Corporate Finance

2018CFA一级培训基础课程

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Topic Structure in CFA Level 1

	Topics	Weights
Ethical and Professional Standards	Ethical and Professional Standards	15%
Investment tools	Quantitative Methods	12%
	Economics	10%
	Financial Reporting and Analysis	20%
	Corporate Finance	7%
Assets Classes- Valuation	Equity Investment	10%
	Fixed Income	10%
	Derivatives	5%
	Alternative Investments	4%
Portfolio Management	Portfolio Management and Wealth Planning	7%

Corporate Finance

- Reading 34 Corporate Governance and ESG: An Introduction
- Reading 35 Capital Budgeting
- Reading 36 Cost of Capital
- Reading 37 Measures of Leverage
- Reading 38 Working Capital Management

Reading 34

Corporate Governance and ESG: An Introduction

Reading 34 Corporate Governance and ESG: An Introduction

- a. describe corporate governance
- b. describe a company's stakeholder groups and compare interests of stakeholder groups
- c. describe principal–agent and other relationships in corporate governance and the conflicts that may arise in these relationships
- d. describe stakeholder management
- e. describe mechanisms to manage stakeholder relationships and mitigate associated risks

Reading 34 Corporate Governance and ESG: An Introduction

- f. describe functions and responsibilities of a company's board of directors and its committees
- g. describe market and non-market factors that can affect stakeholder relationships and corporate governance
- h. identify potential risks of poor corporate governance and stakeholder management and identify benefits from effective corporate governance and stakeholder management
- i. describe factors relevant to the analysis of corporate governance and stakeholder management

Reading 34 Corporate Governance and ESG: An Introduction

- j. describe environmental and social considerations in investment analysis
- k. describe how environmental, social, and governance factors may be used in investment analysis

Los 34.a. describe corporate governance

- Corporate governance is described as “the system of internal controls and procedures by which individual companies are managed. ”
  - defines the rights, roles and responsibilities of various groups .
  - purpose: minimize and manage the conflicting interests between insiders and external shareowners.

CORPORATE GOVERNANCE OVERVIEW

- Shareholder theory:
  - primarily focuses on the interests of the firm's shareholders through maximizing the market value of the firm's common equity.
  - primarily concerns the conflict of interest between the firm's managers and its owners (shareholders).
- Stakeholder theory:
  - broader focus.
  - considers conflicts among the several groups (including shareholders, employees, suppliers, and customers, senior managers, creditors, board of directors).

CORPORATE GOVERNANCE OVERVIEW

- ***Example 1:***
- Which statement regarding corporate governance is most accurate?
  - A. Most countries have similar corporate governance regulations.
  - B. A single definition of corporate governance is widely accepted in practice.
  - C. Both shareholder theory and stakeholder theory consider the needs of a company's shareholders.

Los 34.b: Describe a company's stakeholder groups and compare interests of stakeholder groups

- Shareholders:
  - residual interest in the corporation.
  - voting rights for the election of the board of directors and for other important corporate matters.
  - benefit from the ongoing profitability and growth of the firm.
- Senior managers:
  - compensation made up of a salary, a bonus based on some measure of company performance, and perquisites.
  - interests: continued employment and maximizing the total value of their compensation.

COMPANY STAKEHOLDERS

- Board of directors
  - responsible for protecting the interests of shareholders; hiring, firing, and setting the compensation of the firm's senior managers; setting the strategic direction of the firm; and monitoring financial performance and other aspects of the firm's ongoing activities.
  - one-tier board: members including executives and non-executives.
  - two-tier board:
    - supervisory board: non-executives.
    - management board: company executives.

COMPANY STAKEHOLDERS

- Employees:
  - benefit from the sustainability and success of the firm.
  - interest in their rate of pay, opportunities for career advancement, training, and working conditions.
- Creditors (bondholders and banks):
  - not vote in firm management and not participate in firm growth.
  - receiving interest and principal payments.
  - interests of creditors are protected to varying degrees by covenants in their debt agreements with the firm.

COMPANY STAKEHOLDERS

- Suppliers:
  - interest in preserving an ongoing relationship with the firm, in the profitability of their trade with the firm, and in the growth and ongoing stability of the firm.
  - are typically short-term creditors of the firm, they also have an interest in the firm's solvency and on-going financial strength.
- Customers:
  - interest in ongoing support, product guarantees, and after-sale service.
  - less concerned with, and affected by, a company's financial performance.

COMPANY STAKEHOLDERS

- Governments/Regulators:
  - seek to protect the interests of the general public and ensure the well-being of their nations' economies.
  - regulators have an interest in ensuring that corporations behave in a manner that is consistent with applicable laws.
  - As the collector of tax revenues, a government can also be considered one of the company's major stakeholders.

COMPANY STAKEHOLDERS

- ***Example 2:***
- Which stakeholders would most likely realize the greatest benefit from a significant increase in the market value of the company?
  - A. Creditors
  - B. Customers
  - C. Shareholders

LOS 34.c: Describe principal–agent and other relationships in corporate governance and the conflicts that may arise in these relationships

- Principal-agent conflict arises because an agent is hired to act in the interest of the principal, but an agent's interests may not coincide exactly with those of the principal.

Principal–Agent and Other Relationships in Corporate Governance

- Conflicts of interest between shareholders and managers or directors:
  - managers and directors may choose a lower level of business risk than shareholders would.
  - directors who are also managers favor management interests at the expense of shareholders.
  - when directors favor one group of shareholders at the expense of another (group of shareholders).
  - information asymmetry: shareholders or non-executive directors monitor and evaluate with limit whether managers are acting in the best interests of shareholders.

Principal–Agent and Other Relationships in Corporate Governance

- Conflicts between groups of shareholders:
  - majority shareholders act against the interests of the minority shareholders.
  - when acquisition of the company, controlling shareholders may get better terms for themselves.
  - majority shareholders may cause the company to enter into related-party transactions, agreements or specific transactions that benefit entities in which they have a financial interest, to the detriment of minority shareholders.

Principal–Agent and Other Relationships in Corporate Governance

- Conflicts of interest between creditors and shareholders:
  - shareholders may prefer more business risk than creditors do.
  - equity owners could also act against the interests of creditors by issuing new debt or by paying greater dividends to shareholders.
- Other stakeholders conflicts:
  - Conflict between customers and shareholders: raise prices or reduce product quality in order to increase profits to the detriment of customers.
  - Conflict between customers and suppliers: A company offers overly lenient credit terms to its customers, whereby the company's ability to repay suppliers on time may be affected.
  - Conflict between shareholders and governments or regulators: employ strategies that significantly reduce the taxes they pay to the government.

Principal–Agent and Other Relationships in Corporate Governance

- ***Example 3 :***
- A controlling shareholder of XYZ Company owns 55% of XYZ's shares, and the remaining shares are spread among a large group of shareholders. In this situation, conflicts of interest are most likely to arise between:
  - A. shareholders and regulators.
  - B. the controlling shareholder and managers.
  - C. the controlling shareholder and minority shareholders.

LOS 34.d: Describe stakeholder management

LOS 34.e: Describe mechanisms to manage stakeholder relationships and mitigate associated risks.

- Stakeholder management refers to the management of company relations with stakeholders and is based on having a good understanding of stakeholder interests and maintaining effective communication with stakeholders.

Overview of Stakeholder Management

- The management of stakeholder relationships is based on four types of infrastructures:

  1. The legal infrastructure identifies the laws relevant to and the legal recourse of stakeholders when their rights are violated.

  2. The contractual infrastructure refers to the contracts between the company and its stakeholders that spell out the rights and responsibilities of the company and the stakeholders.

  3. The organizational infrastructure refers to a company's corporate governance procedures, including its internal systems and practices that address how it manages its stakeholder relationships.

  4. Governmental infrastructure comprises the regulations to which companies are subject.

Overview of Stakeholder Management

- ***Example 4 :***
- The component of stakeholder management in which a corporation has the most control is:
  - A. legal infrastructure.
  - B. contractual infrastructure.
  - C. governmental infrastructure.

Mechanisms of Stakeholder Management

- 1.General meetings----required by laws.
  - AGM(annual general meeting):
    - held within a certain period following the end of their fiscal year.
    - purpose: a. present shareholders with the annual audited financial statements of the company; b. provide an overview of the company's performance and activities; c. address shareholder questions.
    - Shareholders: a. elect the directors at the AGM.
      in some countries:
      b. may be required to approve the financial statements.
      c. discharge directors of their duties.
      d. appoint external auditors,.
      e. vote on the remuneration of the board and/or top management.

Mechanism of stakeholders management:

- 1.General meetings----required by laws.
  - EGM(extraordinary general meeting):
    - called by the company or by shareholders throughout the year when significant resolutions requiring shareholder approval are proposed.
    - significant resolutions: relate to proposed material corporate changes.
      - amendments to the company's bylaws or rights attached to a class of shares.
      - mergers and acquisitions or the sale of significant corporate assets or businesses.
  - a simple majority of votes: ordinary resolutions such as approval of financial statements and the election of directors and auditors
  - a supermajority votes: more material decisions such as amendments to bylaws, voting on a merger or takeover transaction, or waiving preemptive rights.

Mechanism of stakeholders management:

- 1.General meetings----required by laws.
  - statunary voting(straight voting): one vote for one share
  - cumulative voting: number of board position elections for one share.
    - raises the likelihood that minority shareholders are represented by at least one director on the board.
  - Minority shareholders are often granted rights to protect their interests in acquisitions.

  - Proxy voting: a process that enables shareholders who are unable to attend a meeting to authorize another individual (for example, another shareholder or director) to vote on their behalf.

Mechanism of stakeholders management:

- ***Example 5 :***
- Which of the statements about extraordinary general meetings (EGMs) of shareholders is true?
  - A. The appointment of external auditors occurs during the EGM.
  - B. A corporation provides an overview of corporate performance at the EGM.
  - C. An amendment to a corporation's bylaws typically occurs during the EGM.

Mechanism of stakeholders management:

- ***Example 6 :***
- Which of the following is not typically used to protect creditors' rights?
  - A. Proxy voting
  - B. Collateral to secure debt obligations
  - C. The imposition of a covenant to limit a company's debt level

Mechanism of stakeholders management:

- 2.Board of director mechanisms:
  - elected and monitored by shareholders through voting power and participation in general meetings.
  - appoints the top management of the company and responsible for the proper governance of the company.
  - guides managers on the company's strategic direction,.
  - oversees and monitors management's actions in implementing the strategy.
  - evaluates and rewards or disciplines management performance.
  - supervises the company's audit, control, and risk management functions.
  - ensures the adoption of proper governance systems and compliance with all applicable laws and regulations.

LOS 34.f: Describe functions and responsibilities of a company's board of directors and its committees.

- Composition of the Board of Directors
  - structure and composition of a board of directors vary.
  - include a diverse mix of expertise, backgrounds, and competencies
  - seek age, gender, and racial diversity in board composition.

BOARD OF DIRECTORS AND COMMITTEES

- Composition of the Board of Directors
  - one-tier structures:
    - excecutive directors and non-executive directors (including independent director)
    - duality or separating CEO and chairperson (lead independent director)
  - two-tier structures:
    - supervisory board: the chairperson is typically external.
    - management board: CEO usually chairs the management board.
  - general practice for boards is that elections occur simultaneously and for specified terms.
  - staggered boards (one type of anti-takeover measure): directors are typically divided into three classes that are elected separately in consecutive years—that is, one class every year.
    - limits their ability to effect a major change of control at the company.

BOARD OF DIRECTORS AND COMMITTEES

- Functions and Responsibilities of the Board
  - The duties of directors are mandated by law.
    - duty of care: requires board members to act on a fully informed basis, in good faith, with due diligence and care.
    - duty of loyalty: the duty of the board member to act in the interest of the company and shareholders. The duty of loyalty should prevent individual board members from acting in their own interest, or the interest of another individual or group, at the expense of the company and all shareholders.
    - Selecting senior management, setting their compensation and bonus structure, evaluating their performance, and replacing them as needed.
    - Setting the strategic direction for the company and making sure that management implements the strategy approved by the board.
    - Approving capital structure changes, significant acquisitions, and large investment expenditures.

BOARD OF DIRECTORS AND COMMITTEES

- Functions and Responsibilities of the Board
  - Reviewing company performance and implementing any necessary corrective steps.
  - Planning for continuity of management and the succession of the CEO and other senior managers.
  - Establishing, monitoring, and overseeing the firm's internal controls and risk management system.
  - Ensuring the quality of the firm's financial reporting and internal audit, as well as oversight of the external auditors.

BOARD OF DIRECTORS AND COMMITTEES

- Board of Directors Committees
  - Audit Committee:
    - Oversight of the financial reporting function and implementation of accounting policies.
    - Effectiveness of the company's internal controls and the internal audit function.
    - Recommending an external auditor and its compensation.
    - Proposing remedies based on their review of internal and external audits.
  - Governance Committee:
    - Oversight of the company's corporate governance code.
    - Implementing the company's code of ethics and policies regarding conflicts of interest.
    - Monitoring changes in relevant laws and regulations.
    - Ensuring that the company is in compliance with all applicable laws and regulations, as well as with the company's governance policies.

BOARD OF DIRECTORS AND COMMITTEES

- Board of Directors Committees
  - Remuneration or Compensation Committee:
    - develops and proposes remuneration policies for the directors and key executives.
    - handls the contracts of managers and directors.
    - sets performance criteria and evaluats the performance of managers.
    - establishes human resources policies.
    - sets and oversees the implementation of employee benefit plans.
  - Nomination Committee:
    - identifies candidates of directors and recommends their nomination for election by shareholders.
    - establishes the nomination procedures and policies
    - director independence.

BOARD OF DIRECTORS AND COMMITTEES

- Board of Directors Committees
  - Risk Committee: required by regulations for financial services firms
    - assists to determine the risk policy, profile, and appetite of the company.
    - oversees establishing enterprise risk management plans and monitors their implementation.
    - supervises the risk management functions, receives regular reports, and reports on its findings and recommendations to the board.
  - Investment Committee:
    - reviews material investment opportunities proposed by management and considers their viability for the company.
    - challenges, when necessary, management assumptions underlying investment prospects.
    - monitors the performance of investments, and reports its findings to the board.
    - establishes and revise the investment strategy and policies of the company.

BOARD OF DIRECTORS AND COMMITTEES

- ***Examples 7 :***
- A primary responsibility of a board's audit committee does not include the:
  - A. proper application of accounting policies.
  - B. adoption of proper corporate governance.
  - C. recommendation of remuneration for the external auditor(s).

LOS 34.g: Describe market and non-market factors that can affect stakeholder relationships and corporate governance.

- Market Factors:
  - Shareholder Engagement
  - Shareholder Activism
  - Competition and Takeovers

LOS 34.g: Describe market and non-market factors that can affect stakeholder relationships and corporate governance.

- Market Factors:
  - Shareholder Engagement
    - traditionally involved in certain events, such as the annual shareholder meeting and analyst calls.
    - the scope of which was limited to financial and strategic matters.
    - trend for greater engagement beyond venues and traditional topics
    - benefits: building support against short-termactivist investors.
      countering negative recommendations from proxy advisory firms.
      receiving greater support for management's position.

FACTORS AFFECTING STAKEHOLDER RELATIONSHIPS AND CORPORATE GOVERNANCE

- Market Factors:
  - Shareholder Activism
    - strategies used by shareholders to attempt to compel a company to act in a desired manner.
    - covering a range of issues.
    - the majority motivation is increasing shareholder value.
    - tactics pressuring management through initiating proxy battles (fights), proposing shareholder resolutions, and publicly raising awareness on issues of contention.
    - additional tactics: such as shareholder derivative lawsuits
    - hedge funds are among the most predominant shareholder activists.

FACTORS AFFECTING STAKEHOLDER RELATIONSHIPS AND CORPORATE GOVERNANCE

- Market Factors:
  - Competition and Takeovers
    - competing through comparing market share or earnings growth.
    - ways of takeovers:
      - proxy contest(proxy fight): seek controlling position on borad of directors.
      - tender offer: pursue to displace managerial team.
      - hostile takeover: acquire a company without consent of management.
    - anti-takeover measures: staggered board or a shareholer rights plan (poison pill)

FACTORS AFFECTING STAKEHOLDER RELATIONSHIPS AND CORPORATE GOVERNANCE

- Market Factors:
- ***Example 8 :***
- Which of the following is true of shareholder activism?
  - A. Shareholder activists rarely include hedge funds.
  - B. Regulators play a prominent role in shareholder activism.
  - C. A primary goal of shareholder activism is to increase shareholder value.

FACTORS AFFECTING STAKEHOLDER RELATIONSHIPS AND CORPORATE GOVERNANCE

- Non-market Factors:
  - legal environment
  - the media
  - the corporate governance industry

FACTORS AFFECTING STAKEHOLDER RELATIONSHIPS AND CORPORATE GOVERNANCE

- Non-market Factors:
  - legal environment
    - common law system are generally considered to offer superior protection of the interests of shareholders and creditors compared with civil law system.
    - Regardless of a country's legal system, creditors are generally more successful in seeking remedies in court to enforce their rights than shareholders are.
  - the media
    - affect corporate governance and influence stakeholder relationships through its ability to spread information quickly and shape public opinion.
    - social media VS traditional media
  - the corporate governance industry
    - demand for external corporate governance services has grown considerably in recent years.

LOS 34.h: Identify potential risks of poor corporate governance and stakeholder management and identify benefits from effective corporate governance and stakeholder management.

- Risks of Poor Governance and Stakeholder Management:
  - Weak Control Systems
  - Ineffective Decision Making
  - Legal, Regulatory, and Reputational Risks
  - Default and Bankruptcy Risks

CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT RISKS AND BENEFITS

- Benefits of Effective Governance and Stakeholder Management
  - Operational Efficiency
  - Improved Control
  - Better Operating and Financial Performance
  - Lower Default Risk and Cost of Debt

CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT RISKS AND BENEFITS

- ***Example 9 :***
- Which of the following is not a benefit of an effective corporate governance structure?
  - A. Operating performance can be improved.
  - B. A corporation's cost of debt can be reduced.
  - C. Corporate decisions and activities require less control.

LOS 34.i: Describe factors relevant to the analysis of corporate governance and stakeholder management.

- Economic Ownership and Voting Control:
  - Generally, one vote for each share. When economic ownership becomes separated from control, investors can face significant potential risks
    - Dual-class structures: common shares may be divided into two classes, one of which has superior voting rights to the other. Dual-class companies tend to trade at a discount to their peers.
    - Another mechanism: one class of stock (held by insiders) elects a majority of the board; outside shareholders who hold a different share class would then be entitled to elect only a minority of the board (Technically, each share carries equal voting rights).

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- Board of Directors Representation:
  - directors' independence, tenure, experience, and diversity
- Remuneration and Company Performance
  - some warning signs:
    - Plans offering little alignment with shareholders
    - Plans exhibiting little variation in results over multiple years
    - Plans with excessive payouts relative to comparable companies with comparable performance.
    - Plans that may have specific strategic implications.
    - Plans based on incentives from an earlier period in the company's life cycle

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- Investors in the Company:
  - cross-shareholdings are still prevalent in a number of markets.
    - generally help to protect management from shareholder pressures.
    - act as takeover defenses.
  - affiliated stockholder (an individual, family trust, endowment, or private equity fund)
    - shield a company from the effects of voting by outside shareholders.
    - act as takeover defenses.
  - activist shareholders can meaningfully and rapidly change the investment thesis for a company.

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- Strength of Shareholders' Rights:

- Managing Long-Term Risks

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- ***Example 10 :***
- 1. Which of the following best describes dual-class share structures?
  - A. Dual-class share structures can be easily changed over time.
  - B. Company insiders can maintain significant power over the organization.
  - C. Conflicts of interest between management and stakeholder groups are less likely than with single share structures.

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- ***Example 10 :***
- 2. An investment analyst would likely be most concerned with an executive remuneration plan that:
  - A. varies each year.
  - B. is consistent with a company's competitors.
  - C. is cash-based only, without an equity component.

ANALYST CONSIDERATIONS IN CORPORATE GOVERNANCE AND STAKEHOLDER MANAGEMENT

- ***Example 10 :***
- 3. Which of the following best describes activist shareholders? Activist shareholders:
  - A. help stabilize a company's strategic direction.
  - B. have little effect on the company's long-term investors.
  - C. can alter the composition of a company's shareholder base.

LOS 34.j: Describe environmental and social considerations in investment analysis

- The practice of considering ESG has evolved more slowly than management and accountability structures and corporate governance.
- sustainable investing (SI) and responsible investing (RI): identify companies that, in an investor's view, efficiently manage their financial, environmental, and human capital resources to generate attractive long-term profitability; that is, the companies are deemed to have "sustainable" business models.
- SI and RI along with ESG investing refer to the consideration of ESG factors in the investment process.

LOS 34.j: Describe environmental and social considerations in investment analysis

- Socially responsible investing (SRI):
  - traditionally referred to the practice of excluding investments in companies or industries, such as weapons and defense, that deviate from an investor's beliefs.
  - evolved to include investment objectives that promote positive social attributes, often by investing in companies with favorable environmental or social profiles.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Factors in Investment Analysis:
- The materiality of ESG factors in investment analysis, particularly environmental and social factors, often differ meaningfully among sectors.
  - general environmental factors: natural resource management, pollution prevention, water conservation, energy efficiency and reduced emissions, the existence of carbon assets, and adherence to environmental safety and regulatory standards.
  - social factors: management of the human capital of a business.
    - human rights and welfare concerns in the workplace.
    - product development.
    - community impact.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Factors in Investment Analysis:
- The materiality of ESG factors in investment analysis, particularly environmental and social factors, often differ meaningfully among sectors.
  - governance factors: ownership structure, board independence and composition, and compensation etc.

LOS 34.j: Describe environmental and social considerations in investment analysis

- ESG Implementation Approaches:
  - negative screening (also referred to as exclusionary screening)
  - positive screening
  - best-in-class
  - ESG integration
  - thematic investing
  - impact investing.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Implementation Approaches:
  - negative screening (also referred to as exclusionary screening):
    - the most commonly applied method.
    - the practice of excluding certain sectors or excluding companies that deviate from accepted standards in some areas.
  - positive screening:
    - focus on investments with favorable ESG aspects.
    - identify companies that successfully manage ESG risks and may benefit from ESG-related opportunities in their sector through an ESG ranking or scoring approach.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Implementation Approaches:
  - best-in-class:
    - focus on investments with favorable ESG aspects.
    - identify companies within each industry that rank (or score) most favorably based on ESG considerations.
    - do not exclude any industries but instead focus on finding the best representation within each sector.
    - typically maintains sector weightings comparable to a relative benchmark index to avoid overweighting or underweighting risk exposures.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Implementation Approaches:
  - ESG integration (or ESG incorporation):
    - the integration of qualitative and quantitative environmental, social, and governance factors into traditional security and industry analysis.
    - identify risks and opportunities arising from ESG factors.
    - determine whether a company is properly managing its environmental, social, and governance resources in accordance with a sustainable business model.
  - Thematic investing:
    - focuses on investing in companies within a specific sector or following a specific theme, such as energy efficiency or climate change.
  - Impact investing:
    - seeks to achieve targeted social or environmental objectives along with measurable financial returns through engagement with a company or by direct investment in projects or companies.

ESG CONSIDERATIONS FOR INVESTORS

- ESG Implementation Approaches:
- ***Example 11 :***
- The ESG implementation method that is most associated with excluding certain sectors or companies is:
  - A. best-in-class.
  - B. thematic investing.
  - C. negative screening.

Reading 35

Capital Budgeting

Reading 35 Capital Budgeting

- a. describe the capital budgeting process and distinguish among the various categories of capital projects.
- b. describe the basic principles of capital budgeting.
- c. explain how the evaluation and selection of capital projects is affected by mutually exclusive projects, project sequencing, and capital rationing.
- d. calculate and interpret net present value (NPV), internal rate of return (IRR), payback period, discounted payback period, and profitability index (PI) of a single capital project.

Reading 35 Capital Budgeting

- e. explain the NPV profile, compare the NPV and IRR methods when evaluating independent and mutually exclusive projects, and describe the problems associated with each of the evaluation methods.
- f. describe expected relations among an investment’ s NPV, company value, and share price.

LOS 35.a: Describe the capital budgeting process and distinguish among the various categories of capital projects.

- The typical steps in the capital budgeting process are as follows:
  - Step One: Generating Ideas:
    - the most important step.
  - Step Two: Analyzing Individual Proposals:
    - gathering the information to forecast cash flows for each project.
    - then evaluating the project's profitability.
  - Step Three: Planning the Capital Budget:
    - organize the profitable proposals into a coordinated whole that fits within the company's overall strategies.
    - also must consider the projects' timing.
  - Step Four: Monitoring and Post-auditing:
    - In a post-audit, actual results are compared to planned or predicted results, and any differences must be explained.

THE CAPITAL BUDGETING PROCESS

- Categories of Capital Budgeting Projects:
  - Replacement projects: easiest capital budgeting decisions.
  - Expansion projects: more carefully considered.
  - New products and services: involves more people in the decision-making process.
  - Regulatory, safety, and environmental projects: may no revenue; not maximize company's own interests.
  - Other projects: escape such analysis (eg. pet projects) or so risky that they are difficult to analyze by the usual methods (such as some research and development decisions).

LOS 35.b: Describe the basic principles of capital budgeting.

- Basic Princples of Capital Budegting:
  - Decisions are based on cash flows.
  - Timing of cash flows is crucial.
  - Cash flows are based on opportunity costs.
  - Cash flows are analyzed on an after-tax basis.
  - Financing costs are ignored.
  - Capital budgeting cash flows are not accounting net income.

BASIC PRINCIPLES OF CAPITAL BUDGETING

- Some important capital budgeting concepts:
  - sunk cost: has already been incurred, should be ignored.
  - opportunity cost: what a resource is worth in its next-best use.
  - incremental cash flow: the cash flow that is realized because of a decision: the cash flow with a decision minus the cash flow without that decision.
  - externality: the effect of an investment on other things besides the investment itself.
    - could be positive or negative, internal or external.
    - should be included in investment decision.
    - Cannibalization is one externality. Cannibalization occurs when an investment takes customers and sales away from another part of the company.

BASIC PRINCIPLES OF CAPITAL BUDGETING

- Some important capital budgeting concepts:
  - Conventional cash flows versus nonconventional cash flows:
    - A conventional cash flow pattern is one with an initial outflow followed by a series of inflows.
    - In a nonconventional cash flow pattern, the initial outflow is not followed by inflows only, but the cash flows can flip from positive to negative again (or even change signs several times).
    - If cash flows change signs once, the pattern is conventional. If cash flows change signs two or more times, the pattern is nonconventional.

LOS 35.c: Explain how the evaluation and selection of capital projects is affected by mutually exclusive projects, project sequencing, and capital rationing.

- Several types of project interactions:
  - Independent projects versus mutually exclusive projects:
    - Independent projects are projects whose cash flows are independent of each other.
    - Mutually exclusive projects compete directly with each other.
  - Project sequencing:
    - Many projects are sequenced through time, so that investing in a project creates the option to invest in future projects.
  - Unlimited funds versus capital rationing:
    - An unlimited funds environment assumes that the company can raise the funds it wants for all profitable projects simply by paying the required rate of return.
    - Capital rationing exists when the company has a fixed amount of funds to invest.

LOS 35.d: Calculate and interpret NPV, IRR, payback period, discounted payback period, and PI of a single capital project.

- Net Present Value (NPV):
  - For a project with one investment outlay, made initially, the net present value (NPV) is the present value of the future after-tax cash flows minus the investment outlay

$$\text{NPV} = \sum_{t=1}^{n} \frac{\text{CF}_t}{(1+r)^t} - \text{Outlay}$$

  - where
  - CF_t = after-tax cash flow at time t
  - r = required rate of return for the investment
  - Outlay = investment cash flow at time zero

INVESTMENT DECISION CRITERIA

- Net Present Value (NPV):
  - Assume that Gerhardt Corporation is considering an investment of €50 million in a capital project that will return after-tax cash flows of €16 million per year for the next four years plus another €20 million in Year 5. The required rate of return is 10 percent.

  - the decision rule for the NPV is as follows:
    - Invest if NPV > 0
    - Do not invest if NPV < 0

INVESTMENT DECISION CRITERIA

- Net Present Value (NPV):
  - Many investments have cash flow patterns in which outflows may occur not only at time zero, but also at future dates.

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n}$$

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+r)^t}$$

INVESTMENT DECISION CRITERIA

- Internal Rate of Return (IRR):
  - one of the most frequently used concepts in capital budgeting and in security analysis.
  - For a project with one investment outlay, made initially, the IRR is the discount rate that makes the present value of the future after-tax cash flows equal that investment outlay.

$$\sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t} = \text{Outlay}$$

$$\sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t} - \text{Outlay} = 0$$

INVESTMENT DECISION CRITERIA

- Internal Rate of Return (IRR):
  - Assume that Gerhardt Corporation is considering an investment of €50 million in a capital project that will return after-tax cash flows of €16 million per year for the next four years plus another €20 million in Year 5. The required rate of return is 10 percent.

  - The decision rule for the IRR is to invest if the IRR exceeds the required rate of return for a project:
    - Invest if IRR > r
    - Do not invest if IRR < r

INVESTMENT DECISION CRITERIA

- Internal Rate of Return (IRR):
  - Many investments have cash flow patterns in which the outlays occur at time zero and at future dates.

$$\sum_{t=0}^{n} \frac{\mathrm{CF}_t}{(1+\mathrm{IRR})^t} = 0$$

INVESTMENT DECISION CRITERIA

- Payback Period:
  - the number of years required to recover the original investment in a project.
  - based on cash flows.

Year	0	1	2	3	4	5
Cash flow	−10,000	2,500	2,500	3,000	3,000	3,000
Cumulative cash flow	−10,000	−7,500	−5,000	−2,000	1,000	4,000

INVESTMENT DECISION CRITERIA

- Payback Period:
  - drawbacks:
    - ignores the time value of money and the risk of the project.
    - ignores cash flows after the payback period is reached.
      - consequence: not a measure of profitability.
  - strength:
    - simplicity.
    - may also be used as an indicator of project liquidity.

  - The payback period has no decision rule.
  - If the payback period is being used (perhaps as a measure of liquidity), analysts should also use an NPV or IRR to ensure that their decisions also reflect the profitability of the projects being considered.

Drawbacks of the Payback Period

The cash flows, payback periods, and NPVs for Projects A through F are given in Table 3. For all of the projects, the required rate of return is 10 percent.

Table 3. Examples of Drawbacks of the Payback Period

	Cash Flows					
Year	Project A	Project B	Project C	Project D	Project E	Project F
0	−1,000	−1,000	−1,000	−1,000	−1,000	−1,000
1	1,000	100	400	500	400	500
2		200	300	500	400	500
3		300	200	500	400	10,000
4		400	100		400	
5		500	500		400	
Payback period	1.0	4.0	4.0	2.0	2.5	2.0
NPV	−90.91	65.26	140.60	243.43	516.31	7,380.92

Comment on why the payback period provides misleading information about the following:

1. Project A.
2. Project B versus Project C.
3. Project D versus Project E.
4. Project D versus Project F.

INVESTMENT DECISION CRITERIA

- Discounted Payback Period:
  - the number of years it takes for the cumulative discounted cash flows from a project to equal the original investment.
    - discounted rate: 10%

Year	0	1	2	3	4	5
Cash flow (CF)	−5,000	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00
Cumulative CF	−5,000	−3,500.00	−2,000.00	−500.00	1,000.00	2,500.00
Discounted CF	−5,000	1,363.64	1,239.67	1,126.97	1,024.52	931.38
Cumulative discounted CF	−5,000	−3,636.36	−2,396.69	−1,269.72	−245.20	686.18

INVESTMENT DECISION CRITERIA

- Discounted Payback Period:
  - If a project has a negative NPV, it will usually not have a discounted payback period.
  - ccount for the time value of money and risk within the discounted payback period.
  - drawbacks:
    - ignores cash flows after the discounted payback period is reached.
      - consequence: 1. is not a good measure of profitability.
        2. another idiosyncrasy of the discounted payback period comes from the possibility of negative cash flows after the discounted payback period is reached.

INVESTMENT DECISION CRITERIA

- Profitability Index(PI):
  - the present value of a project's future cash flows divided by the initial investment.

$$\text{PI} = \frac{\text{PV of future cash flows}}{\text{Initial investment}} = 1 + \frac{\text{NPV}}{\text{Initial investment}}$$

  - Whenever the NPV is positive, the PI will be greater than 1.0.
  - Whenever the NPV is negative, the PI will be less than 1.0.
  - The investment decision rule for the PI is as follows:
    - Invest if PI > 1.0
    - Do not invest if PI < 1.0

INVESTMENT DECISION CRITERIA

- Profitability Index(PI):
  - The Gerhardt Corporation investment (discussed earlier) had an outlay of €50 million, a present value of future cash flows of €63.136 million, and an NPV of €13.136 million. The profitability index is ?

LOS 35.e: Explain the NPV profile, compare the NPV and IRR methods when evaluating independent and mutually exclusive projects, and describe the problems associated with each of the evaluation methods.

- NPV profile:
  - shows a project's NPV graphed as a function of various discount rates.

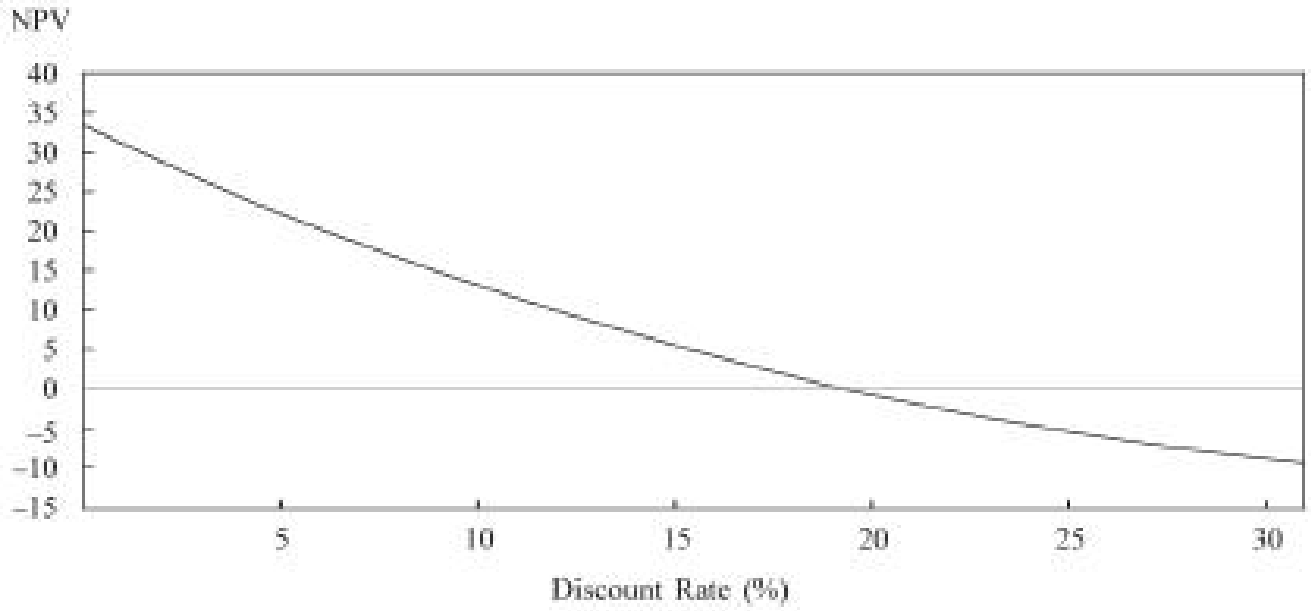
INVESTMENT DECISION CRITERIA

- NPV profile:
  - For the Gerhardt example, we have already calculated several NPVs for different discount rates. At 10 percent the NPV is €13.136 million; at 20 percent the NPV is −€0.543 million; and at 19.52 percent (the IRR), the NPV is zero. What is the NPV if the discount rate is 0 percent? The NPV discounted at 0 percent is €34 million, which is simply the sum of all of the undiscounted cash flows. Table 6 and Figure 1 show the NPV profile for the Gerhardt example for discount rates between 0 percent and 30 percent.

INVESTMENT DECISION CRITERIA

- NPV profile:

Discount Rate (%)	NPV (€ Millions)
0	34.000
5.00	22.406
10.00	13.136
15.00	5.623
19.52	0.000
20.00	–0.543
25.00	–5.661
30.00	–9.954



INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - For a single conventional project, the NPV and IRR will agree on whether to invest or to not invest.
  - For independent, conventional projects, no conflict exists between the decision rules for the NPV and IRR.
  - in the case of two mutually exclusive projects, the two criteria will sometimes disagree.

INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - due to differing cash flow patterns:
    - required rate of return: 10%

	Cash Flows						
Year	0	1	2	3	4	NPV	IRR (%)
Project A	−200	80	80	80	80	53.59	21.86
Project B	−200	0	0	0	400	73.21	18.92

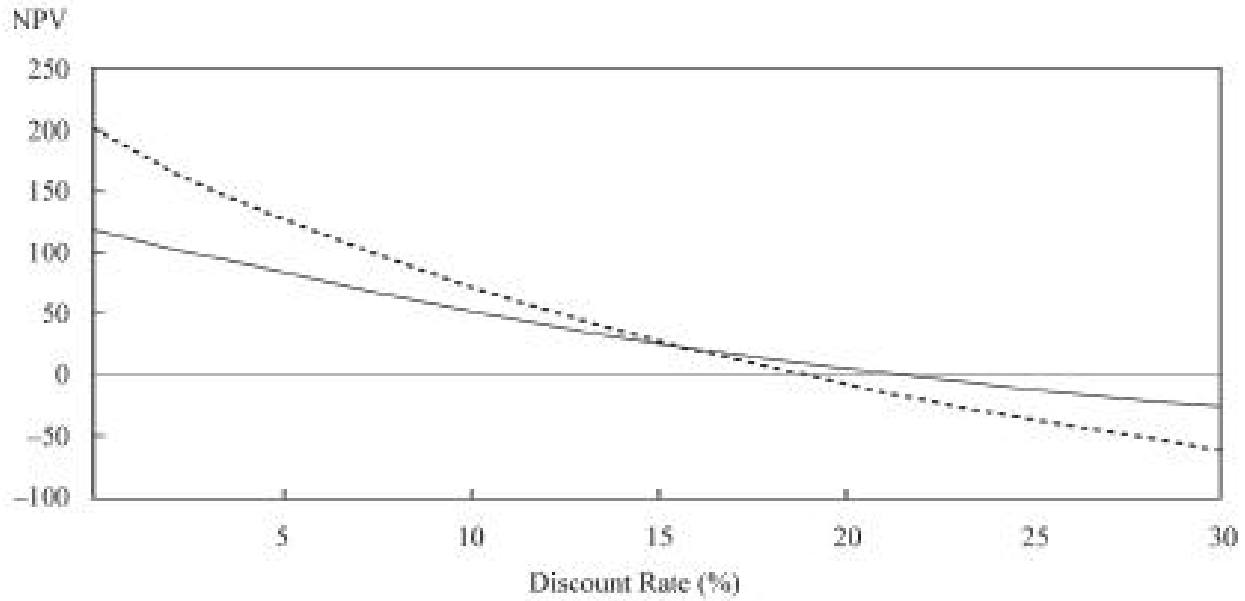
INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - due to differing cash flow patterns:
    - required rate of return: 10%

Discount Rate (%)	NPV for Project A	NPV for Project B
0	120.00	200.00
5.00	83.68	129.08
10.00	53.59	73.21
15.00	28.40	28.70
15.09	27.98	27.98
18.92	11.41	0.00
20.00	7.10	−7.10
21.86	0.00	−18.62
25.00	−11.07	−36.16
30.00	−26.70	−59.95

INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - due to differing cash flow patterns:
  - required rate of return: 10%



LOS 35.e: evaluating mutually exclusive projects

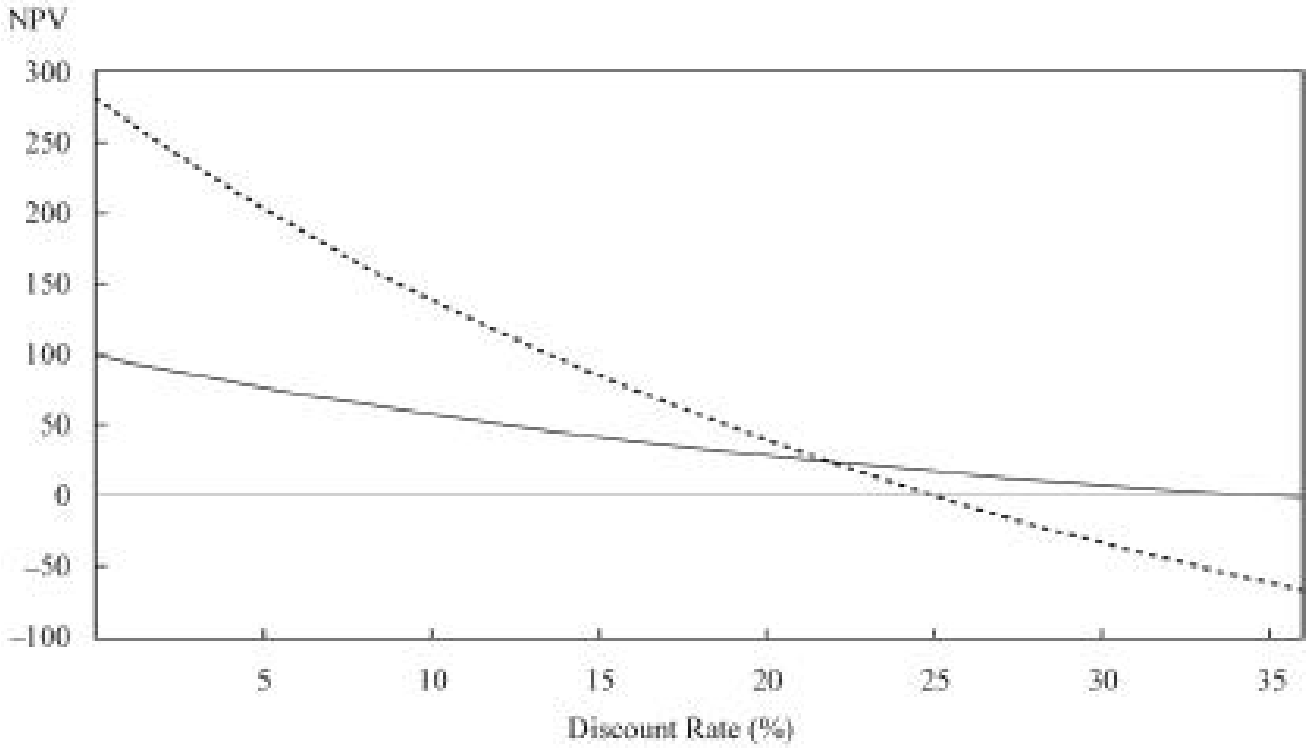
- Ranking Conflicts between NPV and IRR:
  - due to project scale:
    - required rate of return: 10%

	Cash Flows						
Year	0	1	2	3	4	NPV	IRR (%)
Project A	−100	50	50	50	50	58.49	34.90
Project B	−400	170	170	170	170	138.88	25.21

INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - due to project scale:

Discount Rate (%)	NPV for Project A	NPV for Project B
0	100.00	280.00
5.00	77.30	202.81
10.00	58.49	138.88
15.00	42.75	85.35
20.00	29.44	40.08
21.86	25.00	25.00
25.00	18.08	1.47
25.21	17.65	0.00
30.00	8.31	−31.74
34.90	0.00	−60.00
35.00	−0.15	−60.52



INVESTMENT DECISION CRITERIA

- Ranking Conflicts between NPV and IRR:
  - the NPV and IRR criteria will usually indicate the same investment decision for a given project.
  - When the choice is between two mutually exclusive projects and the NPV and IRR rank the two projects differently, the NPV criterion is strongly preferred.

INVESTMENT DECISION CRITERIA

- The Relative Advantages and Disadvantages of the NPV and IRR Methods:
  - NPV:
    - key advantage: a direct measure of the expected increase in the value of the firm.
    - main weakness: does not include any consideration of the size of the project.
  - IRR:
    - key advantage: measures profitability as a percentage, showing the return on each dollar invested.
    - main weakness: (1)the possibility of producing rankings of mutually exclusive projects different from those from NPV analysis.
      (2)possibility that a project has multiple IRRs or no IRR.

INVESTMENT DECISION CRITERIA

- The Multiple IRR Problem and the No IRR Problem:
  - For conventional projects that have outlays followed by inflows—negative cash flows followed by positive cash flows—the multiple IRR (>0) problem cannot occur.
  - For nonconventional projects, the multiple IRR problem and no IRR problem might occur, .
  - Analysts should always be aware of the unusual cash flow patterns.

INVESTMENT DECISION CRITERIA

- The Multiple IRR Problem and the No IRR Problem:

1.

Time	0	1	2
Cash flow	−1,000	5,000	−6,000

2.

Time	0	1	2
Cash flow	100	−300	250

INVESTMENT DECISION CRITERIA

	United States	United Kingdom	Netherlands	Germany	France
Internal rate of return[a]	3.09	2.31	2.36	2.15	2.27
Net present value[a]	3.08	2.32	2.76	2.26	1.86
Payback period[a]	2.53	2.77	2.53	2.29	2.46
Hurdle rate	2.13	1.35	1.98	1.61	0.73
Sensitivity analysis	2.31	2.21	1.84	1.65	0.79
Earnings multiple approach	1.89	1.81	1.61	1.25	1.70
Discounted payback period[a]	1.56	1.49	1.25	1.59	0.87
Real options approach	1.47	1.65	1.49	2.24	2.20
Accounting rate of return[a]	1.34	1.79	1.40	1.63	1.11
Value at risk	0.95	0.85	0.51	1.45	1.68
Adjusted present value	0.85	0.78	0.78	0.71	1.11
Profitability index[a]	0.85	1.00	0.78	1.04	1.64

- Popularity and Usage of the Capital Budgeting Methods:
  - In the four European countries, the payback period is used as often as, or even slightly more often than, the NPV and IRR.
  - Larger companies tended to prefer the NPV and IRR over the payback period.
  - Private corporations used the payback period more frequently than did public corporations.

INVESTMENT DECISION CRITERIA

	United States	United Kingdom	Netherlands	Germany	France
Internal rate of return[a]	3.09	2.31	2.36	2.15	2.27
Net present value[a]	3.08	2.32	2.76	2.26	1.86
Payback period[a]	2.53	2.77	2.53	2.29	2.46
Hurdle rate	2.13	1.35	1.98	1.61	0.73
Sensitivity analysis	2.31	2.21	1.84	1.65	0.79
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Adjusted present value	0.85	0.78	0.78	0.71	1.11
Profitability index[a]	0.85	1.00	0.78	1.04	1.64

- Popularity and Usage of the Capital Budgeting Methods:
  - Companies managed by an MBA had a stronger preference for the discounted cash flow techniques.

INVESTMENT DECISION CRITERIA

- NPVs and Stock Prices:
  - The NPV criterion is the criterion most directly related to stock prices.
  - In theory, if a corporation invests in positive NPV projects, these should add to the wealth of its shareholders.
  - In reality, the effect of a capital budgeting project's positive or negative NPV on share price is more complicated.
    - depend on whether the investment's profitability is more or less than expected.
    - news of a particular capital project might be considered as a signal about other capital projects underway or in the future.

INVESTMENT DECISION CRITERIA

- NPVs and Stock Prices:
  - Freitag Corporation is investing €600 million in distribution facilities. The present value of the future after-tax cash flows is estimated to be €850 million. Freitag has 200 million outstanding shares with a current market price of €32.00 per share. This investment is new information, and it is independent of other expectations about the company. What should be the effect of the project on the value of the company and the stock price?

Reading 36

Cost of Capital

Reading 36 Cost of Capital

- a. calculate and interpret the weighted average cost of capital (WACC) of a company.
- b. describe how taxes affect the cost of capital from different capital sources.
- c. describe the use of target capital structure in estimating WACC and how target capital structure weights may be determined.
- d. explain how the marginal cost of capital and the investment opportunity schedule are used to determine the optimal capital budget.

Reading 36 Cost of Capital

- e. explain the marginal cost of capital’ s role in determining the net present value of a project.
- f. calculate and interpret the cost of debt capital using the yield-to-maturity approach and the debt-rating approach.
- g. calculate and interpret the cost of noncallable, nonconvertible preferred stock.
- h. calculate and interpret the cost of equity capital using the capital asset pricing model approach, the dividend discount model approach, and the bond-yield-plus risk-premium approach.

Reading 36 Cost of Capital

- i. calculate and interpret the beta and cost of capital for a project.
- j. describe uses of country risk premiums in estimating the cost of equity.
- k. describe the marginal cost of capital schedule, explain why it may be upward-sloping with respect to additional capital, and calculate and interpret its break-points.
- l. explain and demonstrate the correct treatment of flotation costs.

LOS 36.a: Calculate and interpret the weighted average cost of capital (WACC) of a company.

LOS 36.b: Describe how taxes affect the cost of capital from different capital sources.

- cost of capital:
  - the rate of return that the suppliers of capital—bondholders and owners—require as compensation for their contribution of capital.
  - the opportunity cost of funds for the suppliers of capital.

Cost of Capital

- component cost of capital:
  - each cost (required rate of return) of alternatives (equity, debt, instruments sharing features of equity and debt) for rasing capital
- marginal cost:
  - what it would cost to raise additional funds for the potential investment project.
  - the cost of capital that the investment analyst is concerned with.

Cost of Capital: WACC

- WACC (weighted average cost of capital):
  - the cost of capital for the entire company.
  - the required rate of return that investors demand for the average-risk investment of a company.
  - the cost that a company incurs for additional capital (the marginal cost of capital (MCC))

Cost of Capital: WACC

- WACC (weighted average cost of capital):

$$\text{WACC} = w_d r_d(1-t) + w_p r_p + w_e r_e$$

- where
  - w_d = the proportion of debt that the company uses when it raises new funds
  - r_d = the before-tax marginal cost of debt
  - t = the company's marginal tax rate
  - w_p = the proportion of preferred stock the company uses when it raises new funds
  - r_p = the marginal cost of preferred stock
  - w_e = the proportion of equity that the company uses when it raises new funds
  - r_e = the marginal cost of equity

Cost of Capital: WACC

- Assume that ABC Corporation has the following capital structure: 30 percent debt, 10 percent preferred stock, and 60 percent equity. ABC Corporation wishes to maintain these proportions as it raises new funds. Its before-tax cost of debt is 8 percent, its cost of preferred stock is 10 percent, and its cost of equity is 15 percent. If the company's marginal tax rate is 40 percent, what is ABC's weighted average cost of capital?

Taxes and the Cost of Capital

- Taking the tax-deductibility of interest as the base case, we adjust the pre-tax cost of debt for this tax shield. Multiplying r_d by (1 − t) results in an estimate of the after-tax cost of debt.
- There is no need to make any adjustment in the cost of equity for taxes because the payments to owners, whether in the form of dividends or the return on capital, are not tax-deductible for the company.

Taxes and the Cost of Capital

- Jorge Ricard, a financial analyst, is estimating the costs of capital for the Zeale Corporation. In the process of this estimation, Ricard has estimated the before-tax costs of capital for Zeale's debt and equity as 4 percent and 6 percent, respectively. What are the after-tax costs of debt and equity if Zeale's marginal tax rate is:
  - 1. 30 percent?
  - 2. 48 percent?

LOS 36.c: Describe the use of target capital structure in estimating WACC and how target capital structure weights may be determined.

- 1. target capital structure is the capital structure that a company is striving to obtain. If we know, we should use it.
- 2.company's current capital structure, at market value weights for the components.
- 3.Examine trends in the company's capital structure or statements by management regarding capital structure policy to infer the target capital structure.
- 4.Use averages of comparable companies' capital structures.(just unweighted, arithmetic average; if weighted ,will give more weight to larger companies.)

Weights of the Weighted Average

- Fin Anziell is a financial analyst with Analytiker Firma. Anziell is in the process of estimating the cost of capital of Gewicht GmbH. The following information is provided:
  - Gewicht GmbH
  - Market value of debt €50 million
  - Market value of equity €60 million
- Primary competitors and their capital structures (in millions):

Competitor	Market Value of Debt	Market Value of Equity
A	€25	€50
B	€101	€190
C	£40	£60

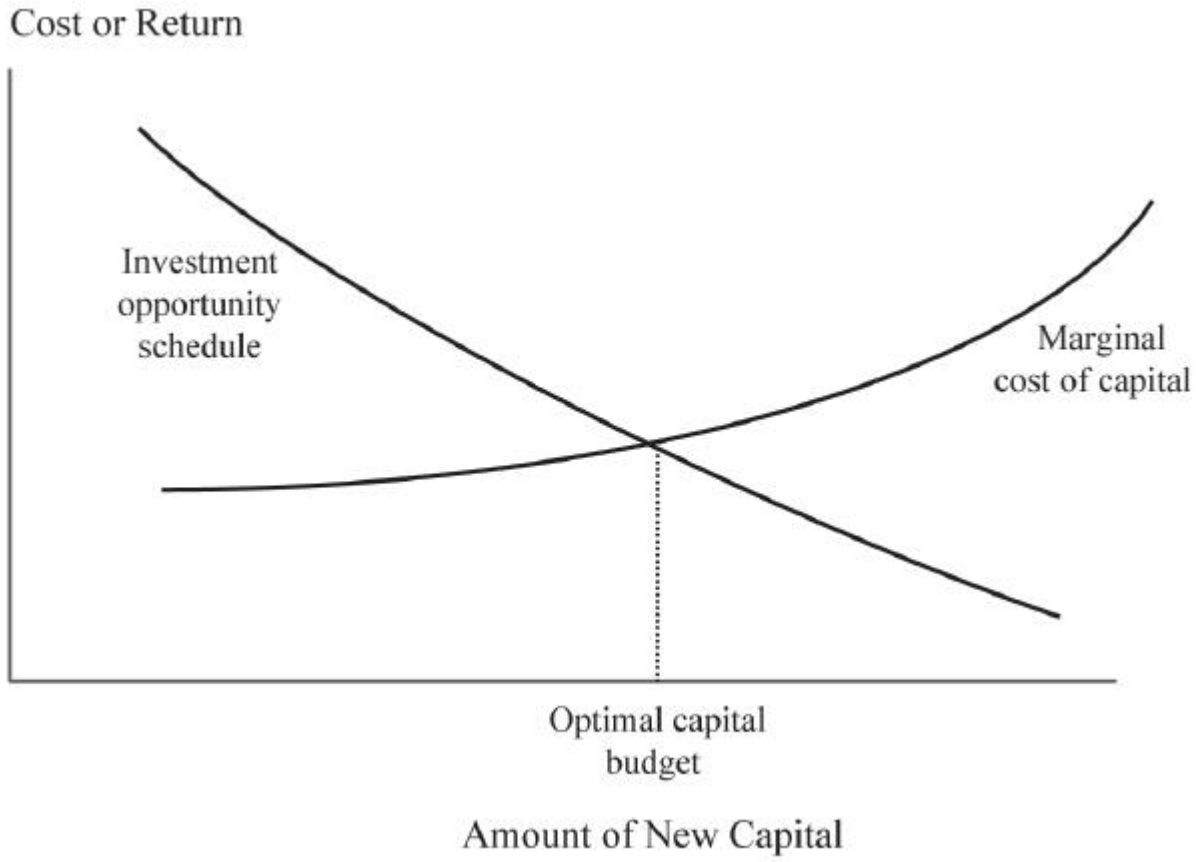
- What are Gewicht's proportions of debt and equity that Anziell would use if estimating these proportions using the company's:
- 1. current capital structure? 2. competitors' capital structure? 3. Suppose Gewicht announces that a debt-to-equity ratio of 0.7 reflects its target capital structure. What weights should Anziell use in the cost of capital calculations?

LOS 36.d: Explain how the marginal cost of capital and the investment opportunity schedule are used to determine the optimal capital budget.

- A company's marginal cost of capital (MCC) may increase as additional capital is raised.
- Returns to a company's investment opportunities are generally believed to decrease as the company makes additional investments, as represented by the investment opportunity schedule (IOS).

Optimal Investment Decision

- The optimal capital budget is that amount of capital raised and invested at which the marginal cost of capital is equal to the marginal return from investing.



LOS 36.e: Explain the marginal cost of capital's role in determining the net present value of a project.

- If we choose to use the company's WACC in the calculation of the NPV of a project, we are assuming that the project:
  - 1.has the same risk as the average-risk project of the company.
  - 2.will have a constant target capital structure throughout its useful life.
- What if these assumptions don't hold?
  - To evaluate a project with greater than (the firm's) average risk, a discount rate greater than the firm's existing WACC should be used. Projects with below-average risk should be evaluated using a discount rate less than the firm's WACC.
  - Sometimes you are required by the question that you should use the project's capital structure.

Applying the Cost of Capital to Capital Budgeting and Security Valuation

- For a particular valuation model,
  - If these cash flows are cash flows to the company's suppliers of capital (that is, free cash flow to the firm(FCFF)), the analyst uses the weighted average cost of capital of the company in the valuation.
  - If these cash flows are strictly those belonging to the company's owners, such as the free cash flow to equity (FCFE), or dividends, the analyst uses the cost of equity capital to find the present value of these flows.

LOS 36.f: Calculate and interpret the cost of debt capital using the yield-tomaturity approach and the debt-rating approach.

LOS 36.g: Calculate and interpret the cost of noncallable, nonconvertible preferred stock.

LOS 36.h: Calculate and interpret the cost of equity capital using the capital asset pricing model approach, the dividend discount model approach, and the bondyield- plus risk-premium approach.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- COSTS OF Debt:
  - Yield-to-Maturity Approach
  - Debt-Rating Approach

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Costs of Debt:
  - Yield-to-Maturity Approach
    - The yield to maturity (YTM) is the annual return that an investor earns on a bond if the investor purchases the bond today and holds it until maturity.

$$P_0 = \frac{PMT_1}{\left(1+\frac{r_d}{2}\right)} + \ldots + \frac{PMT_n}{\left(1+\frac{r_d}{2}\right)^n} + \frac{FV}{\left(1+\frac{r_d}{2}\right)^n} = \left(\sum_{t=1}^{n} \frac{PMT_t}{\left(1+\frac{r_d}{2}\right)^t}\right) + \frac{FV}{\left(1+\frac{r_d}{2}\right)^n}$$

    - where
      - P_0 = the current market price of the bond
      - PMT_t = the interest payment in period t
      - r_d = the yield to maturity
      - n = the number of periods remaining to maturity
      - FV = the maturity value of the bond

- This valuation equation assumes the bond pays semi-annual interest and that any intermediate cash flows (in this case the interest prior to maturity) are reinvested at the rate $r_d/2$.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Costs of Debt:
  - Yield-to-Maturity Approach
    - Valence Industries issues a bond to finance a new project. It offers a 10-year, $1,000 face value, 5 percent semi-annual coupon bond. Upon issue, the bond sells at $1,025. What is Valence's before-tax cost of debt? If Valence's marginal tax rate is 35 percent, what is Valence's after-tax cost of debt?

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Costs of Debt:
  - Debt-Rating Approach
    - When a reliable current market price for a company's debt is not available, the debt-rating approach can be used to estimate the before-tax cost of debt.
    - Based on a company's debt rating, we estimate the before-tax cost of debt by using the yield on comparably rated bonds for maturities that closely match that of the company's existing debt.
    - Debt ratings are ratings of the debt issue itself, with the issuer being only one of the considerations.
    - Other factors, such as debt seniority and security, also affect ratings and yields.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Costs of Debt:
  - Debt-Rating Approach
    - Suppose a company's capital structure includes debt with an average maturity (or duration) of 10 years and the company's marginal tax rate is 35 percent. If the company's rating is AAA and the yield on debt with the same debt rating and similar maturity (or duration) is 4 percent, the company's after-tax cost of debt is?

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Issues in Estimating the Cost of Debt:
  - Fixed-Rate Debt versus Floating-Rate Debt:
    - Estimating the cost of a floating-rate security is difficult because the cost of this form of capital over the long term depends not only on the current yields but also on the future yields.
    - The analyst may use the current term structure of interest rates and term structure theory to assign an average cost to such instruments.
  - Debt with Optionlike Features:
    - If the company already has debt outstanding incorporating optionlike features that the analyst believes are representative of the future debt issuance of the company, the analyst may simply use the yield to maturity on such debt in estimating the cost of debt.
    - If the analyst believes that the company will add or remove option features in future debt issuance, the analyst can make market value adjustments to the current YTM to reflect the value of such additions and/or deletions.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Issues in Estimating the Cost of Debt:
  - Nonrated Debt:
    - If a company does not have any debt outstanding or if the yields on the company's existing debt are not available, the analyst may not always be able to use the yield on similarly rated debt securities. It may be the case that the company does not have rated bonds.
  - Leases:
    - If company uses leasing as a source of capital, the cost of these leases should be included in the cost of capital.
    - The cost of this form of borrowing is similar to that of the company's other long-term borrowing.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Preferred Stock:
  - The cost of preferred stock is the cost that a company has committed to pay preferred stockholders as a preferred dividend when it issues preferred stock.
  - In the case of nonconvertible, noncallable preferred stock that has a fixed dividend rate and no maturity date (fixed rate perpetual preferred stock), we can use the formula for the value of a preferred stock:

$$P_p = \frac{D_p}{r_p}$$

  - where
    - P_p = the current preferred stock price per share
    - D_p = the preferred stock dividend per share
    - r_P = the cost of preferred stock

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Preferred Stock:

$$r_p = \frac{D_p}{P_p}$$

  - Unlike interest on debt, the dividend on preferred stock is not tax-deductible by the company; therefore, there is no adjustment to the cost for taxes.
  - A preferred stock may have a number of features that affect the yield and hence the cost of preferred stock.
    - call option, cumulative dividends, participating dividends, adjustable-rate dividends, or convertibility into common stock.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Preferred Stock:
  - Alcoa has one class of preferred stock outstanding, a $3.75 cumulative preferred stock, for which there are 546,024 shares outstanding. If the price of this stock is $72, what is the estimate of Alcoa's cost of preferred equity?

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Preferred Stock:
  - Wim Vanistendael is finance director of De Gouden Tulip N.V., a leading Dutch flower producer and distributor. He has been asked by the CEO to calculate the cost of preferred equity and has recently obtained the following information:
    - The issue price of preferred stock was €3.5 million and the preferred dividend is 5 percent.
    - If the company issued new preferred stock today, the preferred coupon rate would be 6.5 percent.
    - The company's marginal tax rate is 30.5 percent.
  - What is the cost of preferred equity for De Gouden Tulip N.V.?

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - the capital asset pricing model
  - the dividend discount model
  - the bond yield plus risk premium method

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Capital Asset Pricing Model Approach
    - the expected return on a stock, $E(R_i)$, is the sum of the risk-free rate of interest, R_F, and a premium for bearing the stock's market risk, $\beta_i(R_M - R_F)$

$$E(R_i) = R_F + \beta_i [E(R_M) - R_F]$$

    - where
      - β_i = the return sensitivity of stock i to changes in the market return
      - $E(R_M)$ = the expected return on the market
      - $E(R_M) - R_F$ = the expected market risk premium
    - the risk-free rate is the yield on a default-free government debt instrument.
    - the selection of the appropriate risk-free rate should be guided by the duration of projected cash flows.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Capital Asset Pricing Model Approach
    - Valence Industries wants to know its cost of equity. Its CFO believes the risk-free rate is 5 percent, equity risk premium is 7 percent, and Valence's equity beta is 1.5. What is Valence's cost of equity using the CAPM approach?

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Capital Asset Pricing Model Approach
    - multifactor model:

$$E(R_i) = R_F + \beta_{i1}(\text{Factor risk premium})_1 + \beta_{i2}(\text{Factor risk premium})_2 + \ldots + \beta_{ij}(\text{Factor risk premium})_j$$

    - where
      - β_{ij} = stock i's sensitivity to changes in the *j*th factor
      - $(\text{Factor risk premium})_j$ = expected risk premium for the *j*th factor

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Capital Asset Pricing Model Approach
    - Suppose that the arithmetic average T-bond rate observed over the last 100 years is an unbiased estimator for the risk-free rate and amounts to 5.4 percent. Likewise, suppose the arithmetic average of return on the market observed over the last 100 years is an unbiased estimator for the expected return for the market. The average rate of return of the market was 9.3 percent. Calculate the equity risk premium.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Dividend Discount Model Approach

$$V_0 = \sum_{t=1}^{\infty} \left(\frac{D_t}{(1+r_e)^t} \right) = \frac{D_1}{(1+r_e)} + \frac{D_2}{(1+r_e)^2} + \cdots$$

    - where
      - V_0 = the intrinsic value of a share
      - D_t = the share's dividend at the end of period t
      - r_e = the cost of equity

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Dividend Discount Model Approach
    - Based on Gordon's constant growth formulation, we assume dividends are expected to grow at a constant rate, g.
    - If we assume that price reflects intrinsic value (V0 = P0):

$$P_0 = \frac{D_1}{r_e - g}$$

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Dividend Discount Model Approach
    - two ways to estimate the growth rate:
      - 1. use a forecasted growth rate from a published source or vendor.
      - 2. use a relationship between the growth rate, the retention rate, and the return on equity. (sustainable growth rate)
        - g = (1 – D/EPS)×ROE
          = (1 – Dividend Payout Ratio) × ROE
          = Retention Ratio × ROE
  - January 2006, Citigroup had a forward annual dividend yield of 3.9 percent, a trailing return on equity of approximately 20 percent, but an estimated average return on equity going forward of approximately 16.6 percent.

COSTS OF THE DIFFERENT SOURCES OF CAPITAL

- Cost of Common Equity:
  - Bond Yield plus Risk Premium Approach
    - based on the fundamental tenet in financial theory that the cost of capital of riskier cash flows is higher than that of less risky cash flows.

$$r_e = r_d + \text{Risk premium}$$

    - In developed country markets, a typical risk premium added is in the range of 3 to 5 percent.
- Citigroup, as of early January 2006, the yield to maturity of the Citigroup 5.3s bonds maturing in 2016 was approximately 4.95 percent. Adding an arbitrary risk premium of 3.5 percent produces an estimate of the cost of equity is ?

TOPICS IN COST OF CAPITAL ESTIMATION

- 1. Estimating Beta and Determining a Project Beta
- 2. Country Risk
- 3. Marginal Cost of Capital Schedule
- 4. Flotation Costs
- 5. What Do CFOs Do?

LOS 36.i: Calculate and interpret the beta and cost of capital for a project.

- 1. Estimating Beta and Determining a Project Beta
  - market model regression
  - pure-play method

1.Estimating Beta and Determining a Project Beta

- market model regression
- pure-play method

1.Estimating Beta and Determining a Project Beta

- market model regression (for publicly traded companies)

$$R_{it} = \hat{a} + \hat{b}R_{mt} \quad t = 1,2,\ldots T$$

- Consider some of the issues:
  - Estimation period:
    - longer estimation periods are applied to companies with a long and stable operating history.
    - shorter estimation periods are used for companies that have undergone significant structural changes in the recent past (such as restructuring, recent acquisition, or divestiture) or changes in financial and operating leverage.
  - Periodicity of the return interval:
    - smaller standard error in beta estimated using smaller return intervals, such as daily returns.

1.Estimating Beta and Determining a Project Beta

- market model regression (for publicly traded companies)

$$R_{it} = \hat{a} + \hat{b}R_{mt} \quad t = 1,2,\ldots T$$

- Consider some of the issues:
  - Selection of an appropriate market index.
  - Use of a smoothing technique.
    - Some analysts adjust historical betas to reflect the tendency of betas to revert to 1.
  - Adjustments for small-capitalization stocks.
    - Small-capitalization stocks have generally exhibited greater risks and greater returns than large-capitalization stocks over the long run.
    - Betas for small-capitalization companies be adjusted upward.

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - using a comparable publicly traded company (similar business risk)'s beta and adjusting it for financial leverage differences.
  - (business risk of a company or project is the risk related to the uncertainty of revenues, referred to as sales risk, and to operating risk, which is the risk attributed to the company's operating cost structure.
    Financial risk is the uncertainty of net income and net cash flows attributed to the use of financing that has a fixed cost, such as debt and leases.)
- *implication: companies in same line of business have same business risk.*
- *equity beta reflects both business risk and financial risk, same with the firm beta and project beta.*
- *asset beta reflects business risk only.*

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)

$$\beta_{\text{asset}} = \beta_{\text{debt}} \frac{(1-t)\,D}{(1-t)\,D+E} + \beta_{\text{equity}} \frac{E}{(1-t)\,D+E}$$

  - where
    - E = market value of equity
    - D = market value of debt
    - w_d = proportion of debt = D/(D + E)
    - w_e = proportion of equity = E/(D + E)
    - t = the marginal tax rate

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - generally assume that a company's debt does not have market risk, so $\beta_{debt} = 0$.

$$\beta_{\text{asset}} = \beta_{\text{equity}} \left[\frac{1}{1 + \left((1 - t) \frac{D}{E} \right)} \right]$$

$$\beta_{\text{equity}} = \beta_{\text{asset}} \left[1 + \left((1 - t) \frac{D}{E} \right) \right]$$

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - To estimate the asset risk and equity risk for a project:
    - using the project's capital structure and marginal tax rate.

Estimating a Beta Using the Pure-Play Method

Step 1: Select the comparable Determine comparable company or companies. These are companies with similar business risk.

↓

Step 2: Estimate comparable's beta Estimate the equity beta of the comparable company or companies.

↓

Step 3: Unlever the comparable's beta Unlever the beta of the comparable company or companies, removing the financial risk component of the equity beta, leaving the business risk component of the beta.

↓

Step 4: Lever the beta for the project's financial risk Lever the beta of the project by adjusting the asset beta for the financial risk of the project.

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - To estimate the asset risk and equity risk for a project:

$$\beta_{\mathrm{U,comparable}} = \frac{\beta_{\mathrm{L,comparable}}}{\left[1 + \left((1 - t_{\mathrm{comparable}})\,\frac{\mathrm{D_{comparable}}}{\mathrm{E_{comparable}}}\right)\right]}$$

$$\beta_{\mathrm{L,project}} = \beta_{\mathrm{U,comparable}}\left[1 + \left((1 - t_{\mathrm{project}})\,\frac{\mathrm{D_{project}}}{\mathrm{E_{project}}}\right)\right]$$

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - Suppose that the beta of a publicly traded company’ s stock is 1.3 and that the market value of equity and debt are, respectively, C$540 million and C$720 million. If the marginal tax rate of this company is 40 percent, what is the asset beta of this company?

1.Estimating Beta and Determining a Project Beta

- pure-play method (for non-publicly traded companies or projects not average or typical for a publicly traded company)
  - Raymond Cordier is the business development manager of Aerotechnique S.A., a private Belgian subcontractor of aerospace parts. Although Aerotechnique is not listed on the Belgian stock exchange, Cordier needs to evaluate the levered beta for the company. He has access to the following information:
    - The average levered and average unlevered betas for the group of comparable companies operating in different European countries are 1.6 and 1.0, respectively.
    - Aerotechnique’ s debt-to-equity ratio, based on market values, is 1.4.
    - Aerotechnique’ s corporate tax rate is 34 percent.

Estimating the Weighted Average Cost of Capital

- Georg Schrempp is the CFO of Bayern Chemicals KgaA, a large German manufacturer of industrial, commercial, and consumer chemical products. Bayern Chemicals is privately owned, and its shares are not listed on an exchange. The CFO has appointed Markus Meier, CFA, of Crystal Clear Valuation Advisors, a third-party valuator, to perform a stand-alone valuation of Bayern Chemicals. Meier had access to the following information to calculate Bayern Chemicals' weighted average cost of capital:
  - The nominal risk-free rate is represented by the yield on the long-term 10-year German bund, which at the valuation date was 4.5 percent.
  - The average long-term historical equity risk premium in Germany is assumed at 5.7 percent.
  - Bayern Chemicals' corporate tax rate is 38 percent.
  - Bayern Chemicals' target debt-to-equity ratio is 0.7. Bayern is operating at its target debt-to-equity ratio.
  - Bayern Chemicals' cost of debt has an estimated spread of 225 basis points over the 10-year bond.
  - Table 2 supplies additional information on comparables for Bayern Chemicals.

Estimating the Weighted Average Cost of Capital

Table 2. Information on Comparables

Comparable Companies	Country	Tax Rate (%)	Market Capitalization in Millions	Net Debt in Millions	D/E	Beta
British Chemicals Ltd.	United Kingdom	30.0	4,500	6,000	1.33	1.45
Compagnie Petrochimique S.A.	France	30.3	9,300	8,700	0.94	0.75
Rotterdam Chemie N.V.	Netherlands	30.5	7,000	7,900	1.13	1.05
Average					1.13	1.08

- Based only on the information given, calculate Bayern Chemicals' WACC.

LOS 36.j: Describe uses of country risk premiums in estimating the cost of equity.

- 2.Country Risk
  - The use of a stock's beta to capture the country risks of a project is well supported in empirical studies that examine developed nations.
  - Beta does not appear to adequately capture country risk for companies in developing nations.
  - A common approach for dealing with this problem is to adjust the cost of equity estimated using the CAPM by adding a country spread (country risk premium) to the market risk premium.

2.Country Risk

$$\text{Country equity premium} = \text{Sovereign yield spread} \left[\frac{\text{Annualized standard deviation of equity index}}{\text{Annualized standard deviation of the sovereign bond market in terms of the developed market currency}} \right]$$

- Miles Avenaugh, an analyst with the Global Company, is estimating a country risk premium to include in his estimate of the cost of equity capital for Global’ s investment in Argentina. Avenaugh has researched yields in Argentina and observed that the Argentinean government’ s 10-year bond is 9.5 percent. A similar maturity US Treasury bond has a yield of 4.5 percent. The annualized standard deviation of the Argentina Merval stock index, a market value index of stocks listed on the Buenos Aires Stock Exchange, during the most recent year is 40 percent. The annualized standard deviation of the Argentina dollar-denominated 10-year government bond over the recent period was 28 percent.
- What is the estimated country risk premium for Argentina based on Avenaugh’ s research?

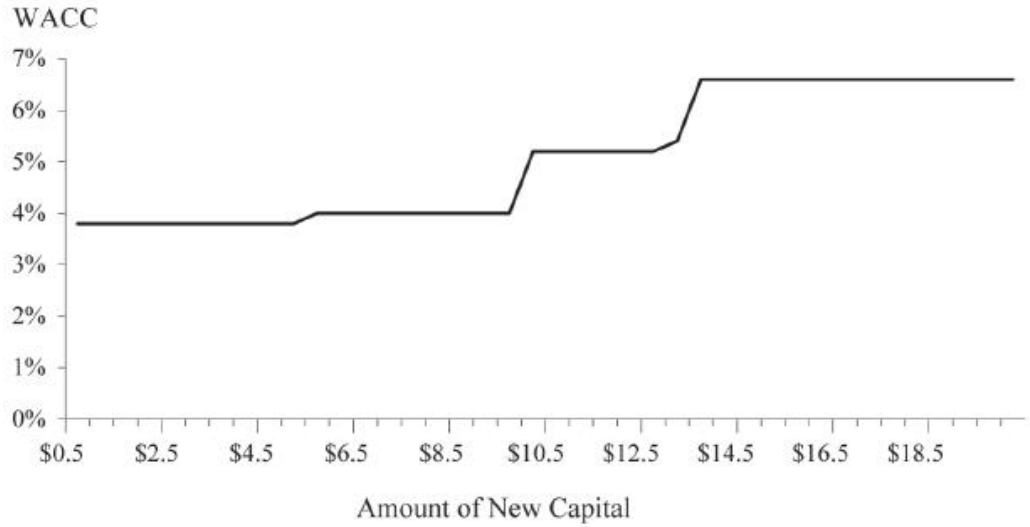
LOS 36.k: Describe the marginal cost of capital schedule, explain why it may be upward-sloping with respect to additional capital, and calculate and interpret its break-points.

- 3.Marginal Cost of Capital Schedule
  - as a company raises more funds, the costs of the different sources of capital may change, resulting in a change in the weighted average cost of capital for different levels of financing. The result is the marginal cost of capital (MCC) schedule.
  - The amount of capital at which the weighted average cost of capital changes—which means that the cost of one of the sources of capital changes—is referred to as a break point.

3.Marginal Cost of Capital Schedule

Amount of New Debt (in Millions)	After-Tax Cost of Debt	Amount of New Equity (in Millions)	Cost of Equity
new debt ≤ €2	2.0 percent	new equity ≤ €6	5.0 percent
€2 < new debt ≤ €5	2.5 percent	€6 < new equity ≤ €8	7.0 percent
€5 < new debt	3.0 percent	€8 < new equity	9.0 percent

- If the company raises capital according to its target capital structure proportions of 40 percent debt and 60 percent equity, this company faces a marginal cost of capital schedule that is upward sloping, with break points at €5 million, €10 million, €12.5 million, and €13.3 million.



3.Marginal Cost of Capital Schedule

- Alan Conlon is the CFO of Allied Canadian Breweries Ltd. He wants to determine the capital structure that will result in the lowest cost of capital for Allied. He has access to the following information:
  - The minimum rate at which the company can borrow is the 12-month Libor rate plus a premium that varies with the debt-to-capital ratio [D/(D + E)] as given inTable 4.

Table 4. Spreads over Libor for Alternative Debt-to-Capital Ratios

$\frac{D}{D+E}$	Spread (bps)
Less than 0.40	200
0.40 to 0.49	300
0.50 to 0.59	400
0.60 to 0.69	600
0.70 to 0.79	800
0.80 to 0.89	1,000
0.90 or higher	1,200

3.Marginal Cost of Capital Schedule

- The current 12-month Libor is 4.5 percent.
- The market risk premium is 4 percent, and unleveraged beta is 0.9.
- The risk-free rate is 4.25 percent.
- The company's tax rate is 36 percent.

1. Determine the WACC for 10 percent intervals of the debt-to-capital ratio (i.e., 0.1, 0.2, etc.) based on the information given in Table 4.

2. Recommend a target capital structure based on 10 percent intervals of the debt-tocapital ratio, recommend a target capital structure.

3.Marginal Cost of Capital Schedule

Table 5 WACC for Alternative Capital Structures

$\frac{D}{D+E}$	β	r_d (Percent)	r_e (Percent)	WACC (Percent)
0.1	0.96	6.5	8.1	7.7
0.2	1.04	6.5	8.4	7.6
0.3	1.15	6.5	8.8	7.4
0.4	1.28	7.5	9.4	7.6
0.5	1.48	8.5	10.2	7.8
0.6	1.76	10.5	11.3	8.6
0.7	2.24	12.5	13.2	9.6
0.8	3.20	14.5	17.1	10.8
0.9	6.08	16.5	28.6	12.4

LOS 36.I: Explain and demonstrate the correct treatment of flotation costs.

- When a company raises new capital, it generally seeks the assistance of investment bankers. Investment bankers charge the company a fee based on the size and type of offering. This fee is referred to as the flotation cost.
- In the case of debt and preferred stock, we do not usually incorporate flotation costs in the estimated cost of capital because the amount of these costs is quite small, often less than 1 percent.
- with equity issuance, the flotation costs may be substantial, so we should consider these when estimating the cost of external equity capital.

4.Flotation Costs

- How to deal with flotation cost?
  - 1. incorporate the flotation costs into the cost of capital. (incorrect)
  - 2. incorporated into any valuation analysis as an additional cost of the project.

4.Flotation Costs

- How to deal with flotation cost?
  - 1. incorporate the flotation costs into the cost of capital. (incorrect)

$$r_e = \left(\frac{D_1}{P_0 - F}\right) + g$$

    - F: flotation costs in monetary terms on a per share basis

$$r_e = \left(\frac{D_1}{P_0(1-f)}\right) + g$$

    - f: the flotation cost as a percentage of the issue price

4.Flotation Costs

- How to deal with flotation cost?
  - 2. incorporated into any valuation analysis as an additional cost of the project.
  - Consider a project that requires a €60,000 initial cash outlay and is expected to produce cash flows of €10,000 each year for 10 years. Suppose the company's marginal tax rate is 40 percent and that the before-tax cost of debt is 5 percent. Furthermore, suppose that the company's dividend next period is €1, the current price of the stock is €20, and the expected growth rate is 5 percent. Assume the company will finance the project with 40 percent debt and 60 percent equity. If the flotation costs are 5 percent of the new equity capital and not tax-deductible. Find the NPV of the project.

5.What Do CFOs Do?

- The most popular method for estimating the cost of equity is the capital asset pricing model.
- Few companies use the dividend cash flow model to estimate a cost of equity.
- Publicly traded companies are more likely to use the capital asset pricing model than are private companies.
- In evaluating projects, the majority use a single company cost of capital, but a large portion apply some type of risk adjustment for individual projects.

Reading 37

Measures of Leverage

Reading 37 Measures of Leverage

- a. define and explain leverage, business risk, sales risk, operating risk, and financial risk and classify a risk.
- b. calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage.
- c. analyze the effect of financial leverage on a company's net income and return on equity.
- d. calculate the breakeven quantity of sales and determine the company's net income at various sales levels.
- e. calculate and interpret the operating breakeven quantity of sales.

LOS 37.a: Define and explain leverage, business risk, sales risk, operating risk, and financial risk and classify a risk.

- Leverage is the use of fixed costs in a company's cost structure.
  - Fixed costs that are operating costs (such as depreciation) create operating leverage.
  - Fixed costs that are financial costs (such as interest expense) create financial leverage.
  - Leverage can magnify earnings both up and down.
  - The greater a company's leverage, the greater its risk and, hence, the greater the discount rate that should be applied in its valuation.

Introduction

- Leverage is the use of fixed costs in a company's cost structure.

	Impulse Robotics	Malvey Aerospace
Revenues	$1,000,000	$1,000,000
Operating costs	700,000	750,000
Operating income	$300,000	$250,000
Financing expense	100,000	50,000
Net income	$200,000	$200,000

  - Are they identical in terms of operating and financial characteristics? Would we appraise these two companies at the same value?

Introduction

- Leverage is the use of fixed costs in a company's cost structure.
  - The risk associated with future earnings and cash flows of a company are affected by the company's cost structure.
    - cost structure of a company is the mix of variable and fixed costs.
      - Variable costs fluctuate with the level of production and sales.
        - the cost of goods purchased for resale, costs of materials or supplies, shipping charges, delivery charges, wages for hourly employees, sales commissions, and sales or production bonuses.
      - Fixed costs are expenses that are the same regardless of the production and sales of the company.
        - depreciation, rent, interest on debt, insurance, and wages for salaried employees.

Introduction

- Leverage is the use of fixed costs in a company's cost structure.

	Impulse Robotics	Malvey Aerospace
Number of units produced and sold	100,000	100,000
Sales price per unit	$10	$10
Variable cost per unit	$2	$6
Fixed operating cost	$500,000	$150,000
Fixed financing expense	$100,000	$50,000

- What if the number of units produced and sold is 500000?

- What if the number of units produced and sold is 80000?

Introduction

- Leverage is the use of fixed costs in a company's cost structure.
  - Companies that have more fixed costs relative to variable costs in their cost structures have greater variation in net income as revenues fluctuate and, hence, more risk.

BUSINESS RISK AND FINANCIAL RISK

- Business Risk and Its Components:
  - Business risk is the risk associated with operating earnings.
    - sales risk: the uncertainty with respect to the price and quantity of goods and services.
      - Even with same cost structure, sale risks can be different because of differing distributions of units sold and price per unit.
    - Operating risk is the risk attributed to the operating cost structure, in particular the use of fixed costs in operations.
  - Companies that operate in the same line of business generally have similar business risk.

LOS 37.b: Calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage.

- Business Risk and Its Components:
  - Operating risk's measure:
    - DOL(degree of operating leverage): operating income elasticity (measure how sensitive operating income is to changes in demand, as measured by unit sales).

$$\text{DOL} = \frac{\text{Percentage change in operating income}}{\text{Percentage change in units sold}}$$

  - operating income=Q(P-VC) - TFC
  - P-VC: per unit contribution margin (the amount that each unit sold contributes to covering fixed costs)
  - Q(P-VC): contribution margin

LOS 37.b: Calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage.

- Business Risk and Its Components:
  - Operating risk's measure:
    - DOL(degree of operating leverage): operating income elasticity (measure how sensitive operating income is to changes in demand, as measured by unit sales).

$$\text{DOL} = \frac{\text{Q(P–V)}}{\text{Q(P–V)–F}}$$

where:

Q=quantity of units sold

P=price per unit

V=variable cost per unit

F=Fixed costs

LOS 37.b: Calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage.

- Business Risk and Its Components:
  - Operating risk's measure:
    - DOL(degree of operating leverage): operating income elasticity (measure how sensitive operating income is to changes in demand, as measured by unit sales).

$$\text{DOL} = \frac{\text{S}-\text{TVC}}{\text{S}-\text{TVC}-\text{F}}$$

where:

S=sales

TVC=total variable costs

F=fixed costs

BUSINESS RISK AND FINANCIAL RISK

- Business Risk and Its Components:
  - Operating risk's measure:
    - DOL is different at different numbers of units produced and sold.
    - change % of operating income = change % of unit sales × DOL
    - The greater the slope(operate income - unit sales) is , the higher the operating risk is.

- Arnaud Kenigswald is analyzing the potential impact of an improving economy on earnings at Global Auto, one of the world's largest car manufacturers. Global is headquartered in Berlin. Two Global Auto divisions manufacture passenger cars and produce combined revenues of €93 billion. Kenigswald projects that sales will improve by 10 percent due to increased demand for cars. He wants to see how Global's earnings might respond given that level of increase in sales. He first looks at the degree of leverage at Global, starting with operating leverage.
  Global sold 6 million passenger cars in 2009. The average price per car was €24,000, fixed costs associated with passenger car production total €15 billion per year, and variable costs per car are €14,000. What is the degree of operating leverage of Global Auto?

BUSINESS RISK AND FINANCIAL RISK

- Financial Risk:
  - the risk associated with how a company finances its operations.
  - The more fixed-cost financial obligations (e.g., debt, lease, preferred equity) incurred by the company, the greater its financial risk.
  - Issuing equity does not influence financial risk.

BUSINESS RISK AND FINANCIAL RISK

- Financial Risk:
  - measure of financial risk:
    - DFL (degree of financial leverage): the sensitivity of the cash flows available to owners (net income) when operating income changes.

$$\text{DFL} = \frac{\text{Percentage change in net income}}{\text{Percentage change in operating income}}$$

    - DFL is different for different operating income.

	Operating Income of $300,000	Operating Income of $360,000	Percentage Change
Operating income	$300,000	$360,000	+20
Less interest	100,000	100,000	0
Net income	$200,000	$260,000	+30

    - How does net income change if operating income changes?

BUSINESS RISK AND FINANCIAL RISK

- Financial Risk:
  - measure of financial risk:

	Operating Income of $300,000	Operating Income of $360,000	Percentage Change
Operating income	$300,000	$360,000	+20
Less interest	150,000	150,000	0
Net income	$150,000	$210,000	+40

  - How does net income change what if fixed fiancial fees changed?

BUSINESS RISK AND FINANCIAL RISK

- Financial Risk:
  - measure of financial risk:

$$\mathrm{DFL} = \frac{[Q(P-V)-F](1-t)}{[Q(P-V)-F-C](1-t)} = \frac{[Q(P-V)-F]}{[Q(P-V)-F-C]}$$

$$\mathrm{DFL} = \frac{\mathrm{EBIT}}{\mathrm{EBIT-interest}}$$

  - DFL is not affected by the tax rate.

  - Global Auto also employs debt financing. If Global can borrow at 8 percent, the interest cost is €40 billion. What is the degree of financial leverage of Global Auto if 6 million cars are produced and sold?

LOS 37.c: Analyze the effect of financial leverage on a company's net income and return on equity.

- the degree of financial leverage is most often a choice by the company's management.
- operating costs are very similar among companies in the same industry.
- companies with relatively high ratios of tangible assets to total assets may be able to use higher degrees of financial leverage.
- businesses whose revenues have below-average business cycle sensitivity may be able to use more financial leverage .
- Using financial leverage generally increases the variability of return on equity (net income divided by shareholders' equity).
- using financial leverage by a profitable company may increase the level of return on equity.

BUSINESS RISK AND FINANCIAL RISK

- Total Leverage:
  - DTL: combining a company's degree of operating leverage with its degree of financial leverage.
  - the sensitivity of net income to changes in the number of units produced and sold.

$$\text{DTL} = \frac{\text{Percentage change in net income}}{\text{Percentage change in the number of units sold}}$$

$$\text{DTL} = \frac{Q(P-V)}{Q(P-V)-F} \times \frac{[Q(P-V)-F]}{[Q(P-V)-F-C]}$$

$$\text{DOL} \qquad \times \qquad \text{DFL}$$

$$= \frac{Q(P-V)}{Q(P-V)-F-C}$$

$$\text{DTL} = \frac{\text{S}-\text{TVC}}{\text{S}-\text{TVC}-\text{F}-\text{I}}$$

  - DTL is different depending on the number of units produced and sold

LOS 37.d: Calculate the breakeven quantity of sales and determine the company's net income at various sales levels.

LOS 37.e: Calculate and interpret the operating breakeven quantity of sales.

- Breakeven Points and Operating Breakeven Points
  - breakeven point, Q_{BE}, is the number of units produced and sold at which the company's net income is zero—the point at which revenues are equal to costs.

$$PQ_{BE} = VQ_{BE} + F + C$$

$$Q_{BE} = \frac{F + C}{P - V}$$

  - higher leverage, greater breakeven point.
  - The further a firm's sales are from its breakeven level of sales, the greater the magnifying effects of leverage on net income.

Breakeven Points and Operating Breakeven Points

- operating breakeven point, Q_{OBE}, is the number of units produced and sold at which the company's operation income is zero—the point at which revenues are equal to operation costs.

$$PQ_{\mathrm{OBE}} = VQ_{\mathrm{OBE}} + F$$

$$Q_{\mathrm{OBE}} = \frac{F}{P-V}$$

- higher leverage, greater operating breakeven point.
- The further a firm's sales are from its operating breakeven level of sales, the greater the magnifying effects of leverage on operating income.

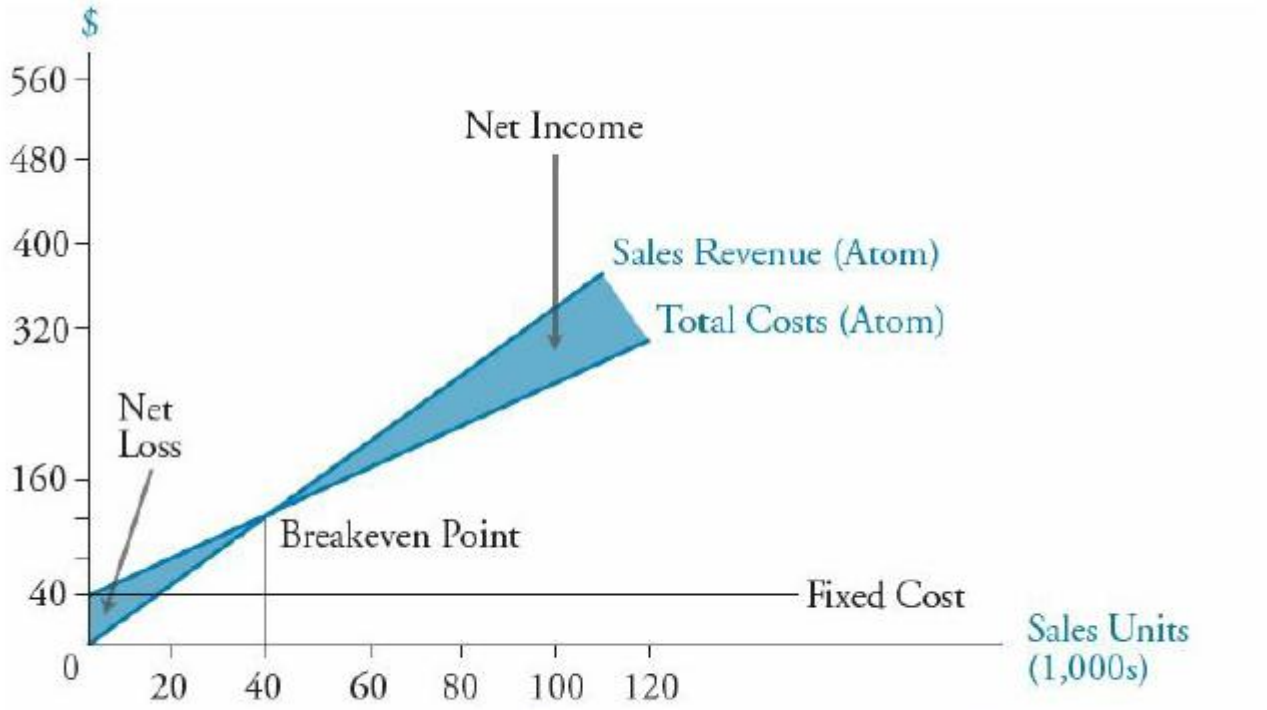
Breakeven Points and Operating Breakeven Points

- Consider the prices and costs for Atom Company and Beta Company shown in the following table. Compute and illustrate the breakeven quantity of sales for each company.

	Atom Company	Beta Company
Price	$4.00	$4.00
Variable costs	$3.00	$2.00
Fixed operating costs	$10,000	$80,000
Fixed financing costs	$30,000	$40,000

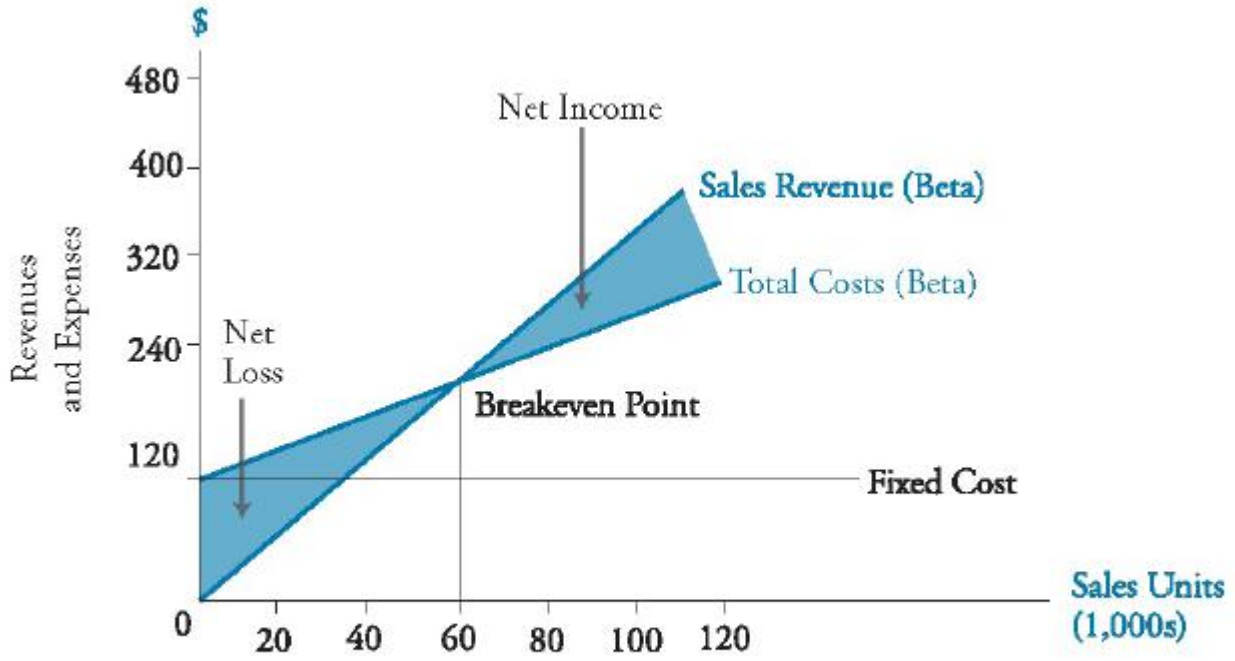
Breakeven Points and Operating Breakeven Points

- Figure 1: Breakeven Analysis for Atom Company



Breakeven Points and Operating Breakeven Points

- Figure 2: Breakeven Analysis for Beta Company



For Beta Company: Q_{BE} = ($80,000 + $40,000) / ($4.00 – $2.00) = 60,000 units

Breakeven Points and Operating Breakeven Points

- Calculate the operating breakeven quantity of sales for Atom and Beta, using the same data from the previous example.

	Atom Company	Beta Company
Price	$4.00	$4.00
Variable costs	$3.00	$2.00
Fixed operating costs	$10,000	$80,000
Fixed financing costs	$30,000	$40,000

The Risks of Creditors and Owners

- The risk for providers of equity and debt capital differs because of the relative rights and responsibilities associated with the use of borrowed money in a business.
  - generally, creditors take less risk than owners do.

- Bankruptcy:
  - One form provides for a temporary protection from creditors so that a viable business may reorganize (negotiated reorganization in U.S.).
  - For businesses that are not viable, the second form of bankruptcy process allows for the orderly satisfaction of the creditors' claims (liquidation in U.S.).

The Risks of Creditors and Owners

- The difference between a company that reorganizes and emerges from bankruptcy and one that is liquidated is often the difference between operating and financial leverage.
  - Companies with high operating leverage have less flexibility in making changes, and bankruptcy protection does little to help reduce operating costs.
  - Companies with high financial leverage use bankruptcy laws and protection to change their capital structure and, once the restructuring is complete, can emerge as ongoing concerns.

Reading 38

Working Capital Management

Reading 38 Working Capital Management

- a. describe primary and secondary sources of liquidity and factors that influence a company's liquidity position.
- b. compare a company's liquidity measures with those of peer companies.
- c. evaluate working capital effectiveness of a company based on its operating and cash conversion cycles and compare the company's effectiveness with that of peer companies.
- d. describe how different types of cash flows affect a company's net daily cash position.

Reading 38 Working Capital Management

- e. calculate and interpret comparable yields on various securities, compare portfolio returns against a standard benchmark, and evaluate a company's short-term investment policy guidelines.
- f. evaluate a company's management of accounts receivable, inventory, and accounts payable over time and compared to peer companies.
- g. evaluate the choices of short-term funding available to a company and recommend a financing method.

Introduction

- working capital management:
  - focuses on short-term aspects of corporate finance activities.
  - purpose: ensure that a company has adequate ready access to the funds necessary for day-to-day operating expenses, while at the same time making sure that the company's assets are invested in the most productive way.
    - Insufficient access to cash could ultimately lead to severe restructuring of a company by selling off assets, reorganization via bankruptcy proceedings, or final liquidation of the company.
    - excessive investment in cash and liquid assets may not be the best use of company resources.

LOS 38.a: Describe primary and secondary sources of liquidity and factors that influence a company's liquidity position.

- Defining Liquidity Management:
  - Liquidity management refers to the ability of an organization to generate cash when and where it is needed.
  - Liquidity refers to the resources available for an entity to tap into cash balances and to convert other assets or extend other liabilities into cash for use in keeping the entity solvent (i.e., being able to pay bills and continue in operation).

Defining Liquidity Management

- Key sources of liquidity:
  - Primary Sources of Liquidity
  - Secondary Sources of Liquidity

Defining Liquidity Management

- Key sources of liquidity:
  - Primary Sources of Liquidity
    - Ready cash balances:
      - cash available in bank accounts, resulting from payment collections, investment income, liquidation of near-cash securities (i.e., those with maturities of less than 90 days), and other cash flows.
    - Short-term funds:
      - trade credit, bank lines of credit, and short-term investment portfolios
    - Cash flow management:
      - effectiveness in its cash management system and practices
      - the degree of decentralization of the collections or payments processes

Defining Liquidity Management

- Key sources of liquidity:
  - Secondary Sources of Liquidity
    - The main difference between the primary and secondary sources of liquidity is that using a primary source is not likely to affect the normal operations of the company, whereas using a secondary source may result in a change in the company's financial and operating positions.
    - inlude:
      - negotiating debt contracts
      - liquidating assets
      - filing for bankruptcy protection and reorganization

Defining Liquidity Management

- Cash flow transactions have significant effects on a company's liquidity position.
  - drag on liquidity is when receipts lag, creating pressure from the decreased available funds.
  - pull on liquidity is when disbursements are paid too quickly or trade credit availability is limited, requiring companies to expend funds before they receive funds from sales that could cover the liability.

Defining Liquidity Management

- Major drags on receipts:
  - Uncollected receivables: indicated by large number of days of receivables and high levels of bad debt expenses.
  - Obsolete inventory: indicated by slow inventory turnover ratios.
  - Tight credit
- Major pulls on payments:
  - Making payments early
  - Reduced credit limits
  - Limits on short-term lines of credit
  - Low liquidity positions

LOS 38.b: Compare a company's liquidity measures with those of peer companies.

- Measuring liquidity:
  - Liquidity contributes to a company's credit-worthiness.
    - Credit-worthiness is the perceived ability of the borrower to pay what is owed on the borrowing in a timely manner and represents the ability of a company to withstand adverse impacts on its cash flows.
      - lower borrowing costs
      - better terms for trade credit
      - impoving investment flexibility to capture profitable opportunities.

Measuring Liquidity

- Liquidity ratios: measure a company's ability to meet short-term obligations to creditors as they mature or come due.
  - current ratio:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

  - quick ratio (acid-test ratio):
    - quick asset: assets that can be most readily converted to cash (current assets without inventory).

$$\text{Quick ratio} = \frac{\text{Cash} + \text{Short-term marketable investments} + \text{Receivables}}{\text{Current liabilities}}$$

  - The greater the current ratio or the quick ratio (that is, the greater the potential ability to cover current liabilities), the higher a company's liquidity.

Measuring Liquidity

- Ratios measuring asset management:
  - turnover ratios:
    - account receivable turnover:

$$\text{Accounts receivable turnover} = \frac{\text{Credit sales}}{\text{Average receivables}}$$

    - inventory turnover:

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

  - number of days of CA or CL on hand:
    - number of days of receivables:

$$\text{Number of days of receivables} = \frac{\text{Accounts receivable}}{\text{Average day's sales on credit}}$$

$$= \frac{\text{Accounts receivable}}{\text{Sales on credit}/365}$$

Measuring Liquidity

- Ratios measuring asset management:
  - number of days of CA or CL on hand:
    - number of days of inventory (average inventory period, day's sales in ending inventory, the inventory holding period):

$$\text{Number of days of inventory} = \frac{\text{Inventory}}{\text{Average day's cost of goods sold}}$$

$$= \frac{\text{Inventory}}{\text{Cost of goods sold}/365}$$

    - number of days of payables (day's payables outstanding, the average days payable):

$$\text{Number of days of payables} = \frac{\text{Accounts payable}}{\text{Average day's purchases}} = \frac{\text{Accounts payable}}{\text{Purchases}/365}$$

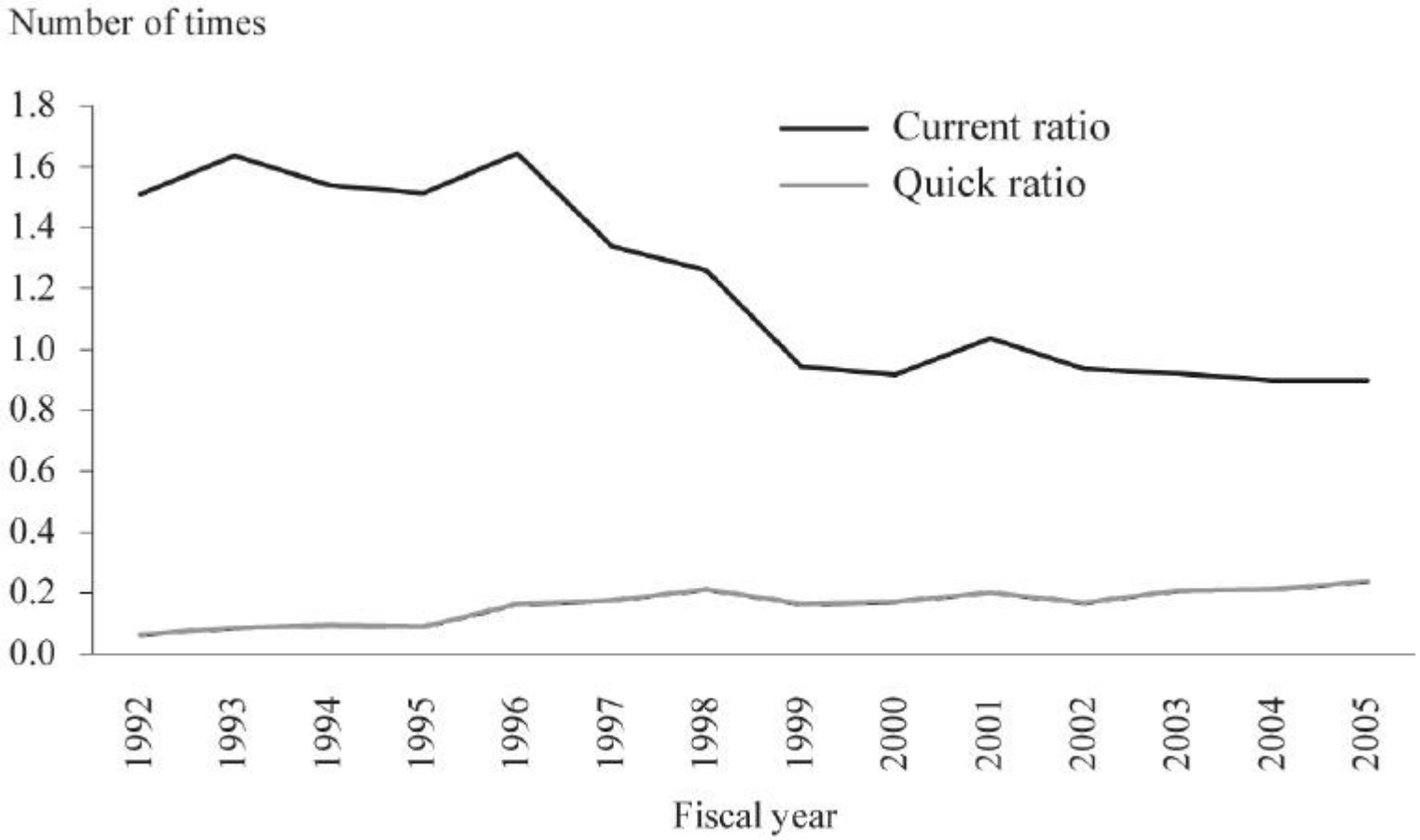
    - (begnning inventory + purchases - cost of goods sold = ending inventory)

Measuring Liquidity

- Ratios measuring asset management:
  - These ratios themselves do not indicate much.
  - useful only when they can be compared:
    - comparisons over time for the same company
    - comparisons over time for the company compared with its peer group

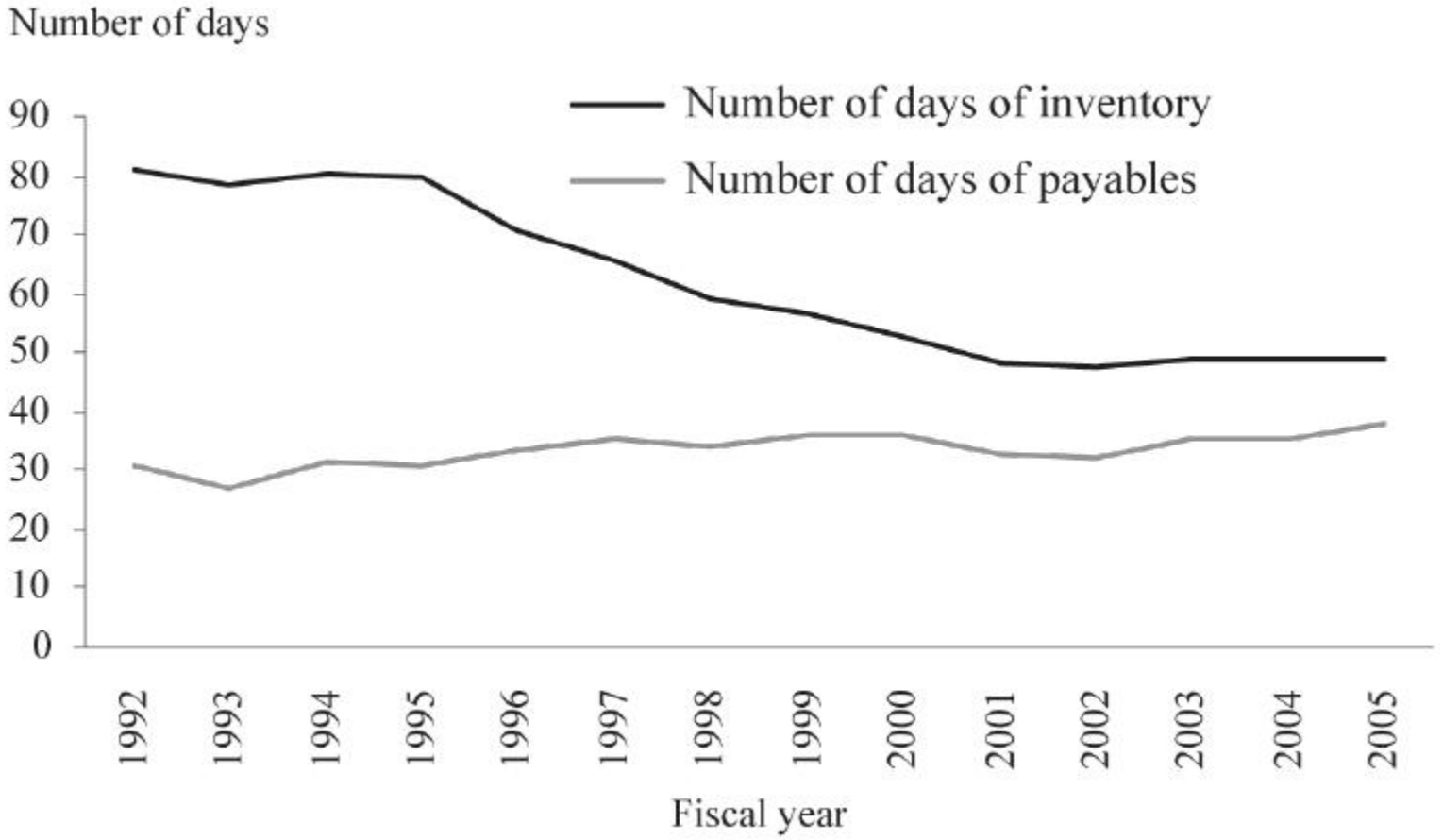
Measuring Liquidity

- Ratios measuring asset management:



Measuring Liquidity

- Ratios measuring asset management:



Measuring Liquidity

- Ratios measuring asset management:
  - Given the following ratios, how well has the company been managing its liquidity for the past two years?

	Current Year		Past Year	
Ratio	**Company**	**Industry**	**Company**	**Industry**
Current ratio	1.9	2.5	1.1	2.3
Quick ratio	0.7	1.0	0.4	0.9
Number of days of receivables	39.0	34.0	44.0	32.5
Number of days of inventory	41.0	30.3	45.0	27.4
Number of days of payables	34.3	36.0	29.4	35.5

LOS 38.c: Evaluate working capital effectiveness of a company based on its operating and cash conversion cycles and compare the company's effectiveness with that of peer companies.

- Ratios measuring asset management:
  - operating cycle is a measure of the time needed to convert raw materials into cash from a sale.

$$\text{Operating cycle} = \begin{matrix}\text{Number of days} \\ \text{of inventory}\end{matrix} + \begin{matrix}\text{Number of days} \\ \text{of receivables}\end{matrix}$$

Measuring Liquidity

- Ratios measuring asset management:
  - net operating cycle (cash conversion cycle) is a measure of the time from paying suppliers for materials to collecting cash from the subsequent sale of goods produced from these supplies.

$$\text{Net operating cycle} = \begin{matrix}\text{Number of days}\\ \text{of inventory}\end{matrix} + \begin{matrix}\text{Number of days}\\ \text{of receivables}\end{matrix} - \begin{matrix}\text{Number of days}\\ \text{of payables}\end{matrix}$$

  - In general, the shorter these cycles the greater a company's cash-generating ability and the less its need for liquid assets or outside finance

LOS 38.d: Describe how different types of cash flows affect a company's net daily cash position.

- MANAGING THE CASH POSITION:
  - Forecasting Short-Term Cash Flows: The uncertainty in forecasting encourages companies to maintain some minimum level of cash on hand as a buffer.
    - Minimum Cash Balances
    - Identifying Typical Cash Flows

Managing The Cash Position

Inflows	Outflows
▪ Receipts from operations, broken down by operating unit, departments, etc.	▪ Payables and payroll disbursements, broken down by operating unit, departments, etc.
▪ Funds transfers from subsidiaries, joint ventures, third parties	▪ Funds transfers to subsidiaries
▪ Maturing investments	▪ Investments made
▪ Debt proceeds (short and long term)	▪ Debt repayments
▪ Other income items (interest, etc.)	▪ Interest and dividend payments
▪ Tax refunds	▪ Tax payments

Managing The Cash Position

- Cash Forecasting Systems

	Short Term	Medium Term	Long Term
Data frequency	Daily/weekly for 4–6 weeks	Monthly for one year	Annually for 3–5 years
Format	Receipts and disbursements	Receipts and disbursements	Projected financial statements
Techniques	Simple projections	Projection models and averages	Statistical models
Accuracy	Very high	Moderate	Lowest
Reliability	Very high	Fairly high	Not as high
Uses	Daily cash management	Planning financial transactions	Long-range financial position

Monitoring Cash Uses and Levels

- Daily cash position refers to uninvested cash balances a firm has available to make routine purchases and pay expenses as they come due.
  - The purpose of managing a firm's daily cash position is to have sufficient cash on hand (that is, make sure the firm's net daily cash position never becomes negative) but to avoid keeping excess cash because of the interest income foregone by not investing the cash.

LOS 38.e: Calculate and interpret comparable yields on various securities, compare portfolio returns against a standard benchmark, and evaluate a company's short-term investment policy guidelines.

- INVESTING SHORT-TERM FUNDS:
  - Short-term working capital portfolios consist of securities that are highly liquid, less risky, and shorter in maturity than other types of investment portfolios.

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
US Treasury Bills (T-bills)	13, 26, and 52 weeks	▪ Obligations of US government (guaranteed), issued at a discount ▪ Active secondary market ▪ Lowest rates for traded securities	Virtually no risk

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Federal agency securities	5–30 days	▪ Obligations of US federal agencies (e.g., Fannie Mae, Federal Home Loan Board) issued as interest-bearing ▪ Slightly higher yields than T-bills	Slight liquidity risk; insignificant credit risk
Bank certificates of deposit (CDs)	14–365 days	▪ Bank obligations, issued interest-bearing in $100,000 increments ▪ "Yankee" CDs offer slightly higher yields	Credit and liquidity risk (depending on bank's credit)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Banker's acceptances (BAs)	30–180 days	▪ Bank obligations for trade transactions (usually foreign), issued at a discount ▪ Investor protected by underlying company and trade flow itself ▪ Small secondary market	Credit and liquidity risk (depending on bank's credit)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Eurodollar time deposits	1–180 days	▪ Time deposit with bank off-shore (outside United States, such as Bahamas) ▪ Can be CD or straight time deposit (TD) ▪ Interest-bearing investment ▪ Small secondary market for CDs, but not TDs	Credit risk (depending on bank) Very high liquidity risk for TDs

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Bank sweep services	1 day	▪ Service offered by banks that essentially provides interest on checking account balance (usually over a minimum level) ▪ Large number of sweeps are for overnight	Credit and liquidity risk (depending on bank)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Repurchase agreements (Repos)	1 day +	▪ Sale of securities with the agreement of the dealer (seller) to buy them back at a future time ▪ Typically over-collateralized at 102 percent ▪ Often done for very short maturities (< 1 week)	Credit and liquidity risk (depending on dealer)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Commercial paper (CP)	1–270 days	▪ Unsecured obligations of corporations and financial institutions, issued at discount ▪ Secondary market for large issuers ▪ CP issuers obtain short-term credit ratings	Credit and liquidity risk (depending on credit rating)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Mutual funds and money market mutual funds	Varies	▪ Money market mutual funds commonly used by smaller businesses ▪ Low yields but high liquidity for money market funds; mutual fund liquidity dependent on underlying securities in fund ▪ Can be linked with bank sweep arrangement	Credit and liquidity risk (depending on fund manager)

INVESTING SHORT-TERM FUNDS

- Short-Term Investment Instruments:

Instruments	Typical Maturities	Features	Risks
Tax-advantaged securities	7, 28, 35, 49, and 90 days	▪ Preferred stock in many forms, including adjustable rate preferred stocks (ARPs), auction rate preferred stocks (AURPs), and convertible adjustable preferred stocks (CAPs) ▪ Dutch auction often used to set rate ▪ Offer higher yields	Credit and liquidity risk (depending on issuer's credit)

INVESTING SHORT-TERM FUNDS

- Computing Yields on Short-Term Investments:

$$\text{Money market yield} = \left(\frac{\text{Face value} - \text{Purchase price}}{\text{Purchase price}}\right)\left(\frac{360}{\text{Number of days to maturity}}\right)$$

$$\text{Bond equivalent yield} = \left(\frac{\text{Face value} - \text{Purchase price}}{\text{Purchase price}}\right)\left(\frac{365}{\text{Number of days to maturity}}\right)$$

$$\text{Discount-basis yield} = \left(\frac{\text{Face value} - \text{Purchase price}}{\text{Face value}}\right)\left(\frac{360}{\text{Number of days to maturity}}\right)$$

  - Returns on the firm's short-term securities investments should be stated as bond equivalent yields.
  - The return on the portfolio should be expressed as a weighted average of these yields.

INVESTING SHORT-TERM FUNDS

- Computing Yields on Short-Term Investments:
  - For a 91-day $100,000 US T-bill sold at a discounted rate of 7.91 percent, calculate thefollowing:
    - 1. Money market yield.
    - 2. Bond equivalent yield.

INVESTING SHORT-TERM FUNDS

- Investment Risks:

Type of Risk	Key Attributes	Safety Measures
Credit (or default)	▪ Issuer may default ▪ Issuer could be adversely affected by economy, market ▪ Little secondary market	▪ Minimize amount ▪ Keep maturities short ▪ Watch for "questionable" names ▪ Emphasize government securities

INVESTING SHORT-TERM FUNDS

- Investment Risks:

Type of Risk	Key Attributes	Safety Measures
Market (or interest rate)	▪ Price or rate changes may adversely affect return ▪ There is no market to sell the maturity to, or there is only a small secondary market	▪ Keep maturities short ▪ Keep portfolio diverse in terms of maturity, issuers

INVESTING SHORT-TERM FUNDS

- Investment Risks:

Type of Risk	Key Attributes	Safety Measures
Liquidity	▪ Security is difficult or impossible to (re)sell ▪ Security must be held to maturity and cannot be liquidated until then	▪ Stick with government securities ▪ Look for good secondary market ▪ Keep maturities short

INVESTING SHORT-TERM FUNDS

- Investment Risks:

Type of Risk	Key Attributes	Safety Measures
Foreign exchange	▪ Adverse general market movement against your currency	▪ Hedge regularly ▪ Keep most in your currency and domestic market (avoid foreign exchange)

INVESTING SHORT-TERM FUNDS

- Strategies:
  - Short-term investment strategies can be grouped into two types:
    - passive strategy:
      - characterized by one or two decision rules for making daily investments.
      - less agressive, priority on safety and liquidity.
      - not have to offer poor return.
    - active strategy: involves constant monitoring and may involve matching, mismatching, or laddering strategies.
      - matching strategy:
        - intentional matching the timing of cash outflows with investment maturities.
        - more conservative of the two.
        - uses many of the same investment types as are used with passive strategies.

INVESTING SHORT-TERM FUNDS

- Strategies:
  - Short-term investment strategies can be grouped into two types:
    - active strategy: involves constant monitoring and may involve matching, mismatching, or laddering strategies.
      - mismatching strategy:
        - intentional mismatching the timing of cash outflows with investment maturities.
        - riskier and requires very accurate and reliable cash forecasts.
        - use more liquid securities such as T-bills.
        - may also use derivatives.

INVESTING SHORT-TERM FUNDS

- Strategies:
  - Short-term investment strategies can be grouped into two types:
    - active strategy: involves constant monitoring and may involve matching, mismatching, or laddering strategies.
      - laddering strategy:
        - scheduling maturities on a systematic basis within the investment portfolio such that investments are spread out equally over the term of the ladder.

INVESTING SHORT-TERM FUNDS

- Cash Management Investment Policy:
  - the objective of cash management is to earn a market return without taking on much risk, either liquidity risk or default risk.
  - It is advisable to have a written investment policy statement.

LOS 38.f: Evaluate a company's management of accounts receivable, inventory, and accounts payable over time and compared to peer companies.

- Managing Accounts Receivable:
  - granting credit and processing transactions
  - monitoring credit balances
  - measuring performance of the credit function.

MANAGING ACCOUNTS RECEIVABLE

- Key Elements of the Trade Credit Granting Process:
  - The major types of credit accounts include the following:
    - open book, which is the most common for company to company;
    - documentary, with or without lines of credit, most common for cross-border transactions;
    - installment credit, with regular timed payments; and
    - revolving credit.

MANAGING ACCOUNTS RECEIVABLE

- Key Elements of the Trade Credit Granting Process:
  - The different forms of terms of credit other than cash, which generally implies 7 to 10 days, include the following:
    - Ordinary terms: Terms are set forth in a standard format—net t or d/t_1 net t_2.
    - Cash before delivery (CBD): terms require that the amount of the invoice must be paid in advance before delivery will be scheduled.
    - Cash on delivery (COD): terms require that payment must be made (usually in the form of a bank check) when the product is delivered; otherwise, no delivery will be made.
    - Bill-to-bill: These terms require that each prior bill must be paid before new shipments are possible.
    - Monthly billing: These terms require payment monthly (2/10th Prox net 30th).

MANAGING ACCOUNTS RECEIVABLE

- Evaluating Accounts Receivable Management:
  - Accounts Receivable Aging Schedule:
    - a breakdown of the accounts into categories of days outstanding.

($ Millions)	January	February	March	April
Sales	530	450	560	680
Total accounts receivable	600	560	650	720
Current (1–30 days old)	330	290	360	280
1–30 days past due	90	120	160	250
31–60 days past due	80	60	60	110
61–90 days past due	70	50	40	50
>90 days past due	30	40	30	30

Aging Expressed as Percent	January	February	March	April
Current (1–30 days old)	55.0	51.8	55.4	38.9
1–30 days past due	15.0	21.4	24.6	34.7
31–60 days past due	13.3	10.7	9.2	15.3
61–90 days past due	11.7	8.9	6.2	6.9
>90 days past due	5.0	7.1	4.6	4.2

MANAGING ACCOUNTS RECEIVABLE

	March			April		
Aging Group	Collection Days[a]	Weight[b] (%)	Weighted Days[c]	Collection Days	Weight (%)	Weighted Days
Current (1–30 days)	20	55.4	11.1	29	38.9	11.3
31–60 days	48	24.6	11.8	55	34.7	19.1
61–90 days	80	9.2	7.4	88	15.3	13.5
91–120 days	110	6.2	6.8	115	6.9	7.9
121+ days	130	4.6	6.0	145	4.2	6.1
Weighted average collection days[d]			43.0			57.9

MANAGING ACCOUNTS RECEIVABLE

- The Number of Days of Receivables:
  - By focusing on the time it takes to collect receivables, the weighted average collection period is a good measure of how long it is taking to collect from the company's customers regardless of the sales level or the changes in sales.
  - The primary drawback to this measure is that it requires more information than number of days of receivables, and this information is not readily available, especially for comparisons among companies.

MANAGING INVENTORY

- The primary goal for an inventory system is to maintain the level of inventory.
- Inventory management involves balancing: having sufficient inventory, but not too much.
- The motives for holding inventory include:
  - transactions motive
  - precautionary motive
  - speculative motive

MANAGING INVENTORY

- Evaluating Inventory Management:
  - compute the inventory turnover ratio and the number of days of inventory.
    - Inventory turnover will vary among industries.
    - Inventory turnover may differ among companies within an industry because of different product mixes.

MANAGING ACCOUNTS PAYABLE

- The Economics of Taking a Trade Discount:
  - One key activity that companies should review from time to time is the evaluation of trade discounts.

$$\text{Cost of trade credit} = \left(1 + \frac{\text{Discount}}{1 - \text{Discount}}\right)^{\left(365 \Big/ \begin{array}{l}\text{Number of days}\\ \text{beyond discount period}\end{array}\right)} - 1$$

  - If the customer's cost of funds or short-term investment rate is less than the calculated rate, the discount offers a better return or incremental return over the company's short-term borrowing rate.

MANAGING ACCOUNTS PAYABLE

- The Economics of Taking a Trade Discount:
  - Compute the cost of trade credit if terms are 1/10, net 30 and the account is paid on:
    - the 20th day, and
    - the 30th day.

MANAGING ACCOUNTS PAYABLE

- Evaluating Accounts Payable Management:
  - The number of days of payables, which is also referred to as the average age of payables, is a useful measure in evaluating a company's credit extension and collection.

$$\text{Number of days of payables} = \frac{\text{Accounts payable}}{\text{Average day's purchases}}$$

  - Comparing the number of days of payables with the credit terms under which credit was granted to the company is important; paying sooner than necessary is costly in terms of the cost of credit, and paying later than the net day is costly in terms of relations with suppliers.

LOS 38.g: Evaluate the choices of short-term funding available to a company and recommend a financing method.

Sources of Short-Term Financing: Bank Sources				
Source/Type	Users	Rate Base	Compensation	Other
Uncommitte line	Large corporations	Prime (US) or base rate (other countries), money market, Libor +	None	Mainly in United States; limited reliability
Regular line	All sizes		Commitment fee	Common everywhere
Overdraft line	All sizes		Commitment fee	Mainly outside United States
Revolving credit agreement	Larger corporations		Commitment fee+ extra fees	Strongest form (primarily in United States)

Sources of Short-Term Financing:

Bank Sources				
Source/Type	Users	Rate Base	Compensation	Other
Collateralized loan	Small, weak borrowers	Base +	Collateral	Common everywhere
Discounted receivables	Large companies	Varies	Extra fees	More overseas, but some in United States
Banker's acceptances	International companies	Spread over commercial paper	None	Small volume
Factoring	Smaller	Prime + +	Service fees	Special industries

Sources of Short-Term Financing:

Nonbank Sources				
Source/Type	Users	Rate Base	Compensation	Other
Nonbank finance companies	Small, weak borrowers	Prime + + +	Service fees	Weak credits
Commercial paper	Largest corporations	Money market sets rate	Backup line of credit, commissions +	Lowest rates for shortterm funds

MANAGING ACCOUNTS PAYABLE

- Short-Term Borrowing Approaches:
  - The major objectives of a short-term borrowing strategy include the following:
    - Ensuring that there is sufficient capacity to handle peak cash needs.
    - Maintaining sufficient sources of credit to be able to fund ongoing cash needs.
    - Ensuring that rates obtained are cost-effective and do not substantially exceed market averages.
  - several factors that borrowers should consider:
    - Size and credit-worthiness
    - Sufficient access
    - Flexibility of borrowing options

MANAGING ACCOUNTS PAYABLE

- Asset-Based Loans:
  - Many companies without sufficient credit quality may borrow from financial institutions by arranging for a secured loan, where the loan is secured using assets of the company. These secured loans are often referred to as asset-based loans.
    - assignment of accounts receivable
    - factoring of accounts receivable
    - inventory blanket lien
    - trust receipt arrangement
    - warehouse receipt arrangement

MANAGING ACCOUNTS PAYABLE

- Computing the Costs of Borrowing:
  - In the case of a line of credit that requires a commitment fee, the cost of the line of credit is:

$$\text{Cost} = \frac{\text{Interest} + \text{Commitment fee}}{\text{Loan amount}}$$

  - If the interest rate is stated as “all inclusive” such that the amount borrowed includes the interest, as may be the case in a banker’s acceptance, the interest is compared with the net proceeds when determining the cost:

$$\text{Cost} = \frac{\text{Interest}}{\text{Net proceeds}} = \frac{\text{Interest}}{\text{Loan amount} - \text{Interest}}$$

MANAGING ACCOUNTS PAYABLE

- Computing the Costs of Borrowing:
  - If there are dealer's fees and other fees, the expenses beyond the interest must be considered when determining the cost. For example, if a borrowing involves a dealer's fee and a backup fee and is quoted as all inclusive, the cost is:

$$\text{Cost} = \frac{\text{Interest} + \text{Dealer's commission} + \text{Backup costs}}{\text{Loan amount} - \text{Interest}}$$

  - The key is to compare the interest and fees paid with the net proceeds of the loan. If the loan is for a period less than a year, then we annualize accordingly.

MANAGING ACCOUNTS PAYABLE

- Computing the Costs of Borrowing:
  - You are asked to select one of the following choices as the best offer for borrowing $5,000,000 for one month:

    1. Drawing down on a line of credit at 6.5 percent with a 1/2 percent commitment fee on the full amount. Note: One-twelfth of the cost of the commitment fee (which gives an option to borrow any time during the year) is allocated to the first month.
    2. A banker's acceptance at 6.75 percent, an all-inclusive rate.
    3. Commercial paper at 6.15 percent with a dealer's commission of 1/8 percent and a backup line cost of 1/4 percent, both of which would be assessed on the $5 million of commercial paper issued.

THANKS