



CredGuild

STUDY NOTES

CFA® Program Level I

Corporate Finance

2027 curriculum · 7 readings · 25 practice questions

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ABOUT THIS EDITION

CredGuild · CFA® Program Level I · Corporate Finance
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USING THIS BOOK

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How to use this book

These are the CredGuild notes for the 2027 CFA® Program Level I curriculum, Corporate Finance: 7 readings. They are the same notes as on credguild.com, set out for reading on paper or offline.

What each reading contains

- **What you'll learn:** the learning outcome statements the reading covers.
- **The notes, module by module:** worked examples, key concepts, common exam traps, exam shortcuts and a bottom line.
- **A quick check after each module:** one question with its answer and the full explanation.
- **Practice questions at the end, with the answers.** The full explanation for each one is free on the reading's page at credguild.com; the link is under the answers.

The coloured boxes

KEY CONCEPT

Definitions and formulas to know.

Example. A worked problem, step by step. Try it before you read the working.

COMMON EXAM TRAPS

Mistakes that cost marks.

EXAM SHORTCUTS

Faster ways through a question.

BOTTOM LINE

What to remember from the module.

Using it with the website

Paper is good for reading. Practice works better on the site: it scores each answer as you go, explains every option, keeps a list of the questions you got wrong and spreads the readings across the weeks before your exam. If you are not sure where to start, the free diagnostic test (credguild.com/cfa/level-1/diagnostic/) gives you a score in each topic.

If this book helps you, pass it on to someone else who is studying.

CFA® PROGRAM LEVEL I · TOPIC

Corporate Finance

Exam weight 6–9% · 7 readings

How companies are organized and governed and whose interests they serve, how they manage working capital and liquidity, which investments they choose and how they fund them, and how a business model earns its money.

Reading 20	Organizational Forms, Corporate Issuer Features, and Ownership
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Reading 21	Shareholder vs Stakeholder
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Reading 22	Principal Agent Problem
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Reading 23	Cash Conversion Cycle
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Reading 24	NPV vs IRR
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Reading 25	Modigliani Miller
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Reading 26	Business Models
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CORPORATE FINANCE · READING 20

Organizational Forms, Corporate Issuer Features, and Ownership

What you'll learn

LOS 20.a Compare sole proprietorships, general and limited partnerships, and corporations by legal identity, owner-operator separation, liability, taxation and access to capital.

LOS 20.b Describe the key features of corporations: separate legal identity, shareholder voting and limited liability, dividends, and double taxation.

LOS 20.c Compare public (listed) and private companies, and the ways a private company goes public or a public company goes private.

MODULE 20.1

Features of Corporate Issuers

This reading compares sole proprietorships, partnerships and corporations by legal identity, the link between owners and operators, owner liability, taxation and access to capital, and describes the key features of corporate issuers, including the double taxation of dividends. It then contrasts public and private companies and the ways a company goes public or private.

LOS 20.a — Comparing organizational forms

A business's **organizational form** is its legal and organizational set-up. Five features separate one form from another:

1. whether the business is a **separate legal entity** from its owners;
2. whether the owners also run the business, and if not, how owners and operators are related;
3. whether the owners' liability for the business's debts and actions is **limited liability** or **unlimited liability**;
4. how the profits (or losses) are taxed;
5. how easily the business can raise more capital and spread its risk.

The four common forms

- **Sole proprietorship:** one person owns and runs the business. The law does not separate the business from its owner: all profits and losses are hers, profits are taxed as her **personal income**, and she has unlimited liability for the business's obligations. Growth is limited to what one individual can finance.
- **General partnership:** two or more partners pool their capital and share the risk, so the business can operate on a larger scale than a sole proprietorship. The partners run it under a **partnership agreement** (written, verbal, or implied by how the partners act) that sets out duties and profit shares. Every **general partner** has unlimited liability, and each partner's share of profit is taxed as personal income.
- **Limited partnership:** two classes of partner. There must be at least one general partner, who runs the business and has unlimited liability, and at least one **limited partner**, whose liability is capped at the amount invested and whose profit claim is proportional to that investment. Limited partners usually do not take part in management and usually do not appoint or remove the general partners. Exam convention: because general partners run the business, they typically receive a larger portion of the profits than the limited partners. Current practice: the comparison is best read per unit of capital, since general partners usually earn a

promote or carried interest on top of a pro-rata share, while limited partners, who often supply most of the capital, can still receive most of the profits in absolute terms. Profits are taxed as personal income of each partner.

- **Limited liability partnership (LLP)**: permitted in some jurisdictions; no general partner is required, so all partners have a liability shield. Unlike the passive limited partners of an LP, LLP partners may take part in running the firm. Exam convention: in the United States, LLPs are open only to providers of professional services such as law and accounting, with limits on the number of partners and the equity invested. Current practice: the rules are set state by state; some states restrict LLPs to designated professions, while others allow any partnership to register as an LLP.
- **Corporation (a limited company)**: a legal entity separate from its owners and managers. All **shareholders** have limited liability: the most an owner can lose is the amount invested in the shares. Owners and managers are separated: shareholders elect a **board of directors**, which hires senior managers to run the company in shareholders' interests. Corporations have the widest access to capital, both **debt** (borrowed capital) and **equity** (ownership capital), which is why most large firms are corporations. Because owners do not have to run the business, a corporation can raise equity from many investors who want a share of the profits but no role in management.

KEY CONCEPT

Feature	Sole proprietorship	General partnership	Limited partnership	Corporation
Separate legal entity	No	No*	No*	Yes
Owners also operate?	Yes	Yes (all partners)	General partners only	No; board hires managers
Owner liability	Unlimited	Unlimited	GPs unlimited, LPs limited	Limited
Taxation of profits	Personal income	Personal income	Personal income	Corporate tax, then possibly tax on dividends
Access to capital	Limited (one owner)	Limited (partners)	Limited (partners)	Greatest (debt and equity)

*Exam convention: a partnership is an extension of its partners, and only the corporation is a separate legal entity. Current practice: many US states, under the Revised Uniform Partnership Act, treat a partnership as a separate entity, but its general partners remain personally liable.

A **public corporation** (public limited company) has shares that are sold to the public. Most public limited companies are listed, so their shares trade on a stock exchange. A **private limited company** has a limited number of shareholders, and the transfer of its shares is restricted.

Common exam traps

- A limited partnership needs a minimum of one general partner and one limited partner. Two of either class is not required.

- Assuming a general partner's liability is capped because the business is a limited partnership. Only the limited partners have limited liability.
- Treating separate legal identity and limited liability as one feature. Where a partnership is a separate entity, its general partners are still personally liable; limited liability for every owner is what sets the corporation apart.
- Applying double taxation to a partnership. Partnership profit is taxed once, as the partners' personal income.

LOS 20.b — Key features of corporate issuers

- *Legal identity.* A corporation is formed by filing **articles of incorporation** with a regulator. As a legal person it can hire employees, sign contracts, borrow and lend.
- *Shares and voting.* Issuing shares lets a corporation raise large amounts of capital. Shareholders have **voting rights** to elect the board; listed shares are easy to transfer.
- *Dividends.* The board *may* distribute part of earnings as **dividends**; the corporation is not required to do so.
- **Double taxation.** Where a country taxes corporate earnings *and* taxes dividends as personal income, distributed profit is taxed twice. The burden is smaller when a company pays out less and reinvests more.

KEY CONCEPT

$$\text{effective tax rate on distributed profit} = t_c + t_d(1 - t_c)$$

More generally, with payout ratio p : total tax per unit of pretax profit = $t_c + t_d \times p \times (1 - t_c)$.

Example. Pretax profit is \$1,000, the corporate rate is 30% and dividends are taxed at 10%.

- Full payout: corporate tax \$300; dividends \$700; dividend tax \$70; total \$370, an effective rate of 37.0%.
- Half of after-tax profit paid out: corporate tax \$300; dividends \$350; dividend tax \$35; total \$335, an effective rate of 33.5%.

Common exam traps

- The dividend tax applies to the after-tax profit that is actually paid out. Applying it to pretax profit overstates the tax. In the full-payout example, a dividend tax on the \$1,000 pretax profit gives a total of \$400 (40.0%) instead of \$370 (37.0%).

LOS 20.c — Public versus private companies

Most public limited companies are **listed companies**: their shares are listed on a stock exchange, a rules-based open market with price and volume transparency. Shareholders may be individuals, other corporations, nonprofits or governments. Shares that are actively traded (those not held by insiders, strategic investors or sponsors) form the **free float**, usually quoted as a percentage of total shares outstanding:

$$\text{free float (\%)} = \frac{\text{shares outstanding} - \text{shares held by insiders, strategic investors and sponsors}}{\text{shares outstanding}}$$

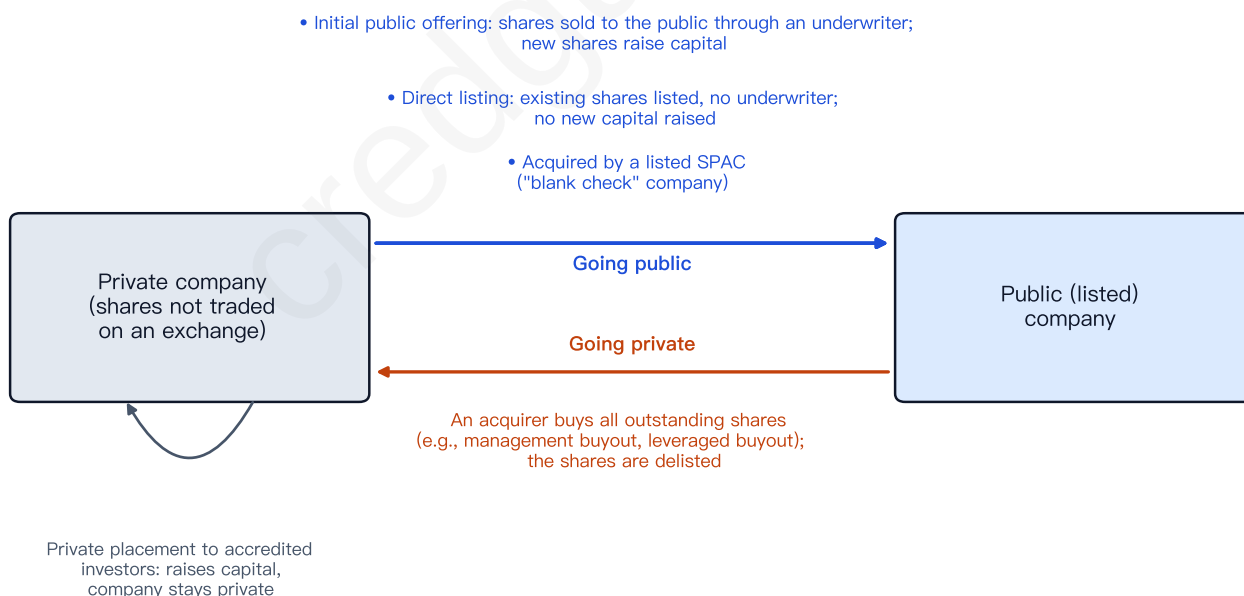
Public companies must meet compliance and reporting requirements, such as filing quarterly or annual financial reports with a regulator and disclosing material changes in the business or its ownership. **Private companies** face fewer regulatory requirements, disclose less, and can take a longer-term view; but their shares do not trade on an exchange, so value is hard to observe and exit is difficult (investors usually wait for an IPO or a sale of the company).

KEY CONCEPT

	Public (listed) company	Private company
Share trading	On an exchange; price observable	No exchange; transfer difficult
Periodic reporting to regulators	Required	Generally not required
Raising equity	Public offerings	Private placements to accredited investors (corporate and institutional investors, high-net-worth individuals)
Investment horizon	Pressure from public investors	Can take a longer-term view

Moving between private and public

The figure summarizes the routes described below.



Routes between private and public ownership

Ways to go public:

- **Initial public offering (IPO):** the company's shares are first sold to the public, usually through an **underwriter** (investment bank). The company must meet the listing requirements of the chosen exchange. Once the shares are listed, investors buy and sell them among themselves without dealing with the company. An IPO typically includes new shares that raise equity capital; existing shareholders may also sell some of their shares in the offering.
- **Direct listing:** an exchange lists the company's existing shares. It is faster than an IPO and needs no underwriter. Exam convention: a direct listing raises no new capital for the company. Current practice: that describes the traditional (secondary) direct listing; some exchanges (e.g., NYSE) also permit a primary direct listing, in which the company sells new shares in the opening auction.
- Acquisition by a **special purpose acquisition company (SPAC)**, a "blank check" company that raises money in its own IPO, holds it in trust, and must use it to acquire a (not-yet-identified) private company within a set time. Because the SPAC is already listed, the acquired business becomes part of a listed company when the deal closes.

Going private. An acquirer buys all outstanding shares, for example in a **management buyout** or a **leveraged buyout**, and the company is delisted, often to restructure an underperforming firm with a lighter regulatory burden.

Common exam traps

- Assuming that going public always raises money for the company. Only newly issued shares do: a direct listing of existing shares raises none, and existing shares sold in an IPO pay the selling shareholders.
- A private placement raises capital but does not make the company public; buyouts take companies private.
- Computing free float from all shares outstanding. Holdings of insiders, strategic investors and sponsors are not actively traded and must be left out.

EXAM SHORTCUTS

- To decide whether going public raises money for the company, ask whether new shares are issued: new shares in an IPO raise capital, while existing shares sold in an IPO pay the selling shareholders, and under the exam convention a direct listing raises no new capital (current practice also allows a primary direct listing that sells new shares).

BOTTOM LINE

- Organizational forms differ in whether the law treats the business as distinct from its owners, whether owners also operate it, whether owner liability is limited, how profits are taxed and how easily it can raise capital.
- In a sole proprietorship and a general partnership the owners run the business, have unlimited liability and pay personal income tax on its profits.
- A limited partnership needs at least one general partner, who runs the business with unlimited liability, and at least one limited partner, whose liability is capped at the amount invested and who usually takes no part in management.
- A corporation exists as a legal person distinct from its owners and managers, all shareholders have limited liability, the shareholders elect a board that hires managers, and it has the widest access to debt and equity capital.

- Where both corporate earnings and dividends are taxed, the effective rate on distributed profit is $t_c + t_d(1 - t_c)$, and paying out less of the profit reduces the double-taxation burden.
- Most public companies are listed, so their shares trade on an exchange, and they must meet compliance and reporting requirements, while private companies disclose less, raise equity through private placements to accredited investors and offer investors no easy exit.
- Free float is the actively traded part of the shares outstanding, which excludes holdings of insiders, sponsors and strategic investors.
- A private company goes public through an IPO, a direct listing or acquisition by a SPAC, and a public company goes private when an acquirer, as in a management or leveraged buyout, buys all its shares and delists it.

QUICK CHECK

Question 1

Two siblings plan to buy and operate a vineyard. They will manage it themselves and accept unlimited liability for its debts. Four cousins will contribute capital but will take no part in running the business and want their liability capped at the amount they invest. The *most appropriate* organizational form is a:

- A limited partnership.
- B general partnership.
- C limited liability partnership.

Answer: A

A limited partnership combines general partners, who manage the business and have unlimited liability (the siblings), with limited partners, whose liability is limited to their investment (the cousins). That is the mix described.

Why the other options are wrong

- **B.** In a general partnership every partner is a general partner with unlimited liability, so the cousins could not cap their liability.
- **C.** A limited liability partnership has no general partner: every partner has a liability shield. It does not fit owners who choose to accept unlimited liability, and some US states restrict LLPs to designated professions such as law and accounting.

Key takeaway Mixed roles (managers with unlimited liability + passive investors with limited liability) point to a limited partnership.

Practice questions

Question 2

An analyst drafts a list of features of Kittredge Marine, a corporation. Which item on her list is *incorrect*?

- A Kittredge's shareholders do not have to take part in managing the company.
- B Kittredge has no legal identity apart from that of its shareholders.
- C Kittredge's profits may be taxed at the corporate level and again when paid out as dividends.

Question 3

Brenmoor Robotics is privately held. Its board wants to bring in new equity capital and, at the same time, allow its shares to be bought and sold by the public on a stock exchange. The board is *most likely* to pursue:

- A a direct listing of its existing shares.
- B a management buyout.
- C an initial public offering.

Answers: 2. B · 3. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/organizational-forms-corporate-issuer-features-and-ownership/. The full bank has 18 questions on this reading.

CORPORATE FINANCE · READING 21

Shareholder vs Stakeholder

What you'll learn

LOS 21.a Compare the claims, risk and upside of lenders (debtholders) and shareholders, and why their interests can conflict.

LOS 21.b Describe a company's stakeholder groups (shareholders, lenders, board, managers, employees, suppliers, customers, governments) and compare their interests under shareholder and stakeholder theory.

LOS 21.c Describe the environmental, social and governance (ESG) factors investors consider and how ESG risks affect equity and debt investors.

MODULE 21.1

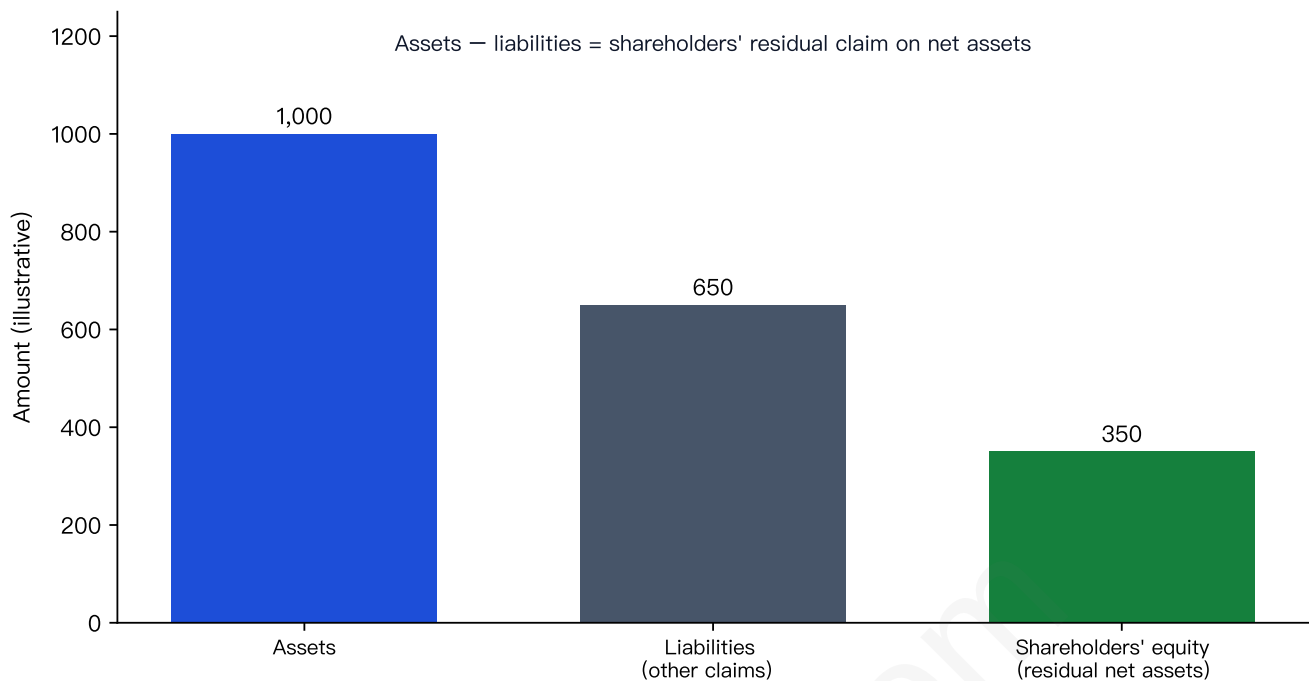
Stakeholders and ESG Factors

This reading contrasts what lenders and shareholders are owed and what each of them wants, including how leverage changes return on equity. It then describes a company's other stakeholder groups and board structures, and the environmental, social and governance factors that investors evaluate.

LOS 21.a — Lenders versus shareholders

Lenders (debtholders) have a legal, **contractual claim** to the interest and principal the company has promised to pay. **Shareholders** (equity holders, owners) have a **residual claim**: whatever is left of the company's net assets after all other claims are met. Lenders therefore rank ahead of owners, debt is less risky than equity, and debt is the cheaper form of capital. In most tax systems interest is also deducted in computing the company's taxable income, whereas dividends are paid out of after-tax profit.

The figure illustrates the balance-sheet claim: shareholders' residual is the company's net assets after liabilities, not an automatic distribution of annual net income.



Shareholders' residual claim on net assets (illustrative values)

Both groups can lose their whole investment if the firm fails, but no more than they put in. The difference lies in the upside:

KEY CONCEPT

	Debtholders	Equity holders
Claim	Contractual: promised interest + principal	Residual: net assets after all other claims
Priority	Higher	Lower
Best case	Receive exactly what was promised	Theoretically unlimited gains
Worst case	Lose the investment	Lose the investment
Attitude to risk-increasing growth	May oppose: more default risk, no extra return	May favor: they keep the upside

Firm value = value of debt + value of equity. While the firm is worth more than its debt, extra value accrues to equity and the debt value stays roughly constant; if the firm becomes worth less than its debt, equity is worth zero and debt value falls with firm value.

Example: leverage and ROE. A firm needs \$800 of assets; revenue is \$600 and cash operating expenses are \$480 (no taxes), so operating income is \$120 (a 15% return on assets).

- All-equity: $ROE = 120/800 = 15\%$.
- Half debt at 6%: interest = $0.06 \times 400 = \$24$; net income = \$96; $ROE = 96/400 = 24\%$.

- If revenue falls 20% to \$480 while operating expenses stay at \$480, operating income is zero: ROE is 0% unlevered but $-24/400 = -6\%$ levered, and lenders are still owed their \$24.

Leverage raises ROE as long as the firm earns more on its assets than it pays on its debt; when it earns less, leverage lowers ROE and magnifies any loss. Lenders get only their promised return either way, so they have no upside and only downside. Shareholders therefore may favor adding debt to fund growth (it also avoids diluting their ownership), while existing lenders resist; lenders protect themselves with **covenants**, such as a maximum leverage ratio or a minimum interest coverage ratio.

Common exam traps

- Only interest and principal are contractual; common and preferred dividends are paid at the board's discretion.

LOS 21.b — Stakeholder groups and their interests

Under **shareholder theory**, corporate governance focuses on shareholders' interest in maximizing the market value of common equity, so the main conflict is the one between shareholders (the owners) and the managers they employ. Under **stakeholder theory**, the focus is broader: governance must balance the competing interests of shareholders and the other groups affected by the company's actions: creditors, employees, suppliers, customers, communities and governments.

KEY CONCEPT

Stakeholder	Main interests
Shareholders	Residual claim; vote to elect the board; want profitability and growth in share value. Residual claim with theoretically unlimited upside, and they can diversify their portfolios cheaply, so they may favor riskier growth.
Lenders — public bondholders and private debtholders (banks)	Timely interest and principal; solvency. Private lenders may see nonpublic information (less information asymmetry), which makes them a key funding source for small and medium-sized firms; some also hold equity and may be more willing to renegotiate loan terms. Bondholders rely on public information and have little or no influence over operations. Both are protected by covenants.
Board of directors	Protect shareholders' interests; hire, fire and pay senior managers; set strategy; monitor performance.
Senior managers	Salary, bonus, perks, continued employment. Bonuses tied to firm performance give them a stake in its financial success. Their employment income is tied to the firm, so they may choose less business risk than shareholders would.
Employees	Pay, advancement, training, working conditions, firm sustainability; may own shares through employee stock plans; in some industries they bargain through unions.

Stakeholder	Main interests
Suppliers	Ongoing, profitable trade relationship; as short-term creditors, the firm's solvency and stability.
Customers	Quality product at a fair price; after-sale support; increasingly, the firm's social and environmental record.
Governments / regulators	Tax revenue, job creation, economic growth, social welfare; compliance with laws.

Board structure. Boards include **inside directors** (executives, founders) and **independent directors** with no material relationship to the company, who better protect shareholders. A **one-tier board** puts both on one board; exchanges typically require a majority of independent directors and may also require a range of backgrounds and skills. In a **two-tier board** (continental Europe), a **supervisory board** oversees a **management board** of insiders. In a **staggered board**, only a fraction of directors is elected each year, which makes a rapid overhaul by shareholders harder; companies defend it as giving continuity and a longer-term view of strategy. Minority shareholders generally prefer a majority-independent board elected in full.

Common exam traps

- Stakeholder theory does not put other groups in place of shareholders; it balances all groups, shareholders included.
- Lenders are less keen on a riskier strategy than suppliers. Both are creditors, but suppliers also gain from a customer's growth through more trade, while lenders can receive no more than the promised payments.
- When the firm's financial position weakens, shareholders absorb losses first, and the groups whose claims depend on its solvency are directly exposed: lenders, suppliers as short-term creditors, and managers and employees whose pay and jobs are at stake. Customers tend to be less affected than these groups. They mainly want a good product at a fair price, although they can lose after-sale support.

LOS 21.c — ESG factors considered by investors

Investors who take a stakeholder perspective evaluate **environmental, social, and governance (ESG)** factors because (1) governments increasingly push climate and social policy through regulation, (2) ESG issues can hit results through lost customer goodwill, fines and legal judgments, (3) poor governance lets managers exploit shareholders, and (4) many younger investors want ESG considered. **Negative externalities**, costs a firm imposes on others without bearing them, increasingly have to be recognized, explicitly or implicitly.

KEY CONCEPT

Factor	Examples
Environmental	Climate change, air and water pollution, deforestation, energy efficiency, waste management, water scarcity
Social	Customer privacy and data security, customer satisfaction, employee engagement, diversity and inclusion, labor relations, community relations

Factor	Examples
Governance	Board and audit committee composition, executive compensation, bribery and corruption, political contributions, lobbying

Climate-related risks come in two forms: **physical risk**, which is damage to assets or operations from more frequent severe weather, and **transition risk**, which arises when regulation or consumer choices force a move from high-carbon to low-carbon activity. Assets made unviable by such changes are **stranded assets**; an example is a plant closed because retrofitting it to new emissions rules is uneconomic. Resource-intensive industries affect the environment directly, while other industries may affect it indirectly. Weak safety policies or governance raise the risk of events such as oil spills or groundwater contamination, whose penalties, cleanup, litigation and reputational costs can be large.

Social factors shape how the company is seen to treat employees, customers and communities. Lowering social risk can cut costs through higher productivity, lower staff turnover, more loyal customers and fewer lawsuits. Governance systems need checks that keep managers acting ethically, lawfully and in shareholders' interests.

Who bears ESG risk. Analysts identify and measure the ESG risks a company faces and how they could affect the cash flows it generates in the future. Adverse ESG outcomes fall most heavily on equity investors. Debt investors are hurt mainly if losses are large enough to cause default. Because some ESG risks may take years to appear (a plant that complies today may become obsolete later), holders of longer-maturity debt may be more exposed than short-term lenders.

Common exam traps

- A carbon tax or a shift in customer demand toward low-carbon products is transition risk even though climate change is the underlying cause. Physical risk is damage done by the weather itself.

EXAM SHORTCUTS

- Compare the return on assets with the cost of debt before computing ROE: if the firm earns more on its assets than it pays on its debt, leverage raises ROE, and if it earns less, leverage lowers ROE.
- Classify a climate risk by its channel: damage done by the weather itself is physical risk, while a carbon tax, a new rule or a shift in demand toward low-carbon products is transition risk.

BOTTOM LINE

- Lenders have a contractual claim to promised interest and principal and rank ahead of shareholders, whose claim is residual, so debt is less risky than equity and the cheaper form of capital.
- Lenders and shareholders can each lose their whole investment but no more, yet lenders can receive at most the promised payments while equity has theoretically unlimited upside, so shareholders may favor risk-increasing growth that lenders resist with covenants.
- Shareholder theory focuses governance on maximizing the market value of common equity and on the conflict between shareholders and managers, while stakeholder theory balances the interests of shareholders and all other affected groups.
- Private lenders such as banks may see nonpublic information, which makes them a key funding source for small and medium-sized firms, while bondholders rely on public information and have little influence over operations.

- Independent directors better protect shareholders than inside directors; a two-tier board has a supervisory board overseeing a management board, and a staggered board makes a rapid overhaul by shareholders harder.
- Investors evaluate ESG factors because regulation increasingly targets climate and social issues, ESG problems can cause lost goodwill, fines and judgments, poor governance lets managers exploit shareholders, and many younger investors want ESG considered.
- Climate change brings physical risk from severe weather and transition risk from regulation or consumer choices, and assets made unviable by these changes are stranded assets.
- Adverse ESG outcomes fall most heavily on equity investors, debt investors are hurt mainly if losses cause default, and holders of longer-maturity debt may be more exposed than short-term lenders.

QUICK CHECK

Question 1

Orrin Freight has bank loans, preferred stock and common stock outstanding. Which of the following payments are contractual obligations of Orrin?

- A** Interest and principal on its bank loans.
- B** Interest on its loans and dividends on its common stock.
- C** Interest and principal on its loans, and dividends on its preferred stock.

Answer: A

Lenders have a legal, contractual claim to the interest and principal payments the company has promised. Owners have only a residual claim: the company may pay dividends, but it is not required to.

Why the other options are wrong

- **B.** Common stock dividends are paid at the board's discretion. They are not a contractual obligation.
- **C.** Preferred stock dividends are also not a contractual obligation of the company. Only interest and principal owed to lenders are.

Key takeaway Contractual = interest + principal to lenders. Dividends (common or preferred) = discretionary distributions to owners.

Practice questions

Question 2

Which of the following *best* describes the primary focus of the stakeholder theory of corporate governance?

- A** Serving the interests of groups other than shareholders in place of the interests of shareholders.
- B** Maximizing the market value of the company's common equity.
- C** Resolving the conflicting interests of the company's managers and the various groups affected by what the company does.

Question 3

Ardent Power generates most of its electricity from coal. New national emissions limits and a steady shift in customer demand toward low-carbon energy threaten to make several of its plants uneconomic before the end of their useful lives. The climate-related risk Ardent faces is *best* described as:

- A physical risk.
- B transition risk.
- C governance risk.

Answers: 2. C · 3. B

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/shareholder-vs-stakeholder/. The full bank has 16 questions on this reading.

credguild.com

CORPORATE FINANCE · READING 22

Principal Agent Problem

What you'll learn

LOS 22.a Describe the principal-agent relationship and the conflicts between shareholders and managers/directors, between groups of shareholders, and between creditors and shareholders.

LOS 22.b Describe corporate governance and the mechanisms (shareholder, creditor, board committee, employee, customer/supplier, government) used to manage stakeholder relationships.

LOS 22.c Describe the risks of poor corporate governance and stakeholder management and the benefits of effective governance.

MODULE 22.1

Corporate Governance

This reading describes principal-agent relationships and the conflicts that arise between shareholders and managers or directors, between groups of shareholders, and between creditors and shareholders. It then sets out corporate governance and the mechanisms each stakeholder group uses, including the board and its committees, and the risks of poor governance and the benefits of effective governance.

LOS 22.a — Principal-agent relationships and conflicts

When one party (the principal) hires another (the agent) to act on its behalf, they are in a **principal-agent relationship**. A **principal-agent conflict** can arise because the agent's own interests may differ from the principal's. Example: a sales agent paid per contract signed has an incentive to sign up poor-quality customers the firm would rather refuse; the firm responds with acceptance standards and by dropping agents who act against it. **Agency costs** are the costs of such conflicts. *Direct* agency costs include the cost of monitoring the agent; *indirect* agency costs include business lost because of the conflict.

Shareholders vs. managers and directors

In a corporation, shareholders are the principals, and managers and directors are their agents. Conflicts also arise when inside directors side with management against shareholders, or when directors favor one group of shareholders over another. Typical conflicts:

KEY CONCEPT

Conflict

What happens

Insufficient effort

Managers give the firm too little time or attention (for example, because of outside commitments); projects and risks are poorly evaluated and total costs rise

Risk appetite

Managers' income depends on one firm, and managers paid mainly in cash share little in the gains, so they may take too little risk; managers paid mainly in **options** (no downside) may take too much

Empire building

Pay tied to company size encourages unnecessary or poor acquisitions

Conflict**What happens****Entrenchment**

Managers take inadequate risk, copy competitors, or undertake projects that would not otherwise pay off but rely on their personal expertise; directors go along with management rather than challenge it

Self-dealing

Managers use company resources for personal benefit

Information asymmetry, the fact that managers know more about the firm than shareholders do, makes monitoring harder. It is more severe for large, multi-business or multinational firms, firms with complex products, and firms with low institutional ownership or low free float.

Between groups of shareholders

Controlling shareholders hold most of the votes and may act against minority shareholders. A controlling owner with most of his wealth in the firm may want it to diversify into unrelated businesses; already-diversified minority owners would rather it did not waste resources doing so. A **dual-class structure** gives one share class (often founders') more votes than its economic claim. CFA Institute opposes dual-class voting structures: they let one group of shareholders pursue its own interests at the expense of the others.

Example. A company has 100 million Class A shares with one vote each, held by the public, and 25 million Class B shares with ten votes each, held by its founders. The founders own $25/125 = 20\%$ of the shares but cast $250/(100 + 250) = 71\%$ of the votes, so they decide board elections.

Creditors vs. shareholders

Creditors' upside is capped while shareholders' is not, so shareholders may want the company to take more business risk than creditors would like. Actions that shift value from creditors to shareholders include issuing new debt that raises existing lenders' default risk, or paying larger dividends that shrink the asset base. The risk is greatest for long-term debtholders.

Common exam traps

- Directors are agents of the shareholders even though they hire and oversee the managers.
- Entrenchment shows up as too little risk-taking (copying competitors, otherwise unprofitable projects that depend on the manager's own knowledge). Excessive risk-taking points to option-heavy pay instead.

LOS 22.b — Corporate governance and stakeholder mechanisms

Corporate governance is the set of internal controls and procedures that governs how a company is run: a framework defining the rights, roles and responsibilities of groups within the organization, aimed at managing and minimizing conflicts of interest among stakeholders. Stakeholder management means understanding stakeholders' interests and communicating with them effectively. Public companies report through annual reports, proxy statements and public notices (performance, related-party transactions, executive pay, governance structure); transparency reduces information asymmetry. Private companies have lighter reporting requirements and usually give information to their investors directly.

Shareholder mechanisms

- The annual general meeting (AGM) is held after fiscal year-end: audited statements presented, questions answered, votes cast. Corporate law sets when the meeting is held and how shareholders are notified; any shareholder may normally attend, speak and vote. **Proxy voting** is the main shareholder mechanism: a shareholder who does not attend assigns her vote to another person (often a director, a manager or her adviser), either with instructions on each issue or at that person's discretion.
- **Ordinary resolutions**, such as appointing the auditor or electing directors, need a simple majority of votes cast.
- **Extraordinary general meetings** are called for major decisions: changes to the bylaws, mergers and takeovers, special board elections requested by shareholders, and liquidation.
- Activist shareholders, increasingly hedge funds with large stakes, push for change through lawsuits, board seats, shareholder resolutions, a **proxy contest**, or a tender offer for a controlling stake. Shareholders can replace both senior managers and directors when they think performance would improve. The threat of a **hostile takeover** (one management does not support) disciplines management but may prompt takeover defenses such as a **staggered board** or a **poison pill** (rights that let existing shareholders other than the bidder buy extra shares at a low price, diluting the bidder).

Creditor mechanisms

The **bond indenture** sets out bondholders' rights and the issuer's obligations, including **covenants** (required or prohibited actions); bonds may be backed by collateral; a trustee monitors compliance. Creditor committees protect bondholders when the issuer is in distress; some countries require one in bankruptcy, and bondholders may form an ad hoc committee that does not represent every holder but shares their interests.

Board of directors and its committees

The board, which shareholders elect to represent them, is responsible for:

- selecting senior managers, setting their pay and evaluating their performance, and planning management and CEO succession;
- setting the company's strategic direction;
- approving changes in capital structure, significant acquisitions and large investment outlays;
- reviewing company performance and taking corrective action;
- setting up and supervising risk management and internal controls;
- making sure that financial reporting and internal audit are of high quality.

It delegates work to committees but keeps overall responsibility. How many committees a board needs, and how large they are, depends on the scale and complexity of the business; regulation often requires an audit committee.

KEY CONCEPT

Committee

Audit committee

Main responsibilities

Financial reporting and accounting policies; internal controls and internal audit; recommending the external auditor and its fee; remedies from audit findings

Committee	Main responsibilities
Nominating/governance committee	Governance code and board elections; nomination policy and recruiting board candidates; code of ethics and conflict-of-interest policies; monitoring laws and ensuring compliance
Compensation committee / remuneration committee	Recommends pay of directors and senior managers (including the CEO); benefit plans; evaluating senior managers. Should consist of independent directors only (required in many countries), because managers should not evaluate or set their own pay
Risk committee (financial services)	Risk policy and tolerance; enterprise-wide risk management
Investment committee (insurance)	Investment and capital management policies

Audit, compensation and governance committees are often made up only of nonexecutive or independent directors.

Other mechanisms

- *Employees*: labor laws, employment contracts, unions, employee board representatives (some countries), employee stock ownership plans (ESOPs).
- *Customers and suppliers*: contracts; increasingly, social media pressure.
- *Governments*: regulation and regulatory agencies; corporate governance codes (often "comply or explain"); exchange listing requirements.

Common exam traps

- Recommending the external auditor is the audit committee's job. The nominating committee does not do it.
- Routine director elections are ordinary resolutions at the AGM, but a special board election proposed by shareholders is an extraordinary general meeting matter.

LOS 22.c — Risks of poor governance, benefits of good governance

KEY CONCEPT

Poor governance and stakeholder management	Effective governance and stakeholder management
Weak control systems (audits, board oversight); some stakeholders gain at others' expense; accounting fraud or poor recordkeeping	Strong controls and compliance avoid many legal and regulatory risks
Less effective decision making: unmonitored managers choose sub-optimal risk; incentive pay that serves managers	Incentives aligned with shareholders improve operational efficiency

Poor governance and stakeholder management

Related-party transactions benefiting insiders

Legal risk and **reputational risk** from non-compliance and lawsuits

Default risk and bankruptcy from mismanaging creditors' rights

Weaker financial performance and firm value

Effective governance and stakeholder management

Formal conflict-of-interest and related-party policies improve results

Lower default risk and a **lower cost of debt**

Better financial performance and higher company value

Common exam traps

- Related-party transactions are a risk of poor governance. Good governance limits them through formal policies; making such transactions more efficient is not one of its benefits.
- Counting control by the most interested stakeholder group as a benefit. Weak governance lets some stakeholders gain at the expense of others; effective governance brings strong control and monitoring through audits and board oversight.

EXAM SHORTCUTS

- Match the symptom to the conflict: too little risk-taking, copying competitors or projects that depend on the manager's own knowledge point to entrenchment, excessive risk-taking points to option-heavy pay, and unnecessary acquisitions point to pay tied to company size.

BOTTOM LINE

- A principal-agent conflict arises when an agent's interests differ from the principal's, and its agency costs are direct, such as monitoring, or indirect, such as business lost.
- Shareholders are the principals and managers and directors their agents; typical conflicts are insufficient effort, the wrong risk appetite, empire building, entrenchment and self-dealing, and information asymmetry makes them harder to monitor.
- Controlling shareholders may act against minority shareholders, and a dual-class structure gives one class more votes than its economic claim, which CFA Institute opposes.
- Because creditors' upside is capped, shareholders may want more business risk, and new debt or larger dividends can shift value from creditors to shareholders, a risk greatest for long-term debtholders.
- Corporate governance is the set of internal controls and procedures defining the rights, roles and responsibilities of groups within a company to manage conflicts among stakeholders, and proxy voting is the main shareholder mechanism.
- Ordinary resolutions such as electing directors or appointing the auditor need a simple majority of votes cast, while bylaw changes, mergers, special board elections and liquidation go to extraordinary general meetings.

- The audit committee recommends the external auditor and oversees reporting and internal controls, and the compensation committee should consist of independent directors only, since managers should not set their own pay.
- Poor governance brings weak controls, related-party transactions, legal, reputational and default risk, while effective governance improves efficiency, lowers default risk and the cost of debt, and raises performance and company value.

QUICK CHECK

Question 1

Between which two parties associated with a company does a principal-agent relationship *most likely* exist?

- A Its customers and its suppliers.
- B Its directors and its regulators.
- C Its shareholders and its managers.

Answer: C

In a principal-agent relationship one party hires another to act on its behalf. Shareholders (the principals), acting through the board of directors, hire managers (the agents) to run the company in the shareholders' best interests.

Why the other options are wrong

- **A.** Customers and suppliers deal with the company under contracts; neither hires the other to act on its behalf.
- **B.** Regulators oversee companies to enforce laws. Directors are not agents hired by regulators; they are agents of the shareholders.

Key takeaway Shareholders = principals; managers and directors = agents. Their differing interests create agency costs.

Practice questions

Question 2

Ridgeway Partners, a hedge fund, has built a 7% stake in Almont Paper and has started a proxy contest to replace three directors. Ridgeway's main aim is *most likely* to:

- A keep the current board and management in place.
- B reduce Almont's debt to protect its bondholders.
- C increase the value of Almont's shares.

Question 3

The board of Castleford Water is drafting the charter of its new audit committee. Which of the following duties should be assigned to a different board committee instead?

- A Overseeing the financial reporting process and the application of accounting policies.
- B Reviewing the effectiveness of internal controls and of the internal audit function.
- C Overseeing the company's corporate governance code, including board elections.

Answers: 2. C · 3. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/principal-agent-problem/. The full bank has 16 questions on this reading.

credguild.com

CORPORATE FINANCE · READING 23

Cash Conversion Cycle

What you'll learn

LOS 23.a Explain the cash conversion cycle ($\text{DOH} + \text{DSO} - \text{DPO}$), what lengthens or shortens it, the cost of trade credit, and compare CCCs across issuers.

LOS 23.b Explain liquidity, primary and secondary liquidity sources, drags and pulls on liquidity, the cost of liquidity, and the current, quick and cash ratios.

LOS 23.c Describe working capital objectives and compare conservative, moderate and aggressive approaches to financing working capital, and factors affecting short-term funding.

MODULE 23.1

Liquidity Measures and Management

This reading explains the cash conversion cycle and its components, the cost of trade credit and measures of working capital, and how to compare issuers on them. It then covers primary and secondary sources of liquidity, drags and pulls on liquidity, liquidity ratios, and conservative, moderate and aggressive approaches to managing working capital.

LOS 23.a — The cash conversion cycle

The **cash conversion cycle (CCC)**, also called the **net operating cycle**, measures how long a company's cash is tied up between paying for inventory and other resources and collecting cash from the resulting sales:

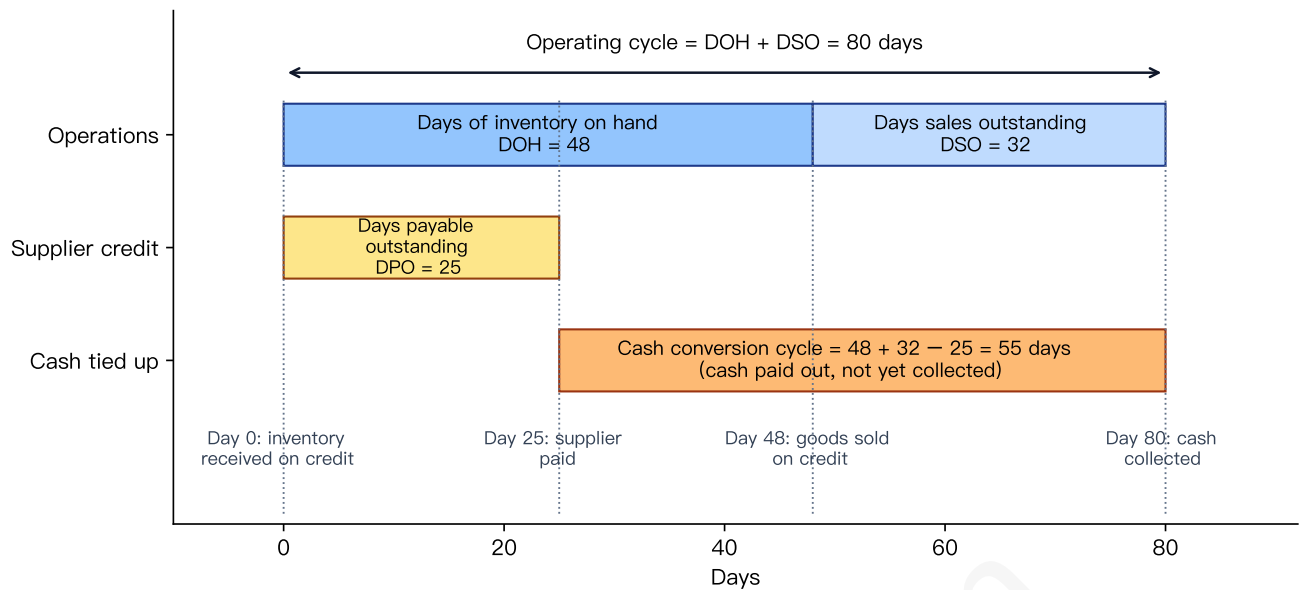
KEY CONCEPT

$$\text{CCC} = \text{DOH} + \text{DSO} - \text{DPO}$$

- **Days of inventory on hand (DOH):** how long inventory is held before it is sold;
- **Days sales outstanding (DSO):** how long customers take to pay (average days of receivables);
- **Days payable outstanding (DPO):** how long the company takes to pay its suppliers (average days of payables).

The **operating cycle** is the time from receiving materials to collecting cash from the sale, so it equals $\text{DOH} + \text{DSO}$. Suppliers finance the first DPO days of it, so the CCC is the part of the operating cycle that the company must finance itself.

Example. $\text{DOH} = 48$, $\text{DSO} = 32$ and $\text{DPO} = 25$ give an operating cycle of 80 days and a CCC of 55 days, as the timeline shows.



Operating cycle and cash conversion cycle on a timeline (DOH 48, DSO 32, DPO 25 days)

From turnover ratios to days. Activity data are often given as turnover ratios, so convert them to days first (365-day year):

1. $DOH = 365 / \text{inventory turnover}$, where $\text{inventory turnover} = \text{cost of goods sold} / \text{average inventory}$;
2. $DSO = 365 / \text{receivables turnover}$, where $\text{receivables turnover} = \text{revenue} / \text{average receivables}$;
3. $DPO = 365 / \text{payables turnover}$, where $\text{payables turnover} = \text{cost of goods sold (many analysts use purchases)} / \text{average trade payables}$;
4. $CCC = DOH + DSO - DPO$.

Example. Inventory turnover of 6.0, receivables turnover of 9.125 and payables turnover of 7.3 give $DOH = 365 / 6.0 = 60.8$, $DSO = 365 / 9.125 = 40.0$ and $DPO = 365 / 7.3 = 50.0$ days. The operating cycle is 100.8 days and the CCC is $60.8 + 40.0 - 50.0 = 50.8$ days. A higher turnover means fewer days.

A lower CCC is generally better: less capital is tied up in working capital and cash is generated faster. A CCC that is high relative to peers may signal excessive investment in working capital and possible cash flow strain.

Change	Effect on CCC
DOH ↑ (slower inventory turnover)	↑
DSO ↑ (slower collection, looser customer credit)	↑
DPO ↓ (suppliers tighten terms, demand faster payment)	↑
DOH ↓, DSO ↓ or DPO ↑	↓

Because the CCC is a linear combination of its components, scaling every component by the same factor scales the CCC by that factor. A percentage change in one component is not the percentage change in the CCC. In the timeline example, if DPO rises from 25 to 35 days (the firm negotiates longer supplier terms), the CCC falls to 45 days: DPO rose 40%, but the CCC fell about 18%.

A company can shorten its CCC by working on any of the three components, but each lever has a cost:

Lever	How the CCC is shortened	Cost or risk
DOH ↓	Hold less raw material and finished goods	Production bottlenecks if supplies are disrupted; unable to meet spikes in demand
DSO ↓	Tighten the credit given to customers	Lost sales
DPO ↑	Take longer to pay suppliers	Early-payment discounts are given up (see the cost of trade credit below)

Trade credit and its cost

Accounts payable are an **implicit source of credit** from suppliers (bank loans are an explicit source). Terms **a/b net c** mean a discount of a (a percentage) if paid within b days, otherwise the full amount is due by day c . Skipping the discount is borrowing $(1 - a)$ per \$1 of invoice for $(c - b)$ days at a cost of a :

KEY CONCEPT

$$\text{EAR of supplier financing} = \left(1 + \frac{a}{1 - a}\right)^{365/(c-b)} - 1$$

where a is the discount as a decimal, b the days until the discount expires and c the days until full payment is due.

Example. Terms 1/10 net 40, bank rate 7%. $\text{EAR} = (1 + 0.01/0.99)^{365/30} - 1 \approx 13.0\% > 7\%$, so borrow from the bank and take the discount.

Comparing CCCs

CCCs differ by industry. Pharmaceutical firms, for example, carry large inventories (long CCC); airlines collect cash before providing the service and hold little inventory (short CCC). Compare a firm with its own industry or with its own history. Scale working capital by sales to compare firms of different size, and compare only firms in similar lines of business, because the ratio varies by industry. A company with a short CCC ties up less working capital for each unit of sales, so the two measures usually point the same way. Analysts often prefer net working capital, built from operating items only, because it ties closely to the CCC:

$$\text{total working capital} = \text{current assets} - \text{current liabilities}$$

$$\text{net working capital} = (\text{current assets} - \text{cash and marketable securities}) - (\text{current liabilities} - \text{short-term and current debt})$$

Example. Current assets of 645 are cash and marketable securities 55, receivables 260, inventory 310 and prepaid expenses 20. Current liabilities of 485 are accounts payable 290, accrued expenses 45, short-term notes 120 and the current portion of long-term debt 30. Total working capital = $645 - 485 = 160$. Net working capital = $(645 - 55) - (485 - 150) = 590 - 335 = 255$.

Common exam traps

- Adding DPO to the operating cycle. Supplier credit shortens the CCC, so DPO is subtracted. In the timeline example, $48 + 32 + 25 = 105$ days instead of 55.
- A CCC can be negative. With prepaid sales and little inventory, the firm collects from customers before it pays suppliers, so supplier credit funds its operations.
- For net working capital, remove only cash and marketable securities from current assets and only short-term and current debt from current liabilities. Receivables, prepaid items, accounts payable and accrued expenses stay in.

LOS 23.b — Liquidity

Liquidity of an asset is its nearness to cash; of a liability, its nearness to settlement. Inventory is less liquid than receivables (it must be sold, then collected).

Current assets ranked by nearness to cash

Current asset	What must happen before it becomes cash	Liquidity
Cash	Nothing	Highest
Marketable securities	Sell them in the market	Very high
Accounts receivable	Collect from customers	Lower
Inventory	Process (if needed) and sell, then collect the receivable	Lowest

For an issuer, liquidity is the availability of cash and liquid assets to meet short-term obligations. Long-term solvency depends on generating enough cash from the business to service liabilities, and analysts judge liquidity management mainly from the statement of cash flows. Companies normally rely on primary sources and turn to secondary sources only when needed.

Primary liquidity sources

Cash and marketable securities on hand
Bank borrowings (e.g., credit lines)
Cash generated by the business

Secondary liquidity sources

Suspending dividends
Delaying or reducing capital investment
Selling assets; issuing equity
Renegotiating/restructuring debt; filing for bankruptcy protection

Secondary sources are costlier and send a negative signal to the market. Cash buffers cost money (idle capital) but reduce the risk of having to rely on secondary sources when the CCC deviates from normal (seasonality, demand shocks).

- A **drag on liquidity** delays cash *inflows*: slow-moving or obsolete inventory (DOH ↑), slow or uncollectible receivables (DSO ↑).
- A **pull on liquidity** accelerates cash *outflows*: suppliers cut credit lines or demand faster payment (DPO ↓).

The **cost of liquidity** is the discount to fair value accepted when assets must be sold quickly. *Example.* \$50 of cash (0% cost), \$150 of receivables and inventory sold at a 10% discount, and \$200 of equipment sold at a 25% discount give proceeds of $50 + 135 + 150 = \$335$ against a fair value of \$400; cost = $\$65 = 16.25\%$.

Liquidity ratios

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

$$\text{quick ratio} = \frac{\text{cash and marketable securities} + \text{receivables}}{\text{current liabilities}}$$

$$\text{cash ratio} = \frac{\text{cash and marketable securities}}{\text{current liabilities}}$$

A current ratio above 1 means current assets are enough to cover current liabilities. The **quick ratio** excludes **inventories**, the least liquid current asset, so it is more conservative than the **current ratio**; the **cash ratio** also excludes receivables and is the most stringent. *Example.* With cash 30, receivables 50, inventory 90 and current liabilities 100, the current ratio is 1.70, the quick ratio 0.80 and the cash ratio 0.30.

Common exam traps

- Classing delayed capital expenditure or suspended dividends as primary sources. Firms turn to them only under pressure, so they are secondary sources.
- Suppliers cutting credit lines is a pull on liquidity, not a drag, even though it lengthens the CCC just as slow collections do.
- Leaving receivables out of the quick ratio. Only the cash ratio excludes them. In the ratio example, $30/100 = 0.30$ instead of 0.80.

LOS 23.c — Managing working capital and liquidity

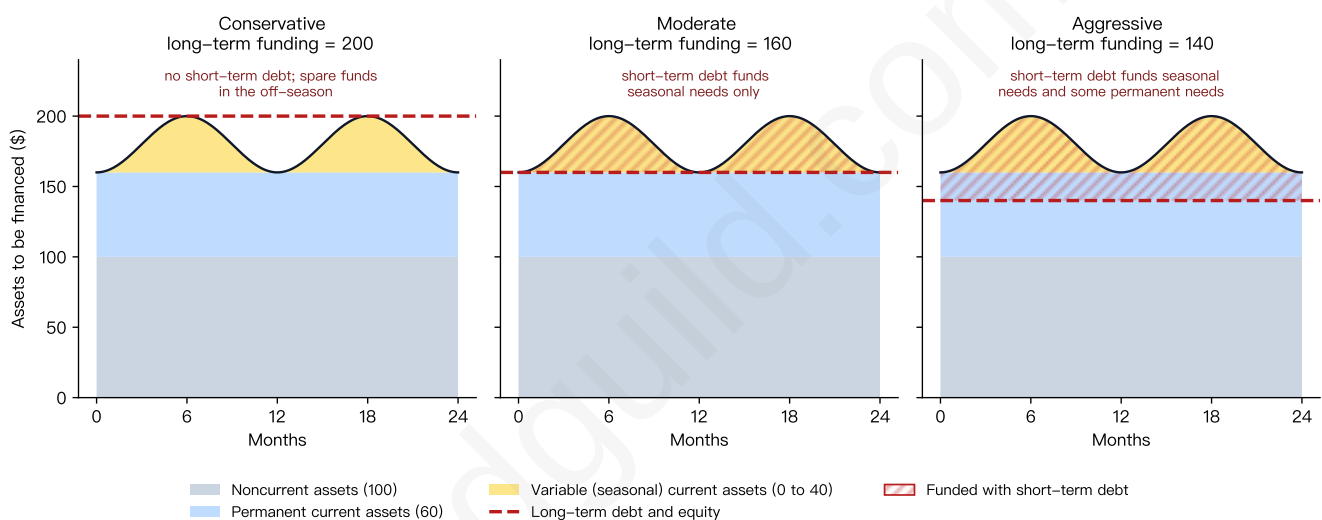
Working capital management tries to maximize profit while keeping enough liquidity to run the business and meet obligations. Holding more short-term assets is safer but earns less; financing with short-term debt is cheaper than long-term debt or equity but carries **rollover risk**. Compare firms by scaling short- and long-term assets by sales.

KEY CONCEPT

	Conservative approach	Moderate approach	Aggressive approach
Short-term assets held	High (relative to long-term assets)	Middle	Low
Financing of working capital	Long-term debt and equity	Permanent current assets: long-term; variable (seasonal) current assets: short-term	Short-term debt

	Conservative approach	Moderate approach	Aggressive approach
Benefits	Permanent capital, little rollover need; flexibility in market disruptions; high probability of meeting short-term obligations	Balance	Lower financing costs, higher returns
Costs / risks	Higher costs, lower profitability; long-term lenders may impose covenants (e.g., minimum interest coverage)	Balance	Risk of failing to meet obligations; vulnerable to market disruptions

Permanent current assets are the level of current assets the business needs all year; **variable (seasonal) current assets** are the extra amount needed at peak times. For the same assets, the approaches differ in how far long-term debt and equity reach up this stack of needs; the rest is funded short term:



Funding the same seasonal working capital needs under the conservative, moderate and aggressive approaches

Factors in choosing short-term funding: company size (small firms have fewer options), creditworthiness, the legal system (lender protections), regulation (e.g., banks and utilities), and the underlying assets available as collateral. Firms should keep several funding sources, know their costs, and arrange them before they are needed.

Common exam traps

- Treating long-term funding of recurring needs such as inventory, wages and rent as the moderate approach. Funding all working capital long term is conservative; the moderate approach funds only permanent needs long term and seasonal needs short term.

EXAM SHORTCUTS

- Compare the EAR of skipping the discount with the bank rate: if the EAR is higher, borrowing from the bank to take the discount is cheaper.

- Scaling every CCC component by the same factor scales the CCC by that factor, but a percentage change in one component is not the CCC's percentage change, so recompute the CCC in days.

BOTTOM LINE

- The cash conversion cycle is $CCC = DOH + DSO - DPO$; the operating cycle is $DOH + DSO$, and the CCC is the part of it the company must finance itself.
- With a 365-day year, DOH, DSO and DPO equal 365 divided by inventory turnover, receivables turnover and payables turnover.
- A lower CCC is generally better; it rises with DOH or DSO and falls with DPO, and each lever has a cost: production bottlenecks, lost sales or forgone early-payment discounts.
- Forgoing a discount on terms a/b net c costs $(1 + a/(1 - a))^{365/(c-b)} - 1$ per year.
- CCCs vary by industry, so compare a firm with its industry or its own history; net working capital removes cash and marketable securities and short-term and current debt, which ties it closely to the CCC.
- Primary liquidity sources are cash and marketable securities, bank borrowings and cash generated by the business, while secondary sources such as suspending dividends, delaying capital investment or selling assets are costlier and send a negative signal.
- A drag on liquidity delays inflows (higher DOH or DSO), a pull accelerates outflows (lower DPO), and the quick ratio excludes inventories while the cash ratio also excludes receivables.
- A conservative approach holds more short-term assets financed long term, an aggressive approach holds fewer financed with short-term debt, and a moderate approach funds permanent current assets long term and seasonal ones short term.

QUICK CHECK

Question 1

The CFO of Brightwater Distributors wants to shorten the company's cash conversion cycle (CCC). Which of the following changes would achieve this goal?

- A Days sales outstanding increases.
- B Days payable outstanding decreases.
- C Days of inventory on hand decreases.

Answer: C

The CCC equals DOH plus DSO minus DPO and measures how long cash is tied up in inventory and receivables before it returns from sales. Selling inventory faster lowers DOH and therefore shortens the CCC.

$$CCC = DOH + DSO - DPO$$

A lower DOH shortens the CCC; a higher DSO or a lower DPO lengthens it.

Why the other options are wrong

- **A.** Slower collection of receivables raises DSO and lengthens the CCC.

- **B.** Paying suppliers sooner lowers DPO; because DPO is subtracted, the CCC gets longer.

Key takeaway CCC falls when DOH or DSO falls, or when DPO rises.

Practice questions

Question 2

Kellan Foods buys ingredients from a supplier that offers terms of 3/15, net 75. Kellan can also borrow from its bank at an annual rate of 9%. Which source of financing is cheaper for Kellan?

- A** Borrowing from the bank.
- B** Forgoing the discount and using the supplier's credit.
- C** The two sources cost the same.

Question 3

Talbridge Electronics' main component suppliers have cut the trade credit line they extend to it and now require payment within 15 days instead of 45 days. For Talbridge, this development is *best* described as a:

- A** drag on liquidity.
- B** pull on liquidity.
- C** secondary source of liquidity.

Question 4

Three companies describe how they handle their working capital. Whose practice fits a conservative approach *best*?

- A** A distributor pays its warehouse rent and staff wages with rolling 90-day bank loans.
- B** A manufacturer keeps far more long-term assets than short-term assets relative to its sales.
- C** A retailer finances its inventory with a ten-year term loan.

Answers: 2. A · 3. B · 4. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/cash-conversion-cycle/. The full bank has 22 questions on this reading.

CORPORATE FINANCE · READING 24

NPV vs IRR

What you'll learn

LOS 24.a Describe the four types of capital investments (going concern, regulatory/compliance, expansion, other) and the analysis each requires.

LOS 24.b Describe the capital allocation process; calculate and interpret NPV, IRR and ROIC and contrast their use in capital allocation.

LOS 24.c Describe the principles of capital allocation (after-tax incremental cash flows, sunk and opportunity costs, externalities, timing) and common pitfalls.

LOS 24.d Describe the types of real options relevant to capital investments: timing, abandonment, expansion, flexibility and fundamental options.

MODULE 24.1

Capital Investments and Project Measures

This reading classifies capital investments, sets out the capital allocation process, and calculates and compares NPV, IRR and ROIC. It then covers the principles for estimating a project's cash flows, common capital allocation pitfalls, and the real options that can add value to a project.

LOS 24.a — Types of capital investments

A **capital investment** is spending on long-lived assets whose cash flows arrive over more than one year. Capital investments fall into four groups, which differ mainly in how much analysis they need. The first two keep the existing business running; the last two aim to grow it and need the most analysis.

KEY CONCEPT

Type	Purpose	Typical depth of analysis
Going concern projects	Keep the existing business running, or cut costs in it (e.g., replace a worn or obsolete but still usable machine with a cheaper-to-run model)	Low: maintenance spending needs little analysis; efficiency (replacement) decisions need a cost comparison
Regulatory/compliance projects	Required by a government agency or an insurer, often for safety or environmental reasons	Moderate: the firm must do it, so the analysis compares alternative ways of carrying it out; the project itself brings in little to no revenue
Expansion projects	Grow the business: new markets or new products in the current market	High: needs forecasts of demand, revenues and expenses
Other projects	Investments outside existing lines of business (start-up-like ventures, buying a firm in a new industry)	High: great uncertainty, risk of overpaying in acquisitions

For pure maintenance spending the only questions are whether to keep the existing operations going and, if so, whether to keep the current processes.

Two further points:

- Firms often use **match funding**: financing a project with sources whose life matches the project's life, which reduces financing risk.
- Analysts often use annual **depreciation expense** as a rough estimate of the capital spending a firm needs just to maintain its business (going concern spending).

Common exam traps

- Little or no revenue is not a reason to reject a regulatory/compliance project.
- Replacing a machine that still works, to lower operating costs, is a going concern project, not an expansion project, even though it involves buying new equipment.

LOS 24.b — The capital allocation process, NPV, IRR and ROIC

The process

Capital allocation is the process of identifying and evaluating capital projects, meaning projects whose cash flows are received over a period longer than one year. The same framework can be applied to any corporate decision that affects future earnings. It matters because the assets are costly and long-lived, because the same thinking applies to other decisions (working capital, mergers and acquisitions), and because good capital allocation serves management's primary goal of maximizing shareholder value.

The four administrative steps are:

1. **Idea generation**: the most important step; ideas come from senior management, divisions, employees or outsiders.
2. **Analyzing project proposals**: forecast each project's cash flows to judge its profitability.
3. **Creating the firm-wide capital budget**: rank and schedule profitable projects given cash flow timing, available resources and the firm's strategy; a project that looks attractive alone may not fit the strategic plan.
4. **Monitoring decisions and conducting a post-audit**: compare actual with forecast results; the **post-audit** exposes systematic forecasting errors and pushes managers to improve operations.

Arranging the financing for projects is not one of these four steps.

Net present value (NPV)

The **net present value (NPV)** adds up the present values of all the expected incremental after-tax cash flows of a project, discounted at the project's required rate of return (the firm's cost of capital adjusted for project risk):

KEY CONCEPT

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n} = \sum_{t=0}^n \frac{CF_t}{(1+r)^t}$$

where CF_0 is usually a negative initial outlay. **Decision rule** for independent projects: accept if $NPV > 0$ (expected to increase shareholder wealth), reject if $NPV < 0$. A zero-NPV project is expected to leave shareholder wealth unchanged. In theory, accepting a project raises the firm's value by its NPV, so the share price rises by the NPV per share.

Example. A company with 40 million shares trading at \$25 announces a project that costs \$90 million; the present value of its after-tax inflows is \$96 million. If investors had not expected the project and accept these estimates, $NPV = 96 - 90 = \$6$ million, or $6/40 = \$0.15$ per share, so the price rises to \$25.15.

Internal rate of return (IRR)

The **internal rate of return (IRR)** is the discount rate at which the inflows and the outflows have equal present values, i.e., the rate at which $NPV = 0$:

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

Decision rule: accept if $IRR >$ required rate of return (the **hurdle rate**), reject if $IRR <$ hurdle rate. The required rate is usually the firm's cost of capital, raised or lowered when the project is riskier or safer than the firm's average project. Because NPV falls as the discount rate rises, the two rules agree for a conventional independent project:

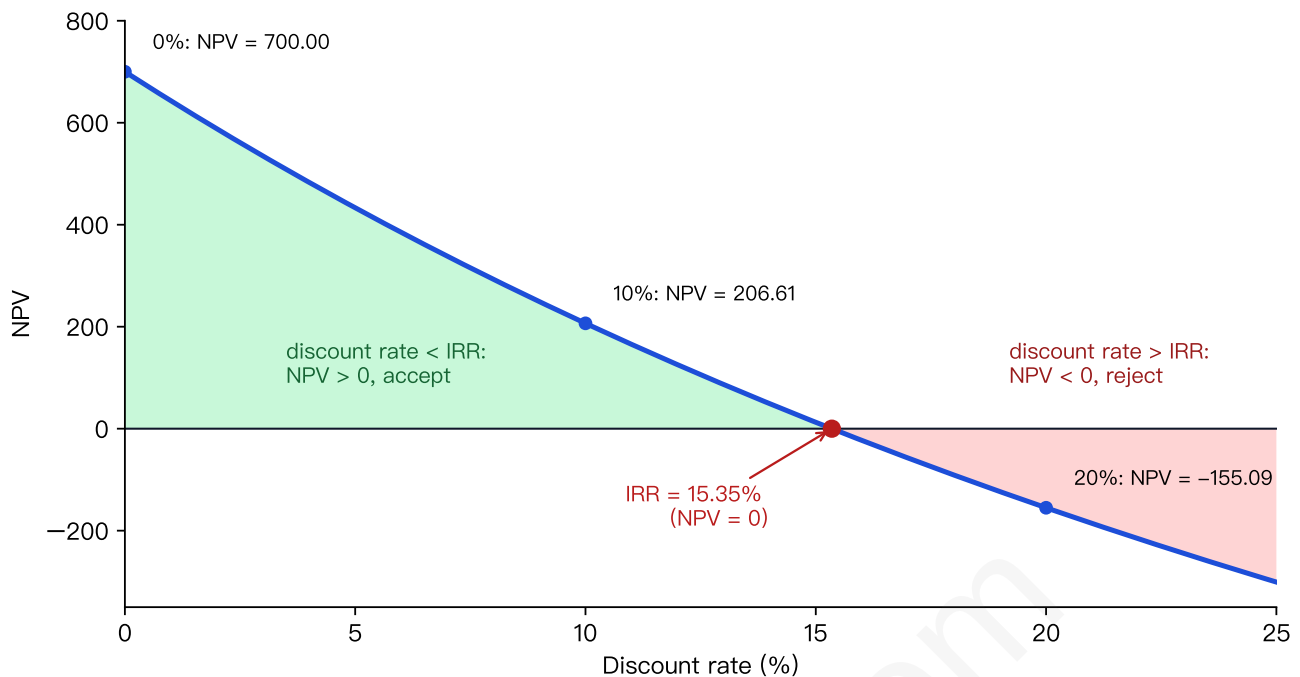
Discount rate used vs. IRR	Sign of NPV
Discount rate < IRR	$NPV > 0$
Discount rate = IRR	$NPV = 0$
Discount rate > IRR	$NPV < 0$

Example. A project costs 2,000 and returns 700, 900 and 1,100 at the ends of years 1–3; the required return is 10%.

$$NPV = -2,000 + \frac{700}{1.10} + \frac{900}{1.10^2} + \frac{1,100}{1.10^3} = -2,000 + 636.36 + 743.80 + 826.45 = 206.61$$

Calculator (TI BA II Plus): [CF] [2ND][CLR WORK]; CF0 = -2,000; C01 = 700, F01 = 1; C02 = 900, F02 = 1; C03 = 1,100, F03 = 1; [NPV] I = 10, [↓][CPT] = 206.61; [IRR][CPT] = 15.35%. Both rules say accept ($NPV > 0$ and $15.35\% > 10\%$).

The figure plots this project's NPV at discount rates from 0% to 25%; it shows the table above as a curve.



NPV of the example project (outlay 2,000; inflows 700, 900, 1,100) at different discount rates

Calculator tips for uneven cash flows

- Use the frequency registers (F01, F02, ...) for repeated equal cash flows.
- A year with no cash flow must be entered as a cash flow of 0; skipping it shifts every later cash flow one year too early.
- If a sale (or clean-up cost) happens in the same year as an operating cash flow, net them into one cash flow for that year; entering the sale as an extra period puts it one year too late.

Conventional vs. unconventional cash flows

A **conventional cash flow pattern** changes sign once (outflow(s) followed by inflows). An **unconventional cash flow pattern** changes sign more than once, e.g., an outflow at the end for decommissioning. Cash flows spaced at uneven time intervals are also treated as unconventional. Spreadsheets handle both cases best.

NPV vs. IRR

KEY CONCEPT

	NPV	IRR
Main advantage	Direct measure of the expected increase in firm value	A percentage return; shows the margin of safety (how far the return can fall before NPV turns negative)
Reinvestment assumption	Interim cash flows reinvested at the required rate of return (more realistic)	Interim cash flows reinvested at the IRR

NPV

Unconventional
cash flows

No problem

IRR

Possible **multiple IRRs** that are hard to
interpret

Return on invested capital (ROIC)

Return on invested capital (ROIC) measures, for the firm as a whole, the after-tax operating return on all capital (debt and equity):

$$ROIC = \frac{NOPAT}{\text{average book value of invested capital}} = \underbrace{\frac{NOPAT}{\text{Sales}}}_{\text{operating margin after tax}} \times \underbrace{\frac{\text{Sales}}{\text{average invested capital}}}_{\text{capital turnover}}$$

Net operating profit after tax (NOPAT) = net income + after-tax interest expense = $NI + \text{interest} \times (1 - t)$.

Invested capital is the average book value of the firm's **total capital**, the debt and equity that finance it. Exam convention: invested capital is long-term debt plus equity, and working capital is left out of it, meaning non-interest-bearing current liabilities such as accounts payable are not counted as capital. Current practice: debt and equity finance receivables and inventory as well as fixed assets, so operating working capital is not subtracted from capital; invested capital is usually total interest-bearing debt, including short-term borrowings, plus equity, often net of excess cash. The ratio of sales to invested capital is also called **asset turnover**, so a firm can raise ROIC by improving its after-tax operating margin or by turning over its capital faster. If ROIC exceeds the investors' blended required return, the firm is adding value over time.

Example. Net income 18m, interest expense 5m, tax rate 20%, sales 275m. Long-term debt plus equity is 190m at the start of the year and 210m at the end. $NOPAT = 18 + 5(0.80) = 22\text{m}$; average invested capital = $(190 + 210)/2 = 200\text{m}$; $ROIC = 22/200 = 11\% = (22/275) \times (275/200) = 8\% \times 1.375$.

ROIC is attractive to outside investors because it uses published accounting data and applies to the whole firm, which is what they can buy. However, it is not comparable across different accounting treatments, it is backward-looking and volatile, and good projects can hide bad ones in the company-wide figure. NPV and IRR are project-specific.

Common exam traps

- NPV is the PV of inflows minus the initial outlay. The PV of inflows alone is a common wrong answer. In the three-year example, the PV of the inflows alone is 2,206.61 instead of an NPV of 206.61.
- Do not add unadjusted (undiscounted) cash flows. In the three-year example, $-2,000 + 700 + 900 + 1,100 = 700$ instead of 206.61.
- For NOPAT, add back interest after tax; adding the full pretax interest overstates NOPAT. In the ROIC example, $18 + 5 = 23\text{m}$ gives an ROIC of 11.5% instead of 11%.

EXAM SHORTCUTS

- For a conventional independent project, NPV is positive exactly when the discount rate is below the IRR, so once the IRR is compared with the required return the sign of the NPV is known.

BOTTOM LINE

- Capital investments are going concern, regulatory/compliance, expansion and other projects, and the last two, which aim to grow the business, need the most analysis.
- The capital allocation process is idea generation (the most important step), analysis of proposals, the firm-wide capital budget, and monitoring with a post-audit that exposes systematic forecasting errors.
- NPV is the sum of a project's incremental after-tax cash flows discounted at its required rate of return, $\sum CF_t/(1+r)^t$, and an independent project is accepted when $NPV > 0$.
- The IRR is the discount rate at which $NPV = 0$, an independent project is accepted when the IRR exceeds the hurdle rate, and for a conventional independent project the NPV and IRR rules agree.
- NPV measures the expected increase in firm value and assumes reinvestment at the required return, while the IRR assumes reinvestment at the IRR and can give multiple values for unconventional cash flows.
- $ROIC = NOPAT \div \text{average invested capital} = \text{after-tax operating margin} \times \text{capital turnover}$, with $NOPAT = \text{net income} + \text{interest} \times (1 - t)$; under the exam convention invested capital is long-term debt plus equity excluding working capital, while current practice usually counts all interest-bearing debt plus equity.

QUICK CHECK**Question 1**

Tamsin Foods is reviewing three capital projects. Which one would typically need the *most* detailed analysis?

- A** Replacing a packaging machine that still works with a newer model that costs less to run.
- B** Launching a new product line in a region where the company does not yet sell.
- C** Installing fire-suppression equipment that the company's insurer now requires.

Answer: B

An expansion project that brings a new product into a new market requires forecasts of demand, revenues and expenses that are all highly uncertain. It therefore needs the most detailed analysis of the three.

Why the other options are wrong

- **A.** Replacing a usable machine to lower costs is a going concern project. It needs a cost comparison, but its cash flows are much easier to estimate than those of a new product in a new market.
- **C.** Insurer-mandated safety equipment is a regulatory/compliance project. The firm must do it, so the analysis centers on comparing alternative ways of complying.

Key takeaway Depth of analysis rises with uncertainty. Projects that maintain the business need little analysis, regulatory/compliance projects call for comparing alternative ways to comply, and expansion and other projects need the most detailed analysis.

MODULE 24.2

Capital Allocation Principles and Real Options

LOS 24.c — Principles of capital allocation and common pitfalls

Principles

- Decisions are based on cash flows rather than accounting income, because accounting income is built on accruals and ignores when cash is received or paid. The cash flows are measured after tax, since the firm's value rests on the cash it keeps rather than the cash it pays in taxes. Tax savings from non-cash deductions such as depreciation and amortization are part of the cash flows.
- Only incremental cash flows count: the cash flows that change because the project is accepted.
 - Sunk costs** are *excluded*. These are amounts already spent that cannot be recovered whatever the decision.
 - Opportunity costs** are *included*. An opportunity cost is the value of the best alternative use of a resource the project will use, such as rent forgone on a building the firm owns.
 - Effects on the rest of the firm are *included*: **cannibalization** is a negative effect in which the new product takes sales from an existing product, as when a "light" version of an existing snack is launched; a **positive externality** is an increase in sales of other product lines (e.g., a printer maker adding a scanner that lifts sales of its cables).
- The timing of cash flows is important: money received sooner is worth more (time value of money).
- Financing costs are not deducted from the cash flows; they are reflected in the project's **required rate of return**, the rate used to discount the cash flows. Subtracting interest as well would count the cost of financing twice.

KEY CONCEPT

Item	Include in project cash flows?
Sunk cost	No
Opportunity cost	Yes
Cannibalization (negative externality)	Yes (as a reduction)
Positive externality	Yes
Tax effects, including depreciation tax savings	Yes
Interest on financing	No; captured in the discount rate

Common pitfalls

Cognitive errors (calculation errors):

- Poor forecasting**, for example misallocating overhead or ignoring how competitors will respond.
- Not considering the cost of internal funds**: retained earnings are not free; their cost is the cost of equity (they could have been paid out as dividends). Firms reluctant to pay dividends risk spending retained earnings on poor projects.

- **Incorrectly accounting for inflation:** real cash flows need a real discount rate; nominal with nominal.

Behavioral biases (errors of judgment):

- **Pet projects** of senior management get optimistic forecasts and less scrutiny.
- **Inertia in setting the entire capital budget:** anchoring each year's budget to last year's rather than to the opportunities available; a warning sign is a static or rising budget alongside falling returns. A value-focused firm returns surplus cash to shareholders when positive-NPV projects are scarce and argues for a bigger budget when they are plentiful.
- **Basing investment decisions on EPS or ROE:** managers paid on short-term EPS or ROE may pass up positive-NPV projects that depress those ratios early on.
- **Failure to generate alternative investment ideas:** stopping at the first "good" idea instead of looking for a better one.

Common exam traps

- A consulting or research fee paid *before* the decision is a sunk cost even if it was paid "for" the project.
- Cannibalization is counted even though the lost sales belong to another product line. The test is whether the firm's total cash flows change.
- Depreciation is not itself a cash flow, but the tax it saves is. Leave out the depreciation charge and include the tax saving.

LOS 24.d — Real options

Real options are future actions a firm may take because it invested in a project today. Like financial options, they give the right but not the obligation to act. Because the firm will simply not exercise an option whose exercise would destroy value, a real option can never have a negative value; at worst it is worth zero.

KEY CONCEPT

Real option	What it lets management do	Example
Timing options	Delay an investment to wait for better information	Postpone building a plant until a pilot's results are known
Abandonment options	Exit a project when the PV of the cash flows from exiting exceeds the PV of continuing	Close a loss-making branch and sell its equipment
Expansion options (also called growth options)	Make further investments later if they will create value	Buy land next to a new plant so capacity can be doubled later
Flexibility options: price-setting options and production-flexibility options	Change operating decisions: raise prices when demand is high; use overtime, switch input materials or produce a different variety of product	A bakery line that can switch between two flours depending on cost

Real option	What it lets management do	Example
Fundamental options	The project itself is an option because its payoff depends on the price of an underlying asset	A gold mine that is opened when the gold price is high and closed when it is low

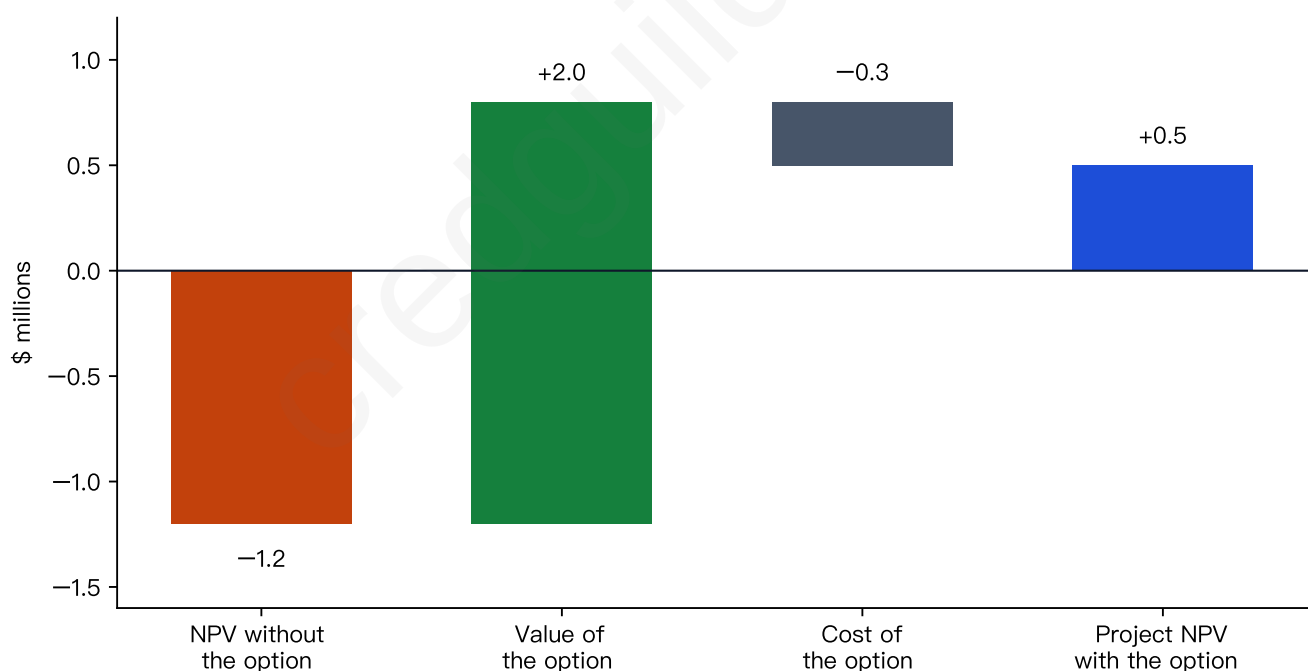
Valuing a project with real options. One approach is:

KEY CONCEPT

$$\text{Project value} = NPV_{\text{without options}} + \text{value of options} - \text{cost of options}$$

using option pricing models or decision trees. Another is to treat the NPV without options as the project's minimum value. If that minimum is already positive, the project can be accepted without valuing its options, because an option can only add value.

Example. A project's NPV on its own is -1.2m . Paying 0.3m now for an option to expand later adds an estimated 2.0m of option value. Adjusted NPV $= -1.2 + 2.0 - 0.3 = +0.5\text{m}$, so the project with the option is worth doing.



Building up project NPV with a real option (numbers from the example)

Common exam traps

- Buying rights now that let the firm invest in *future* projects (sequels, extra capacity, a second phase) = expansion option.

- Paying overtime or switching inputs is a flexibility option, not an expansion option: it changes how the existing project runs rather than adding a new investment.
- A resource project undertaken because the commodity price is high = fundamental option.

EXAM SHORTCUTS

- Test each cost by asking whether the firm's total cash flows change if the project is accepted: amounts already spent are sunk and excluded, while forgone rent, cannibalized sales and extra sales of other products are included.
- If a project's NPV without options is already positive, it can be accepted without valuing its real options, because an option can only add value.

BOTTOM LINE

- Capital allocation uses after-tax incremental cash flows rather than accounting income, including the tax savings from depreciation and amortization.
- Sunk costs are excluded, while opportunity costs, cannibalization and positive externalities are included in project cash flows.
- Financing costs are reflected in the required rate of return and are not also deducted from the project's cash flows.
- Cognitive errors include poor forecasting, ignoring the cost of internal funds (the cost of equity) and mixing real and nominal terms, while behavioral biases include pet projects, inertia in the capital budget, decisions based on EPS or ROE and failure to generate alternatives.
- Real options give the right but not the obligation to act and so never have negative value; they include timing, abandonment, expansion, flexibility (price-setting and production-flexibility) and fundamental options.
- A project with real options is worth its NPV without options plus the value of the options minus their cost.

QUICK CHECK

Question 2

For the past eight years, Farrow Plastics' capital budget has been set at roughly the prior year's amount plus 3%, even though the returns on its recent projects have been falling. This practice is best described as which capital allocation pitfall?

- A Failure to generate alternative investment ideas.
- B Pet projects of senior management.
- C Inertia in setting the entire capital budget.

Answer: C

Anchoring each year's capital budget to the prior year's, rather than to the positive-NPV opportunities actually available, is the behavioral bias of inertia. A budget that stays the same or keeps rising while returns fall is the usual warning sign. A firm focused on shareholder value would return excess funds

when good projects are scarce.

Why the other options are wrong

- **A.** This bias is stopping at the first acceptable idea without searching for better ones. It concerns which projects are proposed rather than how the size of the budget is set.
- **B.** Pet projects are individual projects backed by influential executives that get optimistic forecasts and little scrutiny. Nothing in the scenario points to a favored project.

Key takeaway A static or steadily rising capital budget combined with declining returns signals inertia (anchoring to last year's budget).

Practice questions

Question 3

Harwick Instruments has estimated that a proposed sensor line has an internal rate of return of 11.5% and a net present value of +\$1.9 million. The company's 9.0% cost of capital is appropriate for the risk of the line. Harwick should *most likely*:

- A** reject the line, based on both its NPV and its IRR.
- B** accept the line, but only on the basis of its NPV.
- C** accept the line, based on both its NPV and its IRR.

Question 4

Fenmoor Packaging earns an operating margin after tax of 8.0%, and its sales are 1.5 times its invested capital. The blended rate of return that its debt and equity investors require is 10.0%. Which statement about Fenmoor is *most accurate*?

- A** Its ROIC is 5.3%, so it is losing value over time.
- B** Its ROIC is 8.0%, so it is losing value over time.
- C** Its ROIC is 12.0%, so it is adding value over time.

Question 5

Kinloss Cold Storage is evaluating a refrigerated warehouse that would cost \$8.20 million today. Discounted at Kinloss's required rate of return, the warehouse's expected after-tax cash flows have a present value of \$7.65 million. For an additional \$0.45 million paid now, Kinloss can buy the adjoining parcel of land, which would allow it to double the warehouse's capacity later if demand justifies it. Using a decision tree, Kinloss's analysts value this expansion option at \$1.30 million. The NPV of the warehouse project including the expansion option is *closest to*:

- A** +\$0.30 million.
- B** -\$0.55 million.
- C** -\$1.00 million.

Answers: 3. C · 4. C · 5. A

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/npv-vs-irr/. The full bank has 35 questions on this reading.

credguild.com

CORPORATE FINANCE · READING 25

Modigliani Miller

What you'll learn

LOS 25.a Calculate and interpret a company's weighted-average cost of capital using after-tax cost of debt and target (market) weights.

LOS 25.b Explain internal, external and life-cycle factors that affect capital structure, debt capacity and the WACC.

LOS 25.c Explain the Modigliani–Miller propositions on capital structure, without and with taxes, and the role of costs of financial distress.

LOS 25.d Describe optimal and target capital structures: static trade-off theory, deviations from target, asymmetric information, agency costs and pecking order theory.

MODULE 25.1

Weighted-Average Cost of Capital

This reading calculates the weighted-average cost of capital and explains the internal and external factors, including the life cycle stage, that shape a company's capital structure. It then sets out the Modigliani–Miller propositions with and without taxes, the costs of financial distress, the static trade-off and pecking order theories, and how a target capital structure is estimated.

LOS 25.a — Calculating and interpreting the WACC

A company's **weighted-average cost of capital (WACC)** is the blended required return of all its capital providers. With debt and common equity only:

KEY CONCEPT

$$WACC = w_d r_d(1 - t) + w_e r_e$$

where w_d and w_e are the weights of debt and equity ($w_d + w_e = 1$), r_d is the **pretax cost of debt**, t is the marginal tax rate, and r_e is the **cost of equity**. If the firm has preferred stock, add $w_p r_p$. Preferred dividends are not tax-deductible, so this term has no tax adjustment.

Key points:

- Debt costs less than equity because debtholders are paid first from the firm's cash flows and have a senior claim on its assets.
- Interest is tax-deductible in most jurisdictions, so the pretax cost of debt is converted to an **after-tax cost of debt**, $r_d(1 - t)$. The cost of equity gets no tax adjustment.
- The weights can be **target weights** or **market value weights**. Market values reflect conditions today, so they are the right basis for measuring today's opportunity cost of capital. LOS 25.d explains how an analyst estimates a target capital structure that the company does not disclose.
- The WACC is the discount rate for computing the NPV of an expansion that mirrors the existing business and is financed in the firm's normal proportions.

Example. A firm's debt has a market value of \$32 million and its equity \$48 million, so $w_d = 32/80 = 0.40$ and $w_e = 48/80 = 0.60$. Its pretax cost of debt is 7%, its cost of equity is 12%, and its tax rate is 21%.

$$WACC = 0.40(0.07)(1 - 0.21) + 0.60(0.12) = 0.02212 + 0.07200 = 9.41\%$$

Common exam traps

- Forgetting the tax adjustment (using r_d instead of $r_d(1 - t)$) overstates the WACC. In the example, $0.40(0.07) + 0.60(0.12) = 10.00\%$ instead of 9.41%.
- Multiplying by t instead of $(1 - t)$ understates it badly. In the example, $0.40(0.07)(0.21) + 0.60(0.12) = 7.79\%$ instead of 9.41%.
- Swapping the weights, or weighting by the debt-to-equity ratio instead of by each source's share of total capital, $D/(D + E)$ and $E/(D + E)$. In the example, swapping them gives $0.60(0.07)(0.79) + 0.40(0.12) = 8.12\%$ instead of 9.41%.

LOS 25.b — Factors affecting capital structure and the WACC

Firms usually aim for the capital structure that minimizes the WACC, and they try to match the maturity of their financing to the life of their assets. The factors that shape capital structure are essentially those that determine a company's **capacity to service debt**.

- **Internal factors:** business and industry characteristics, **life cycle stage**, existing leverage, and the corporate tax rate.
- **External factors:** conditions in the market and the business cycle, regulation, and industry norms.

The corporate tax rate matters because interest is tax-deductible: the higher the rate, the larger the tax saving from each unit of debt.

Features of a company that let it carry more debt:

- Revenue that is growing or stable, and cash flow that is growing and predictable.
- Low **business risk** (operational risk and demand risk).
- Plenty of liquid, **tangible assets** that can be pledged as collateral. Creditors prefer tangible assets that can be sold without much loss of value, or that are fungible, over intangible assets. A firm that owns its productive assets outright has more collateral than one that uses assets owned by others, as in a franchise model.
- Low cost and ready availability of debt.
- Low existing leverage and low earnings volatility. Analysts gauge debt capacity with leverage ratios (debt-to-equity, debt-to-operating profit) and coverage ratios, such as interest coverage = $EBIT / \text{interest expense}$.

Other things equal:

KEY CONCEPT

Supports more debt

Noncyclical industry

Low **operating leverage** (low fixed costs as a share of total costs)

Supports less debt

Cyclical industry

High fixed operating costs

Supports more debt

Subscription-based revenue

Liquid tangible assets owned outright

Supports less debt

Pay-per-use revenue

Mostly intangible assets, or assets owned by others

The life cycle stage shows these factors at work:

KEY CONCEPT

Stage	Cash flows and risk	Typical financing
Start-up	Low or negative earnings and cash flow, high business risk, few assets	Almost all equity; possibly convertible debt (if the share price is rising fast) or leasing
Growth	Rising revenue and cash flow, business risk falling	Some debt, used conservatively, often secured by fixed assets or receivables
Mature	Slower growth, stable and significant cash flow, low business risk	Significant debt, including unsecured debt at relatively low cost

A start-up's debt would be very risky, so lenders would demand high interest rates, and its small base of receivables and fixed assets offers little collateral. **Convertible debt** suits a start-up with a fast-rising share price because it costs less than straight debt and postpones the dilution of existing shareholders.

Top-down factors are macroeconomic conditions (inflation, real GDP growth, monetary policy and exchange rates) that move benchmark rates and credit spreads. In downturns, lenders demand wider spreads, especially from companies in cyclical industries. Some industries benefit from particular conditions; for example, spreads of oil producers tend to narrow when oil prices rise.

Common exam traps

- A start-up is financed almost exclusively with equity, even if it is growing fast.
- High fixed operating costs point to less debt, not more: operating leverage and financial leverage both make earnings more volatile.

BOTTOM LINE

- With debt and common equity only, $WACC = w_d r_d (1 - t) + w_e r_e$, where each weight is that source's share of total capital; preferred stock adds $w_p r_p$ with no tax adjustment.
- Debt costs less than equity because debtholders have a prior claim, and because interest is tax-deductible in most jurisdictions the cost of debt enters the WACC after tax, while the cost of equity does not.
- WACC weights can be target or market value weights, and market values are the right basis for today's opportunity cost of capital.
- The WACC is the discount rate for a project that mirrors the existing business and is financed in the firm's normal proportions.

- Capital structure reflects the capacity to service debt, shaped by internal factors (business characteristics, life cycle stage, existing leverage, tax rate) and external factors (market and business cycle conditions, regulation, industry norms).
- Stable or growing revenue and cash flow, low business risk, low operating leverage and liquid tangible assets owned outright support more debt, so start-ups are financed almost entirely with equity, growth firms use some debt and mature firms significant debt.

QUICK CHECK

Question 1

Harlan Steelworks has no preferred stock. An equity analyst wants a WACC figure that measures Harlan's current opportunity cost of capital, and she has collected these data:

Harlan Steelworks: capital and cost data

Item	Value
Debt, market value	\$175 million
Debt, book value	\$200 million
Common equity, market value	\$525 million
Common equity, book value	\$900 million
Yield to maturity on Harlan's bonds (pretax cost of debt)	5.6%
Cost of common equity	13.2%
Marginal tax rate	25%

Interest expense is tax-deductible. Harlan's WACC is *closest* to:

- A 10.95%.
- B 11.30%.
- C 11.56%.

Answer: A

Market-value weights reflect current market conditions, so they are the right weights for measuring the current opportunity cost of capital. Total capital at market value is $175 + 525 = \$700$ million, so debt is 25% and equity 75%. Because interest is tax-deductible, the cost of debt enters the WACC after tax.

Market-value weights: $w_d = 175/700 = 0.25$; $w_e = 525/700 = 0.75$.

After-tax cost of debt: $5.6\% \times (1 - 0.25) = 4.2\%$.

$$WACC = w_d r_d(1 - t) + w_e r_e = 0.25(4.2\%) + 0.75(13.2\%) = 1.05\% + 9.90\% = 10.95\%$$

Why the other options are wrong

- **B.** 11.30% uses the correct market-value weights but the 5.6% pretax cost of debt: $0.25(5.6\%) + 0.75(13.2\%) = 1.40\% + 9.90\%$. It ignores the tax deductibility of interest.
- **C.** 11.56% weights debt and equity by book values, $200/1,100 = 18.18\%$ and $900/1,100 = 81.82\%$: $0.1818(4.2\%) + 0.8182(13.2\%) = 0.76\% + 10.80\%$. Book values do not reflect current market conditions; here the book value of equity is far above its market value, so book weights overstate the weight of equity, the more expensive source.

Key takeaway For the current cost of capital, weight each source by its market value (or by management's target weights) and use the after-tax cost of debt. Book values can differ sharply from market values, especially for equity.

MODULE 25.2

Capital Structure Theories

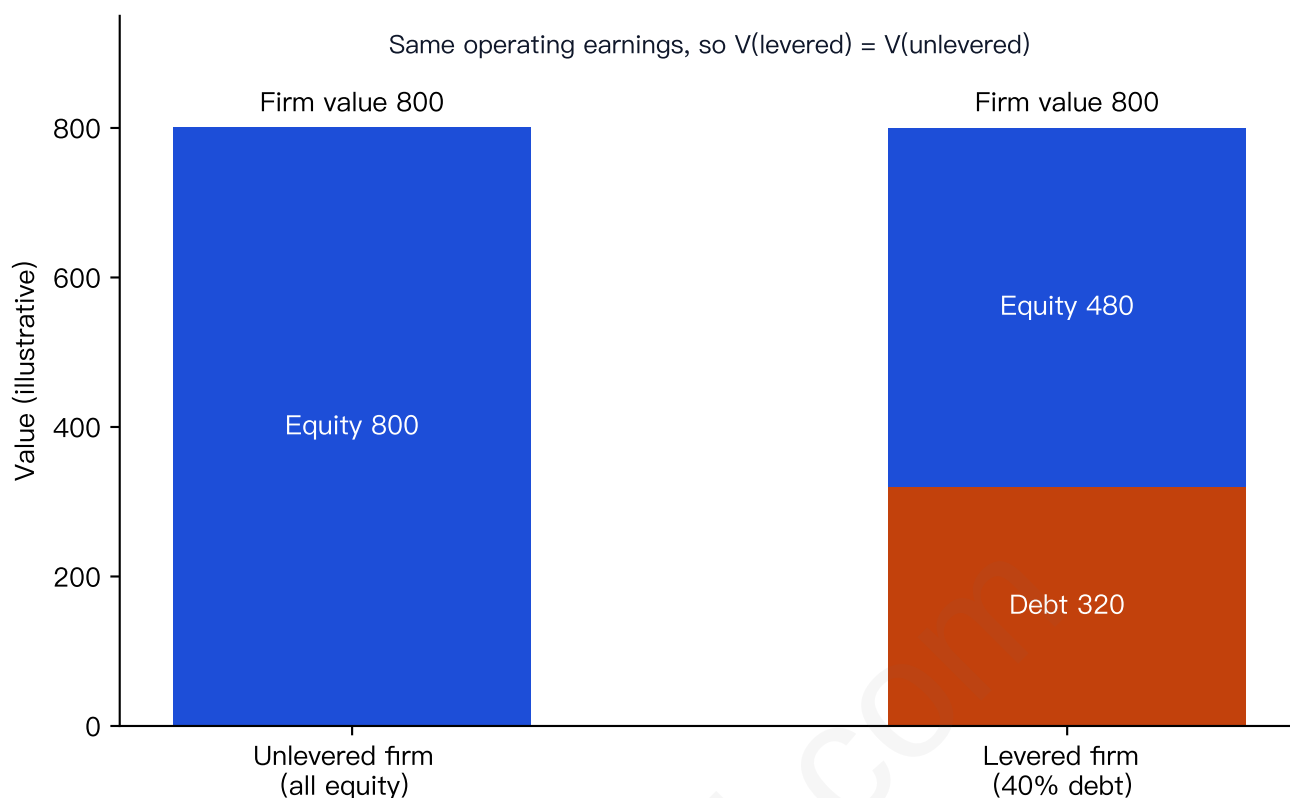
LOS 25.c — The Modigliani–Miller propositions

The assumptions

The capital structure propositions of **Modigliani and Miller (MM)** rest on these assumptions: capital markets are perfectly competitive, with no taxes, transactions costs or bankruptcy costs; all investors hold homogeneous expectations; borrowing and lending are available to investors at the risk-free rate; agency costs are absent; and financing choices have no effect on investment decisions, so the firm's operating income does not depend on its mix of debt and equity.

MM Proposition I (no taxes): capital structure irrelevance

With these assumptions in place, changing the capital structure does not change firm value: $V_L = V_U$, where V_L is the value of the levered firm and V_U the value of an otherwise identical unlevered (all-equity) firm. The size of the "pie" (the value of the firm's operating earnings, EBIT) stays the same however it is divided between debtholders and shareholders. An investor who owned all of the debt and equity of a levered firm would receive the same EBIT as the owner of an identical all-equity firm.



MM Proposition I without taxes: the same firm value under two financing mixes (illustrative numbers)

MM Proposition II (no taxes): cost of equity and leverage

The cost of equity rises linearly with the debt-to-equity ratio. Debtholders have a prior claim, so the residual cash flows left to shareholders become riskier as debt increases:

KEY CONCEPT

$$r_e = r_0 + \frac{D}{E}(r_0 - r_d)$$

where r_e is the cost of equity, r_0 is the cost of equity of the firm if it had no debt (all equity), r_d is the cost of debt and D/E is the debt-to-equity ratio. Promised payments to debtholders are more certain than the residual cash flows to shareholders, so $r_d < r_e$. The formula follows from Proposition I: if the WACC equals r_0 whatever the mix, then $\frac{D}{V}r_d + \frac{E}{V}r_e = r_0$, and solving for r_e gives the line above. r_0 reflects the business risk of the firm's operations, which the financing mix does not change. As D/E rises, the cost of equity rises while the cost of debt stays the same. The benefit of using more low-cost debt is exactly offset by the higher cost of equity, so the WACC is unchanged. This is consistent with Proposition I.

MM with taxes

When interest is tax-deductible, debt creates a **debt tax shield** worth $t \times D$:

$$V_L = V_U + tD$$

With taxes, the government's slice of the pie shrinks as debt rises. Firm value is therefore maximized, and the WACC minimized, at 100% debt. The cost of equity still rises with leverage, but more slowly:

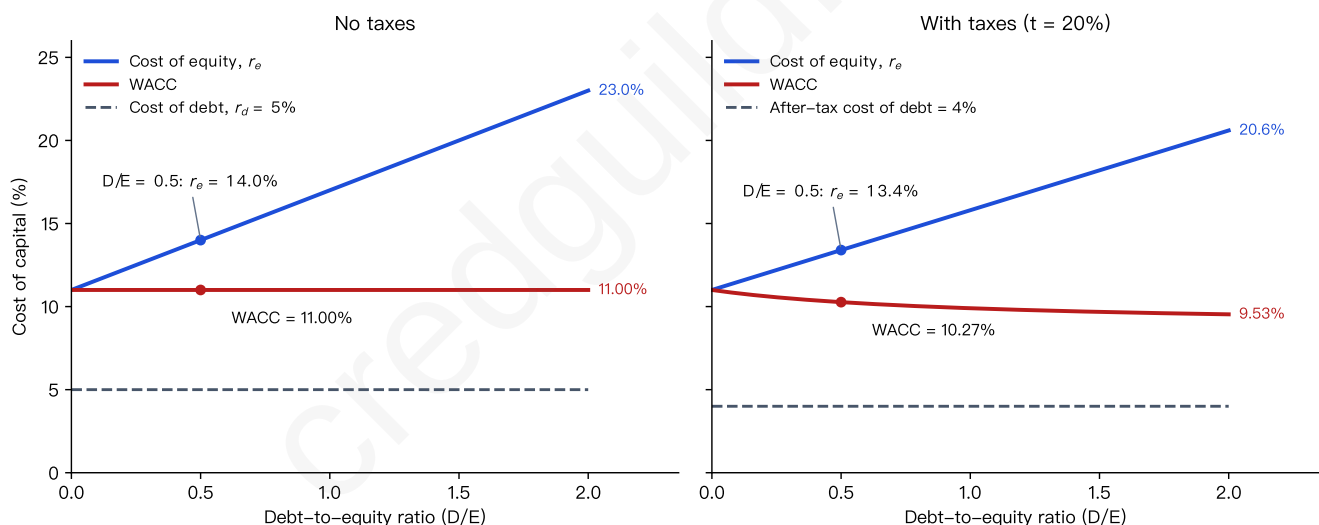
$$r_e = r_0 + \frac{D}{E}(r_0 - r_d)(1 - t)$$

Example. Let $r_0 = 11\%$, $r_d = 5\%$, $D/E = 0.5$ and $t = 20\%$. Without taxes, $r_e = 11\% + 0.5(6\%) = 14.0\%$. With taxes, $r_e = 11\% + 0.5(6\%)(0.8) = 13.4\%$. Separately, an unlevered firm worth 500 that adds 200 of debt at a 25% tax rate is worth $500 + 0.25(200) = 550$ under MM with taxes.

KEY CONCEPT

	MM without taxes	MM with taxes
Firm value	Unaffected by capital structure	Rises with debt; maximum at 100% debt
WACC	Constant	Falls as leverage rises; minimum at 100% debt
Cost of equity	Rises linearly with D/E	Rises with D/E, but less steeply (factor $1 - t$)

The figure draws both cases with the example inputs ($r_0 = 11\%$, $r_d = 5\%$, $t = 20\%$).



MM Proposition II without and with taxes ($r_0 = 11\%$, $r_d = 5\%$, $t = 20\%$)

Costs of financial distress

In practice firms do not use 100% debt or anything close to it. MM themselves suggested that differences in investors' tax rates on dividends and on interest income could help explain observed capital structures. Current theory points instead to a cost the model leaves out, the **costs of financial distress**: the extra costs a firm faces when falling earnings make its fixed financing costs hard to pay. These costs rise with leverage. Expected costs of financial distress have two components:

1. The costs incurred if distress occurs. **Direct costs** are the legal and administrative fees of bankruptcy. **Indirect costs** include forgone investment opportunities and the lost trust of customers, suppliers, creditors and employees. Conflicts between managers (acting for shareholders) and debtholders add the **agency**

costs of debt.

- The **probability of financial distress**, which rises with operating and financial leverage and with weak management and corporate governance.

Other things equal, higher expected costs of financial distress discourage heavy use of debt.

LOS 25.d — Optimal and target capital structures**Static trade-off theory**

The **static trade-off theory** balances the value of the debt tax shield against the expected costs of financial distress:

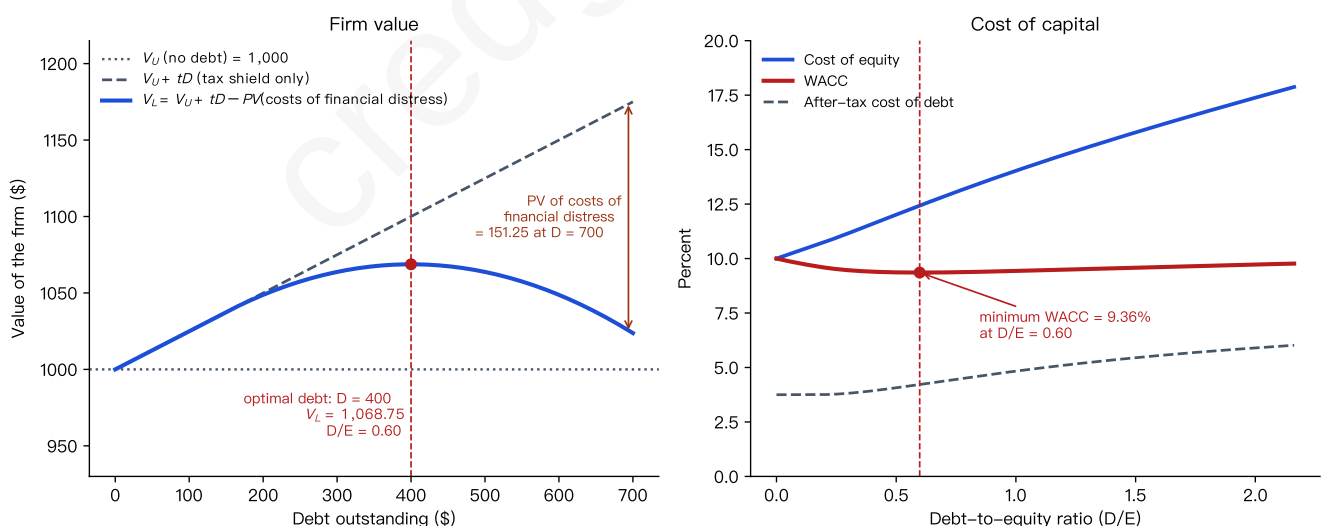
KEY CONCEPT

$$V_L = V_U + tD - PV(\text{costs of financial distress})$$

As debt increases, the tax shield keeps increasing, but beyond some point the extra expected distress costs outweigh the extra tax benefit. The **optimal capital structure** is the debt level at which firm value is maximized and the WACC is minimized. Because V_U is constant, this is also where $V_L - V_U$ is largest.

- Firm value first rises and then falls as leverage increases; the WACC first falls and then rises (a U shape).
- The cost of equity rises throughout as leverage increases.
- The optimum differs across firms. It depends on business risk, the tax rate, corporate governance, industry and other factors.

The figure shows firm value and the costs of capital with illustrative numbers: an unlevered firm worth 1,000, a 25% tax rate and distress costs that start once debt passes 150.



Static trade-off theory: firm value and cost of capital as debt increases (illustrative numbers)

Target capital structure

The **target capital structure** is the mix a firm aims for on average over time, reflecting management's view of the optimal structure. WACC weights should reflect the target, measured at market values. An analyst can use management's stated target when one is given, but most firms do not publish a target, so an external analyst estimates it from (1) the current market-value capital structure, (2) the current structure adjusted for a visible trend, or (3) industry-average weights.

Book values are also common in practice. Analysts often estimate target weights from the book values of debt and equity, and managers often think in book values for three reasons: short-term market swings do not change the appropriate amount of debt, management cares about how capital is deployed to projects, and rating agencies use book values.

Actual capital structures fluctuate around the target because of:

- changes in market values, especially of equity;
- management exploiting opportunities, such as issuing equity after a temporary share-price rise;
- external capital being raised in minimum-size lots.

Deviations caused by these three reasons are a normal part of how an actual capital structure moves around its target.

Asymmetric information, signaling and pecking order theory

Costs of asymmetric information arise because managers know more about the firm's prospects than investors do. They are higher for firms with complex products or opaque financial statements, and they raise required returns on both debt and equity. The larger the share of equity in the capital structure, the higher the cost of asymmetric information. Investors read financing choices as signals. Taking on debt, a commitment to fixed payments, signals confidence; issuing equity is often read as a sign that management believes the shares are overvalued.

Pecking order theory says managers prefer the financing least likely to send a negative signal, ranked by visibility to investors:

1. Internally generated funds (retained earnings), the most preferred source;
2. Debt;
3. New external equity, the least preferred source.

Capital structure is then a by-product of individual financing decisions rather than a deliberate target.

Agency costs of equity

Agency costs of equity stem from conflicts between managers and shareholders. Managers without an ownership stake do not bear the cost of excessive pay or of taking too much or too little risk, so shareholders spend money to limit the conflict. The **net agency costs of equity** that result have three components:

Component	Meaning	Examples
Monitoring costs	Supervising management; lower with strong corporate governance	Reporting to shareholders, board of directors' pay
Bonding costs	Assuring shareholders that managers act in their interest	Insurance premiums guaranteeing performance; implicit costs of noncompete agreements

Component	Meaning	Examples
Residual losses	Losses that remain despite monitoring and bonding	Imperfect guarantees

Under the **free cash flow hypothesis**, more debt reduces agency costs because interest payments leave managers less free cash flow to spend for their own benefit.

Common exam traps

- MM with taxes and no distress costs leads to 100% debt. The static trade-off theory leads to an optimum below 100% debt.
- Bonding and monitoring costs belong to the net agency costs of equity. They are not part of pecking order theory.
- Under pecking order theory debt ranks ahead of new equity even though equity carries no default risk. The ranking follows how visible the source is and how negative a signal it sends, not its cost.

EXAM SHORTCUTS

- Match the theory to its conclusion: MM without taxes makes capital structure irrelevant, MM with taxes points to 100% debt, the static trade-off theory gives an optimum below 100% debt, and pecking order theory has no target, with internal funds used first.

BOTTOM LINE

- The MM propositions assume perfectly competitive markets with no taxes, transactions or bankruptcy costs, homogeneous expectations, borrowing and lending at the risk-free rate, no agency costs, and operating income unaffected by financing.
- Without taxes, MM Proposition I gives $V_L = V_U$, and Proposition II gives $r_e = r_0 + (D/E)(r_0 - r_d)$, so the cost of equity rises with leverage while the WACC is unchanged.
- With taxes, $V_L = V_U + tD$, firm value is maximized and the WACC minimized at 100% debt, and the cost of equity rises more slowly, $r_e = r_0 + (D/E)(r_0 - r_d)(1 - t)$.
- Expected costs of financial distress combine the direct and indirect costs of distress with its probability, which rises with operating and financial leverage and weak management or governance, and they discourage heavy use of debt.
- Under the static trade-off theory $V_L = V_U + tD - PV(\text{costs of financial distress})$, so the optimal capital structure, where firm value is highest and the WACC lowest, lies below 100% debt; analysts without a stated target estimate it from the current market-value structure, its trend or industry averages.
- Pecking order theory ranks internal funds first, then debt, then new external equity, by how visible and negative a signal each sends, and under the free cash flow hypothesis more debt reduces the agency costs of equity.

QUICK CHECK

Question 2

Sorrel Systems would have a cost of equity of 10.5% if it had no debt. The company borrows at 6.0%, has a debt-to-equity ratio of 0.6, and faces a 25% corporate tax rate. Under Modigliani and Miller's Proposition II with taxes, Sorrel's cost of equity is *closest* to:

- A 13.20%.
- B 12.53%.
- C 11.77%.

Answer: B

MM Proposition II says the cost of equity rises linearly with the debt-to-equity ratio. With taxes, the leverage premium is scaled down by $(1 - t)$ because the debt tax shield absorbs part of the extra risk borne by shareholders.

$$\begin{aligned} r_e &= r_0 + \frac{D}{E}(r_0 - r_d)(1 - t) = 10.5\% + 0.6(10.5\% - 6.0\%)(1 - 0.25) \\ &= 10.5\% + 0.6(4.5\%)(0.75) = 10.5\% + 2.025\% = 12.525\% \approx 12.53\% \end{aligned}$$

Why the other options are wrong

- **A.** 13.20% is the no-tax version of Proposition II; it omits the $(1 - t)$ factor.
- **C.** 11.77% uses the debt-to-total-capital ratio ($0.6/1.6 = 0.375$) instead of the debt-to-equity ratio of 0.6.

Key takeaway MM II with taxes: $r_e = r_0 + (D/E)(r_0 - r_d)(1 - t)$. The leverage term uses D/E; using D/V is a common error.

Practice questions

Question 3

Treloar Bakeries' revenue growth has slowed to a few percent a year, its operating cash flow is large and stable, and its business risk is low. Given its life cycle stage, Treloar is *most likely* to be financed with:

- A equity almost exclusively, possibly with some convertible debt.
- B a significant amount of debt, including unsecured debt at relatively low cost.
- C limited debt, used conservatively and secured by receivables or fixed assets.

Question 4

Halvard Retail generates far more cash than it can invest profitably. One of its directors argues that the company should take on more debt, because the required interest and principal payments would leave management with less spare cash to spend on lavish perks and low-return acquisitions. The director's argument is *most* consistent with:

- A pecking order theory.
- B the use of debt to signal management's confidence.
- C the free cash flow hypothesis.

Answers: 3. B · 4. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/modigliani-miller/. The full bank has 28 questions on this reading.

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CORPORATE FINANCE · READING 26

Business Models

What you'll learn

LOS 26.a Describe the key features of a business model: customers, product, channels, pricing strategy, key assets and suppliers, value proposition and value chain.

LOS 26.b Describe types of business models, including private label manufacturing, licensing, value-added resellers, network effects and crowdsourcing.

MODULE 26.1

Business Model Features and Types

This reading sets out the key features of a business model (its customers, product, key assets and suppliers, channels and pricing) together with the value proposition and value chain. It then describes conventional and other types of business models, including private label manufacturing, licensing, value-added resellers, network effects and crowdsourcing.

LOS 26.a — Key features of business models

A **business model** explains how a firm provides a product or service, finds customers, delivers to them and makes a profit. A useful checklist asks *who, what, how, where* and *how much*:

KEY CONCEPT

Question

What the model should cover

Who: customers

The target customers (**segmenting** the market into customer groups), how they are acquired, the cost of acquiring them, and how satisfaction is monitored and kept

What: product or service

The need it meets and what differentiates it from competitors (low price, premium quality, innovative features)

How: key assets and suppliers

The assets that matter (patents, software, skilled staff) and the critical suppliers

Where: channels

Where and how the firm sells and delivers, which is its **channel strategy**

How much: pricing

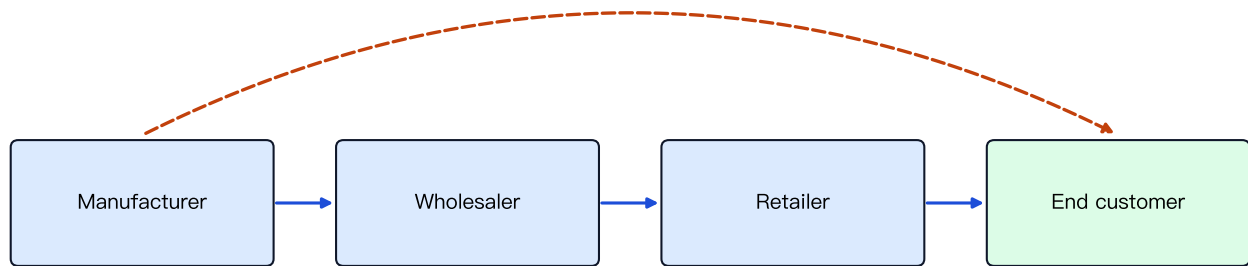
The **pricing strategy** and why buyers will pay that price given the competition

The model describes how the firm works and earns money. Detailed forecasts of revenues and expenses belong in a financial plan rather than in the business model.

Channel strategy

The **channel strategy** covers how the firm sells (online, physical stores, direct mail, trade shows, sales representatives), whether it sells directly to buyers (**direct sales**) or through intermediaries (wholesalers, retailers, agents, franchisees), and how it delivers the product. A strategy that combines digital and physical channels, such as ordering online and collecting in store, is an **omnichannel strategy**.

Direct sales: the manufacturer sells to the end customer (online, own stores, sales force)



Traditional channel: the product is sold and bought at each stage, through intermediaries

A traditional channel through intermediaries compared with direct sales

Firms selling to other businesses are **B2B** (business to business) firms; firms selling to consumers are **B2C** (business to consumer) firms.

Pricing strategies

Commodity producers with undifferentiated products are **price takers**, so premium pricing does not fit their business model. Firms with few competitors or highly differentiated products have **pricing power**. Added services or features that customers value can support a premium price.

Price discrimination means charging different prices to different customers or groups of customers. The common forms are:

- **Tiered pricing:** the price depends on the volume purchased, with lower unit prices for larger orders.
- **Dynamic pricing:** the price varies with when the purchase is made, for example the hour or the weekday (peak and off-peak prices, or cheap airfares on flights at very early or very late hours).
- **Value-based pricing:** the price is set by the value customers perceive in the product, such as a premium for a new drug that protects slightly better than existing ones.
- **Auction pricing:** buyers bid.

Pricing models for multiple products:

KEY CONCEPT

Model	How it works	Example
Bundling	Complementary products sold together at one price	A hotel room priced with breakfast and parking included
Razors-and-blades	Equipment sold at a low price and margin; profit made on consumables used with it	A coffee machine sold cheaply, with profits from the capsules
Add-on pricing	Core product sold at a normal margin; high-margin options added after the purchase decision	A sofa with pricey fabric protection and an extended warranty offered at checkout

Other pricing models:

Model	How it works
Penetration pricing	Low margins (even losses) for a period to build market share and scale
Freemium pricing	Basic product free; extra functionality sold or unlocked for a fee
Hidden revenue	Product is free to the user; revenue comes from advertisers or from selling user data

Two models offer alternatives to outright purchase. Under the **subscription model**, customers pay regularly for access, as with software sold as a monthly subscription. Under **licensing and franchising**, a firm lets others produce or sell its product. A biotech firm may license a new drug to an established drug maker that already has a sales force. A **franchisee** sells in a set area and pays the franchisor a share of sales in return for product and marketing support.

Value proposition and value chain

A firm's **value proposition** is how customers will value the characteristics of its product or service, given competing products and their prices. The **value chain** is how the firm *executes* that value proposition: its assets and organization, and how they add value and exploit its competitive advantage through product quality and functionality, included service, the sales process and pricing relative to competitors. Michael Porter's value chain analysis names five activities a firm should execute well. Exam convention: inbound logistics, operations, outbound logistics, marketing, and sales and service. Current practice: Porter's own list groups the last two as marketing and sales, and service; the first three activities are the same in both.

Example. A meal-kit company's value proposition is "restaurant-quality dinners at home in 20 minutes for less than takeout." Its value chain consists of the sourcing contracts, the packing centers, the refrigerated delivery network and the recipe team that deliver on that promise.

Common exam traps

- A discount is not automatically tiered pricing. A discount for buying at off-peak times is dynamic pricing; only a discount tied to the quantity bought is tiered pricing.
- A free product is not automatically freemium pricing. If no paid version exists and all revenue comes from advertisers or user data, the model is hidden revenue.
- Timing separates add-on pricing from bundling: add-ons are offered after the customer has decided to buy, while a bundle is priced as one package from the start.
- "Direct sales" describes the channel strategy, and "B2B" or "B2C" describes the customers. Neither is a pricing strategy.

LOS 26.b — Types of business models

Conventional business models are largely industry-specific: manufacturers, distributors and retailers, natural resource producers, banks and brokers, software firms and service providers. Other common models:

KEY CONCEPT

Business model	Description
Private label manufacturers (contract manufacturers)	Make products that other companies sell under their own brand names, such as a store brand
Licensing agreements	A company lets another company use its brand on that company's products for a fee
Value-added resellers	Resell complex equipment together with installation, service, support or customization

Business model innovation often comes from new entrants that use new technology to challenge incumbents. Examples are **software as a service (SaaS)**, ultra-low-cost airlines and discount brokers.

Network effects are the increase in a network's value as its user base grows, as with messaging apps, online marketplaces and social media. Network effects favor an initial penetration pricing strategy to build the user base quickly, and they exploit both size and scope. A network can be two-sided or multi-sided, as with a platform that matches travelers with hosts.

Crowdsourcing models benefit from users' contributions, such as articles for an online encyclopedia, traffic reports for a navigation app, or code for open-source software.

Common exam traps

- A manufacturer that makes goods for a retailer's own brand is a private label (contract) manufacturer. In a licensing agreement, the brand is what is rented out.
- A value-added reseller adds services such as installation and support to equipment it resells. It does not manufacture the equipment.
- A platform that needs enough users on each side (drivers and riders, hosts and guests) relies on network effects. Crowdsourcing is different: there users contribute content or improvements.

EXAM SHORTCUTS

- Classify a price difference by what triggers it: the quantity bought means tiered pricing, the time of purchase means dynamic pricing, and the value customers perceive means value-based pricing.
- For a free product, a paid upgrade means freemium pricing and revenue from advertisers or user data means hidden revenue; for extras, options offered after the purchase decision mean add-on pricing, while a package priced from the start is bundling.

BOTTOM LINE

- A business model covers who the customers are, what the product is, how the firm operates (key assets and suppliers), where it sells (channels) and how much it charges, while detailed revenue and expense forecasts belong in a financial plan.
- The channel strategy covers how the firm sells, whether directly or through intermediaries, and how it delivers; an omnichannel strategy combines digital and physical channels, and B2B or B2C describes the customers.

- Commodity producers are price takers, firms with few competitors or highly differentiated products have pricing power, and price discrimination takes the forms of tiered, dynamic, value-based and auction pricing.
- Pricing models include bundling, razors-and-blades and add-on pricing for multiple products, penetration, freemium and hidden-revenue models, and subscription, licensing and franchising as alternatives to outright purchase.
- The value proposition is how customers value the product given competing products and prices, and the value chain is how the firm executes it; the exam convention lists Porter's activities as inbound logistics, operations, outbound logistics, marketing, and sales and service, while Porter's own list groups the last two as marketing and sales, and service.
- Besides industry-specific conventional models, firms can be private label (contract) manufacturers, license their brand to others for a fee, or act as value-added resellers that add installation, service or customization to complex equipment.
- Network effects raise a network's value as its user base grows and favor initial penetration pricing, while crowdsourcing models benefit from content or improvements contributed by users.

QUICK CHECK

Question 1

An analyst is writing up the business model of Seabrook Outfitters. Which of the following items is *least likely* to belong in the description of the business model?

- A Detailed forecasts of revenue and expenses for the next five years.
- B The customer groups the company targets and how it reaches them.
- C The key assets and critical suppliers the company relies on.

Answer: A

A business model explains how a firm provides its product, finds and serves customers, and makes a profit: who the customers are, what is offered, how and where it is delivered, and how it is priced. Detailed forecasts of revenue and expenses belong in a financial plan, not in the business model.

Why the other options are wrong

- B. Target customers and how they are acquired and kept are core parts of a business model.
- C. The assets and suppliers that matter to the firm are part of how the business model works.

Key takeaway Business model = who, what, how, where and how much; detailed financial forecasts belong to the financial plan.

Practice questions

Question 2

A laptop maker has sold a premium keyboard, a high-resolution display and three years of on-site support as separate options. For its next model it decides to stop selling them separately and to include all three with the laptop for one combined base price. Which pricing model *best* reflects this decision?

- A Value-based pricing.
- B Bundling.
- C Dynamic pricing.

Question 3

Fairfield Mills produces breakfast cereals that are sold only under the store brands of several large supermarket chains. Fairfield's name does not appear on any package. Which business model *best* describes Fairfield Mills?

- A Value-added reseller.
- B Licensing agreement.
- C Private label manufacturer.

Answers: 2. B · 3. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/corporate-finance/business-models/. The full bank has 15 questions on this reading.

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