Rate	10.398	0.6420	1.0003

What is the Peso/Cdn Dlr exchange rate? (i.e., MXN/CAD)

(a) 0.096201 MXN/CAD

(b) 0.641807 MXN/CAD

(c) 10.394882 MXN/CAD

(d) 16.196262 MXN/CAD

C7-MC-18 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-18

Quote	MXN/USD	EUR/USD	CAD/USD
Rate	10.398	0.6420	1.0003

What is the Peso/Euro exchange rate? (i.e., MXN/EUR)

(a) 0.617426 MXN/EUR

(b) 6.675516 MXN/EUR

(c) 15.581112 MXN/EUR

(d) 16.196262 MXN/EUR

C7-MC-19 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-19

You are travelling in FarOut where you can buy 130 kranes (a krane being the unit of currency of FarOut) with a U.S. dollar at official FarOut banks.

Your tour guide has a relative who dabbles in the black market and this particular relative will sell you kranes for just $0.00833 each on the black market. How much will you lose or gain by exchanging $200 on the black market instead of going to the bank?

(a) you would gain approximately 1,660 kranes

(b) you would lose approximately 1,660 kranes

(c) you would gain approximately 1,990 kranes

(d) you would lose approximately 1,990 kranes

C7-MC-20 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-20

In estimating the value of a share of a firm's stock, a simple model is to :

(a) divide EPS by a P/E multiple

(b) multiply EPS by a P/E multiple

(c) multiply EPS by EAT

(d) divide EPS by market value

C7-MC-21 概念辨析与短计算

⋆ Bodie 2e 配套题库；C7-MC-21

A firm's earnings per share are $6 and the industry average P/E multiple is 9. What would be an estimate of the value of a share of the firm's stock?

(a) $54.00

(b) $45.00

(c) $1.50

(d) $0.67

C7-MC-22 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-22

The value of the asset as it appears in the financial statement is called the asset's _____.

(a) market value

(b) fixed value

(c) book value

(d) expected value

C7-MC-23 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-23

Consider the following stock market reaction to the information contained in a company's announcement. A corporation has just announced that it must pursue the issuance of company equity.

We could expect to see _____ in the price of company stock.

(a) a rise

(b) a drop

(c) a rapid rise

(d) zero change

C7-MC-24 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-24

Consider what the stock market reaction to the following announcement would be. A corporation has just announced that it is engaging in a stock split of the company's shares.

We could expect to see a _____ in the overall market capitalization rate and a _____ in the price of company stock.

(a) rise; drop

(b) drop; rise

(c) rise; drop

(d) rise; drop

C7-MC-25 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-25

The _____ is the proposition that an asset's current price fully reflects all publicly available information about future economic fundamentals affecting the asset's value.

(a) public markets hypothesis

(b) efficient markets exchange rates

(c) fundamental value proposition

(d) efficient markets hypothesis

C7-MC-26 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-26

The market price of an asset reflects the _____ of all analysts' opinions with heavier weights on analysts who control large amounts of money and on those analysts who have better than average information.

(a) best estimate

(b) weighted average

(c) highest estimate

(d) lowest estimate

C7-MC-27 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-27

Assume that the worldwide risk-free real rate of interest is 4% per year. Inflation in Denmark is 9% per year and in the United States it is 7% per year.

Assuming there is no uncertainty about inflation, what are the implied nominal interest rates denominated in Danish krone and in U.S. dollars, respectively?

(a) 16.63% (DKK); 13.50% (USD)

(b) 13.50% (DKK); 16.63% (USD)

(c) 13.36% (DKK); 11.28% (USD)

(d) 11.28% (DKK); 13.36% (USD)

C7-MC-28 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-28

The _____ theory states that the expected real interest rate on risk-free loans is the same all over the world.

(a) nominal interest-rate parity

(b) real interest-rate parity

(c) efficient inflation rate parity

(d) efficient market rate

C7-MC-29 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-29

_____ states that exchange rates adjust so as to maintain the same ″real″ price of a ″representative″ basket of goods and services around the world.

(a) Purchasing power parity

(b) Efficient markets hypothesis

(c) Market valuation model

(d) Exchange rate equity

C7-MC-30 概念辨析与短计算

Bodie 2e 配套题库；C7-MC-30

Assume that the worldwide risk-free real rate of interest is 5% per year. Inflation in Australia is 9% per year and in Great Britain it is 12% per year.

Assuming there is no uncertainty about inflation, what are the implied nominal interest rates denominated in Australian dollars and Great Britain pounds, respectively?

(a) 22.08% (AUD), 11.45% (GBP)

(b) 11.45% (AUD), 22.08% (GBP)

(c) 17.60% (AUD), 14.45% (GBP)

(d) 14.45% (AUD), 17.60% (GBP)

C7-SHORT-1 方法练习

Bodie 2e 配套题库；C7-SHORT-1

Suppose you have $20,000 in a bank account earning an interest rate of 4% per year. At the same time you have an unpaid balance on your credit card of $7,000 on which you are paying an interest rate of 18% per year. What is the arbitrage opportunity you face?

C7-SHORT-2 方法练习

Bodie 2e 配套题库；C7-SHORT-2

Fill in the cross-exchange-rate matrix. Each row is the currency received and each column is the currency surrendered. Use a consistent USD base to avoid reciprocal rounding inconsistencies.

USD price	EUR	DKK	JPY
USD per unit	1.5576	0.2088	0.009594

Received / surrendered	USD	EUR	DKK	JPY
USD	1	?	?	?
EUR	?	1	?	?
DKK	?	?	1	?
JPY	?	?	?	1

C7-SHORT-3 方法练习

Bodie 2e 配套题库；C7-SHORT-3

You observe that the dollar price of the Mexican peso is $0.09618 and the dollar price of the Canadian dollar is $0.9997. What must the exchange rate between the Mexican peso and the Canadian dollar be for there to be no arbitrage opportunity?

C7-SHORT-4 方法练习

Bodie 2e 配套题库；C7-SHORT-4

Suppose that the exchange rate is \$0.2970 to the Israeli shekel. How could you make arbitrage profits with \$10,000 if the dollar price of gold is \$200 per ounce and the shekel price is 750 ILS per ounce?

C7-SHORT-5 方法练习

Bodie 2e 配套题库；C7-SHORT-5

You are travelling in FarOut where you can buy 150 kranes (a krane being the unit of currency in FarOut) with a U.S. dollar at official FarOut banks. Your tour guide has a relative who dabbles in the black market and this particular relative will sell you kranes for just $0.00685 each on the black market. How much would you gain or lose by exchanging $300 on the black market instead of going to the bank?

C7-SHORT-6 方法练习

Bodie 2e 配套题库；C7-SHORT-6

A firm's earnings per share are $5.50 and the industry average P/E multiple is 8. What would be an estimate of the value of a share of the firm's stock? Is it possible for firms being classified in the same industry to have different price/earnings multiples?

C7-SHORT-9 方法练习

Bodie 2e 配套题库；C7-SHORT-9

Assume that the worldwide risk-free real rate of interest is 4% per year. Denmark has an expected rate of inflation of 9% per year and in Spain has an expected rate of inflation of 14% per year. Assuming there is no uncertainty about inflation, what are the implied nominal interest rates denominated in Kroner and Euros?

C7-SHORT-10 方法练习

Bodie 2e 配套题库；C7-SHORT-10

Assume that the worldwide risk-free real rate of interest is 4% per year. The United Kingdom has an expected rate of inflation of 8% per year and in Belgium it is 10% per year. Assuming there is no uncertainty about inflation, what are the implied nominal interest rates denominated in Pounds Sterling and Euros?

C7-LONG-1 综合计算

Bodie 2e 配套题库；C7-LONG-1

Let's assume that you have operated your own business for 18 years. For the most recent fiscal year, sales were $15 million. Net Income for the most recent fiscal year was $1.5 million. The book value of your business was $11 million.

Recently, a firm which is engaged in similar activities to your own was sold and the following information was made public: Multiple of Book Value 0.8x Multiple of Net Income 11x Multiple of Sales 0.7x How would you determine an appropriate range of value for your company?

It has come to your attention that your company has future investment opportunities that would be less profitable than the competing company above. What does this say about the valuation of your company?

C7-LONG-1 Working space

C7-LONG-2 综合计算

Bodie 2e 配套题库；C7-LONG-2

BHM stock is trading for $47 per share on the NYSE and $45 per share on the Sydney Stock Exchange. Assume that the costs of buying and selling BHM stock are negligible. How can you make an arbitrage profit? Over time what would you expect to happen to stock prices in New York and Sydney?

Now assume that the cost of buying and selling shares of BHM are 2% per transaction. How does this affect your answers?

C7-LONG-2 Working space

C7-LONG-3 综合计算

Bodie 2e 配套题库；C7-LONG-3

Suppose you have $50,000 in a bank account earning an interest rate of 3.5% per year. At the same time you have an unpaid balance on your credit card of $13,000 on which you are paying an interest rate of 21% per year. What is the arbitrage opportunity you face?

C7-LONG-3 Working space

C7-LONG-4 综合计算

Bodie 2e 配套题库；C7-LONG-4

The quotes from Hubris Bank and Modesty Bank are given below: Hubris Bank: 106 Yen/$ Modesty Bank: 104 Yen/$ Answer the following questions based on these figures. If we assume no transaction costs, there is evidently an opportunity for arbitrage here.

If an arbitrageur started with $10,000, exactly how would (s)he make profits and how much profit would (s)he make? As many traders engage in arbitrage who do you expect to see in the above quotes at these two banks? If there is a 1% transaction cost for transactions is there still an opportunity for arbitrage?

C7-LONG-4 Working space

C7-LONG-5 综合计算

Bodie 2e 配套题库；C7-LONG-5

In the United States, the real rate of return is expected to be 5% and in Switzerland it is expected to be 4%. If the inflation rate in the United States is expected to be 6% and the Swiss inflation rate is expected to be 8%, what will the nominal interest rates be in the United States and Switzerland? Are these markets in equilibrium?

Where would you prefer to invest and why? What if the Swiss inflation rate were 6%? Are the markets in equilibrium? What are the respective nominal rates if the worldwide risk-free real rate of return is 4% and inflation in the U.S. is 6% and in Switzerland it is 8%?

C7-LONG-5 Working space