CFA 一级知识框架图

Corporate Finance

专业来自101%的投入！

Framework

SS10: Corporate Finance (1)	R33: Corporate Governance and ESG: An Introduction R34: Capital Budgeting R35: Cost of Capital
SS11: Corporate Finance (2)	R36: Measures of Leverage R37: Working Capital Management

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Corporate Governance and ESG: An Introduction

Stakeholder theory & board of directors and committees

Corporate governance	
定义	**Corporate governance** is the **internal system** including checking, balancing and incenting various parties, which could minimize and manage the conflicting interests between insiders and shareholders.
Corporate governance theory	**Shareholder theory** takes the view that the most important responsibility of a company's managers is to maximize shareholder returns.
	Stakeholder theory broadens a company's focus beyond the interests of only its shareholders to its customers, suppliers, employees, and others who have an interest in the company.

Stakeholder theory & board of directors and committees	
Various stakeholder groups' interests	
Shareholders	Growth in corporate profitability to maximize a company's value
Managers and employees	Interest in company's viability
Board of directors	Experienced individuals that fulfill responsibility toward shareholders and company
Creditors	Stability of company's operation and performance
Suppliers	Company's ability to generate cash flow to meet its financial obligations
Customers	Satisfy their needs with a given price and safety standards Company's stability
Governments/regulators	Protect the interest of general public, and ensure well-being of their nation's economies

Stakeholder theory & board of directors and committees	
Conflict interests	**Reasons**
Principal–agent	➢ Shareholder with diversified investment portfolios may have a relatively high risk tolerance ➢ "Information asymmetry" ➢ Board is influenced by insiders ➢ Influential shareholders over other shareholders
Controlling and minority shareholder	➢ Straight voting leaves minority shareholders less representation on the board ➢ Controlling shareholders' decision might have impact on minority shareholder's wealth

Stakeholder theory & board of directors and committees	
Conflict interests	**Reasons**
Shareholder and creditor	➢ Difference risk tolerance
Customers and shareholders	➢ High price and reduce costs
Customers and suppliers	➢ Credit terms
Shareholders and governments or regulators	➢ E.G. accounting policy to reduce tax burden ➢ E.G. bank's shareholders prefer a lower equity capital base while regulators prefer a higher capital position

Stakeholder theory & board of directors and committees

General management	➢ Communication and active engagement ➢ Balance their interests and limit the impact of conflicts
Stakeholder management frameworks	➢ Legal infrastructure ➢ The contractual infrastructure ➢ The organizational infrastructure ➢ The governmental infrastructure
Mechanisms	➢ General meetings ➢ Board of director mechanisms ➢ The audit function ➢ Reporting and transparency ➢ Policies on related-party transactions ➢ Remuneration policies ➢ Say on pay ➢ Employee laws and contracts ➢ Contractual agreements with customers and suppliers ➢ Laws and regulations

Stakeholder theory & board of directors and committees

Board of directors	
Composition factors	➢ Company size ➢ Structure ➢ Complexity of operations
Types	➢ One tier ➢ Two tier ➢ Staggered boards
Functions and responsibilities	➢ Duty of care and the duty of loyalty ➢ Board directors are elected by shareholders ➢ Ensures leadership continuity ➢ Board delegate activities to management- implement strategies ➢ Board evaluate performance-aligns ➢ Company's audit and control systems ➢ Corporate governance principles ➢ Risk management system

Stakeholder theory & board of directors and committees	
Committees	
Audit committee	➢ Independent auditor (internal & external)
Nominations committee	➢ Nomination procedures and policies
Remuneration / compensation committee	➢ Appropriate executive compensation packages ➢ Reasonable option schemes
Governance committee	➢ Corporate governance code
Risk committee	➢ Risk policy, profile, and appetite ➢ Establishes ERM
Investment committee	➢ Investment strategy and policies

Corporate governance and ESG	
Market factors that affect stakeholder relationships and corporate governance	
Shareholder engagement	Annual shareholder meeting and analyst calls
	In order to build support against short-term activist investors
Competitive dynamics	Help align managerial interests with those of its stakeholders
	Preservation of employment status against takeover
Shareholder activism	Maximize shareholder value
	Strategies used by shareholders to attempt to compel a company to act in a desired manner

Corporate governance and ESG	
Non-market factors that affect stakeholder relationships and corporate governance	
Legal environment	The key difference between the two systems lies in the ability of a judge to create laws
The media	Powerful tool to influence corporate matters
The corporate governance industry	External corporate governance services

Corporate governance and ESG	
Potential risks and benefits of corporate governance	
Risks of poor governance	➢ Weak control systems ➢ Ineffective decision making ➢ Legal, regulatory, and reputational ➢ Default and bankruptcy risks
Benefits of effective governance	➢ Operational efficiency ➢ Improved control ➢ Better operating and financial performance ➢ Lower default risk and cost of debt

Corporate governance and ESG

Dual-class structures

定义	Voting power is decoupled from ownership Common shares may be divided into two classes, one of which has superior voting rights to the other
类型	➢ A common arrangement is when a share class carries one vote per share and is publicly traded whereas another share class carries several votes per share and is held exclusively by company insiders or family members. (e.g. Facebook) ➢ Another mechanism used to separate voting control from economic ownership is when one class of stock (held by insiders) elects a majority of the board. (e.g. Alibaba)

Corporate governance and ESG

Other considerations

- Economic ownership and voting control **(dual-class structures)**
- Board of directors representation
- Remuneration and company performance
- Investors in the company
- Strength of shareholders' rights
- Managing long-term risks

Corporate governance and ESG

ESG considerations	
ESG definition	➢ The practice of considering environmental, social, and governance factors in the investment process is known as ESG integration
ESG integration	➢ Sustainable investing (SI) and responsible investing ➢ Socially responsible investing (SRI) ➢ Impact investing
ESG factors in investment analysis	➢ Environment factor ➢ Social factor ➢ Governance factor
ESG implementation methods	➢ Negative screening ➢ Positive screening ➢ The best-in-class approach ➢ Thematic investing strategies ➢ Impact investing

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Capital Budgeting

The basic of capital budgeting

Capital budgeting 概念

Capital budgeting process	➢ Generating ideas ➢ Analyzing individual proposals ➢ Planning capital budget ➢ Monitoring and post-audit	**Classification of capital project** ★★	➢ Replacement projects ➢ Expansion projects ➢ Mandatory investment ➢ Other projects

Basic principles

➢ **Based on cash flows**	Incremental cash flows Ignore: sunk costs & financing costs Include: externalities & opportunity costs

➢ **Timing of cash flows is crucial**

➢ **Cash flows are analyzed on an after tax basis**

有限资本下选择project

Capital rationing

Independent projects	Mutually exclusive projects

NPV & IRR

	公式	筛选	Advantages	Disadvantages
NPV ★	$NPV=CF_0+\frac{CF_1}{1+r}+\frac{CF_2}{(1+r)^2}+\cdots\cdots+\frac{CF_n}{(1+r)^n}$	➢ 独立项目：NPV>0， ➢ 互斥项目：选NPV最大的项目投资	➢ Shows gains as currency amount ➢ +NPV adds value to the firm rather than creditors ➢ Includes opportunity costs	➢ Ignores the size of the projects
IRR ★	$0=CF_0+\frac{CF_1}{1+IRR}+\frac{CF_2}{(1+IRR)^2}+\cdots\cdots+\frac{CF_n}{(1+IRR)^n}$	➢ 独立项目：IRR>cost of capital ➢ 互斥项目：最高IRR	➢ Reflects the profitability (%)	➢ Reinvestment at IRR ➢ No IRR & multiple IRRs
当NPV、IRR冲突，选NPV为标准				

PBP, DPBP

	公式	筛选	Advantages	Disadvantages
PBP	PBP=full year until recovery +(unrecovered cost/cash flow)	➢ 独立项目：PBP<benchmark PBP ➢ 互斥项目：最短PBP	➢ Simple ➢ An indication of a project's risk and liquidity	➢ Ignores time value of money ➢ Ignores cash flows after the payback period ➢ Ignores project profitability
DPBP	PBP=full year until recovery +(unrecovered cost/discounted cash flow)	➢ 独立项目：DPBP< benchmark DPBP ➢ 互斥项目：最短DPBP	➢ An indication of a project's risk and liquidity ➢ Considers time value of money	➢ Ignores cash flows after the payback period ➢ Ignores project profitability

PI				
	公式	**筛选**	**Advantages**	**Disadvantages**
PI	$PI=\frac{\text{PV of future cash flow}}{\lvert CF_0 \rvert}$ $=1+\frac{NPV}{\lvert CF_0 \rvert}$	➢ 独立项目：PI>1 ➢ 互斥项目：选PI最大的项目投资	➢ Measures profitability of the project	➢ Not reflect the absolute amount of profit gain of the project

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Cost of Capital

WACC

$$WACC(\text{weighted average cost of capital}) = (w_d)[r_d(1-t)] + (w_{ps})(r_{ps}) + (w_e)(r_e)$$

w_d = the proportion of debt that the company uses when it raises new funds
r_d = the before-tax marginal cost of debt
t = the company's marginal tax rate
w_{ps} = the proportion of preferred stock the company uses when it raises new funds
r_{ps} =the marginal cost of preferred stock
w_e = the proportion of equity that the company uses when it raises new funds
r_e = the marginal cost of equity

应该用project risk对应的折现率	➢ If a project's risk>firm's risk→NPV overestimated if using WACC ➢ If a project's risk<firm's risk→NPV underestimated if using WACC

Cost of the different sources of capital

After–tax cost of debt （$r_d(1-t)$ ）

Yield to maturity approach

计算器计算:
N= the number of payment periods remaining to maturity
PMT_t= coupon payment in period t
PV= （ - ） current market price of the bond
FV= the maturity value of the bond
CPT（I/Y） I/Y= period rate of one payment period
r_d = YTM = annualized I/Y

Debt-rating approach

r_d = yield on comparably rated bonds for maturities that closely match that of the company's existing debt

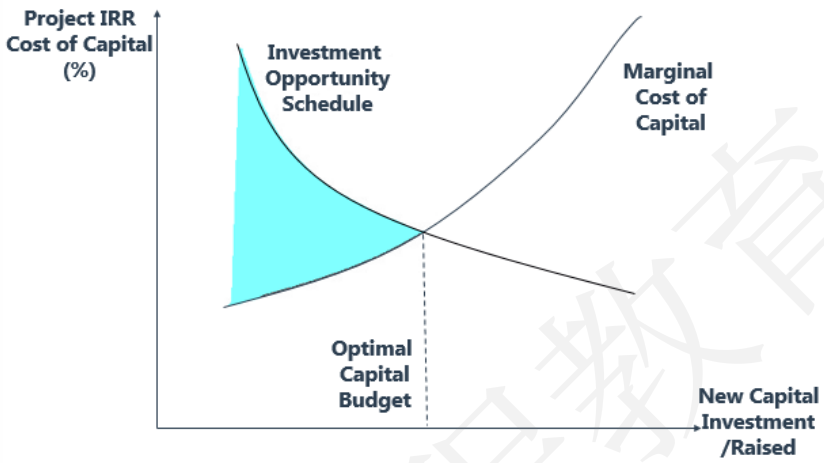
Cost of preferred stock

$$r_{ps} = \frac{D_1}{P}$$

Cost of equity

CAPM	上市	$r_e = r_f + \beta(r_m - r_f)$
	非上市	$\beta_{asset} = \beta_{equity} \frac{1}{[1+(1-t)\frac{D}{E}]}$ $\beta^*_{equity} = \beta^*_{asset}[1+(1-t')\frac{D'}{E'}] \longrightarrow r_e^* = r_f + \beta^*(r_m - r_f)$
	CRP	$r_e = R_f + \beta[E(R_{mkt}) - R_f + CRP]$
	CRP	$CRP = \text{Sovereign yield spread} \times \frac{\sigma_e \text{ of developing country (annualized)}}{\sigma_{\text{sorvereign bond}} \text{ of the developed market currency (annualized)}}$
DDM	Gordon Growth Model	$P_0 = D_1/(r_e - g)$, $r_e = D_1/P_0 + g$
Bond yield plus RP	r_e=bond yield + risk premium	

Optimal capital budgeting, marginal cost of capital & flotation costs

Optimal capital budgeting		➢ 选择IRR > marginal cost of capital 的项目。 ➢ investment opportunity schedule和marginal cash of capital相交时，optimal capital budgeting
Marginal cost of capital	Marginal cost of capital usually refers to the average cost of capital for different amounts of capital raised.	

Optimal capital budgeting, marginal cost of capital & flotation costs

Flotation cost

- When a company raises new capital, it generally seeks the assistance of investment bankers. Investment bankers charge the company the flotation costs based on the size and type of offering.
- 如果有flotation costs，就需要在分母P上进行衡量：

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

- 如果有flotation costs，在计算NPV时，CFA协会认为应该将其在initial CF进行调整，而不需要在分母上进行调整：

$$NPV = -\text{initial cash flow} - \text{floatation cost} + \sum_{i=1}^{n}\frac{CF_i}{(1+WACC)^i}$$

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Measures of Leverage

Leverage and risk

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

Fixed cost	➢ Operating fixed costs create operating leverage ➢ Financial fixed costs create financial leverage
Leverage	➢ Leverage increases the volatility and risks ➢ Greater leverage → greater risk → greater discount rate → 影响 Equity and enterprise value ➢ During downturn, greater chance to incur significant losses, accelerate financial distress and bankruptcy
Cost structure	➢ The risk of future earnings and cash flows of a company are affected by the company's **cost structure** ➢ **Fixed costs:** expenses regardless of the production and sales of the company ➢ **Variable costs:** fluctuate with the level of production and sales
Conclusion	➢ **More fixed costs** (both financial and operating) relative to variable costs → greater variation of net income, as the fluctuation of revenue (changes in sales volume)

Leverage and risk

Business risk: operating earnings (costs of producing revenues)

Sales risk	➢ **Sales risk** associates with the price and quantity ➢ **Factors influence the sales risk:** economic conditions, industry dynamics, government regulation, and demographics
Operating risk	➢ **Operating risk** arise from the operating cost structure ➢ The greater the fixed operating costs relative to variable operating costs, the greater the operating risk
Degree of operating leverage	➢ DOL=percentage change in operating income/percentage change in units produced and sold ➢ Operating costs are very similar among companies in the same industry

DOL	**定义**	**计算**
	$DOL=\frac{\text{percentage change in EBIT}}{\text{percentage change in sales}}=\frac{\frac{\Delta EBIT}{EBIT}}{\frac{\Delta Q}{Q}}$	$DOL=\frac{Q(P-VC)}{Q(P-VC)-FC}=\frac{S-TVC}{S-TVC-FC}$

Leverage and risk

Financial risk is the risk associated with how a company finances its operation

Degree of financial risk

- DFL=percentage change in net income/percentage change in operating income
- Using financial leverage generally increases the variability of the return on equity

DFL

定义	计算
$DFL=\frac{\text{percentage change in EPS}}{\text{percentage change in EBIT}}=\frac{\frac{\triangle EPS}{EPS}}{\frac{\triangle EBIT}{EBIT}}$	$DFL=\frac{EBIT}{EBIT-Interest}$

Leverage and risk

Total leverage: both financial and operating leverage contribute to the risk associated with their future cash flows.

Degree of total leverage	➢ DTL measure the sensitivity of net income to changes in the number of units produced and sold. ➢ DTL=percentage change in net income/percentage change in the number of units produced and sold	
	定义	**计算**
DTL	$DTL = DOL \times DFL = \frac{\%\triangle EBIT}{\%\triangle sales} \times \frac{\%\triangle EPS}{\%\triangle EBIT} = \frac{\%\triangle EPS}{\%\triangle sales}$	$DTL = \frac{Q(P-VC)}{Q(P-VC)-FC-I} = \frac{S-TVC}{S-TVC-FC-I}$

Breakeven analysis

Breakeven analysis	The number of units at which the net income is zero	
	$P \times Q_{BE} = V \times Q_{BE} + F + C$ Where ➢ P=the price per unit ➢ Q_{BE} =the number at which the net income is zero ➢ V=the variable costs per unit ➢ F=the fixed operating costs ➢ C=the fixed financial costs $Q_{BE} = (F+C)/(P-V)$	$Q_{BE} = \frac{\text{Fixed operating costs + fixed financial costs}}{\text{Price-variable cost per unit}}$
Operating breakeven points	$P \times Q_{OBE} = V \times Q_{OBE} + F$ $Q_{OBE} = F/(P-V)$	$Q_{OBE} = \frac{\text{Fixed operating costs}}{\text{Price-variable cost per unit}}$

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Working Capital Management

Liquidity measures and management				
Primary sources of liquidity → 正常的流动性来源 **Secondary sources of liquidity → 影响公司发展的流动性来源**				
Working capital	Inventory	Accounts receivable	Accounts payable	Cash
	Current assets - current liabilities = net working capital			

Evaluate relative portfolio performance (risk-adjusted returns)	
Drags on liquidity	When receipts lag, drags on liquidity create pressure from the decreased available funds (**receive too slowly**).
Pulls on liquidity	Disbursements are **paid too quickly** or trade credit availability is limited, requiring companies to expand fund before the sales fund comes to cover the liability.

Liquidity measures and management

Current ratio = Current assets / current liabilities
Quick ratio = [cash + marketable securities + receivable] / current liabilities
Cash ratio = [cash + marketable securities] / current liabilities

Inventory	A/R	A/P
Inventory turnover = COGS / average inventory	Receivables turnover = Credit sales / average A/R	Payables turnover = purchase / average A/P
Average inventory processing period =365/ inventory turnover	Average receivables collection period = 365/ receivables turnover	Average payment period= 365 / payables turnover
Operating cycle = collection period + inventory period		
Cash conversion cycle = collection period + inventory period - payment period		

Liquidity measures and management

Working capital management	管理方法	
Inventory management	➢ Calculate average days of inventory and inventory turnover ratios ➢ Make comparison within the same industry and business strategies	
Payable management	Terms "2/10, net 30" → 计算 Cost of trade credit $=\left(1+\frac{\text{discount}}{1-\text{discount}}\right)^{365/t}-1$	
Cash management ➔ 计算	Percentage discount from face value	$\%\text{discount}=\left(\frac{FV-P}{FV}\right)$
	Discount-basis yield	$\text{discount basis yield}=\left(\frac{FV-P}{FV}\right)\left(\frac{360}{t}\right)=\%\text{discount}\times\left(\frac{360}{t}\right)$
	The money market yield	$R_{mm}=\left(\frac{F-P}{P}\right)\left(\frac{360}{t}\right)=HPR\times\left(\frac{360}{t}\right)$
	The bond equivalent yield	$BEY=\left(\frac{F-P}{P}\right)\left(\frac{365}{t}\right)=HPR\times\left(\frac{365}{t}\right)$

Short-term funding

The risk short-term investment	➢ Credit risk ➢ Market risk	➢ Liquidity risk ➢ Foreign exchange risk

From banks

Sources	Definition
Lines of credit	➢ **Uncommitted line of credit:** bank reserves the right to refuse to honor any request for use of the line; ➢ **Committed line of credit:** bank charges a fee for making a commitment for short term lending, more reliable; ➢ **Revolving line of credit:** a commitment for longer term lending ,more reliable than committed term lending.
Collateral for borrowings	Pledge assets as collateral for bank borrowings
Banker's acceptances	Mainly used by firms that export goods, who get guarantee from the buyer's bank
Factoring	Sale A/R to bank

For non-bank sources➔ expensive for small firms

Non-bank finance company	small weak borrowers with weak credits;
Commercial paper	Large corporations, cost of short-term fund is the lowest.