Financial Statement Analysis

2017年CFA二级培训项目

讲师：洪波

10/% Contribution Breeds Professionalism

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师资简介

- **工作职称：**金程首席培训师、英国纽卡斯尔大学国际金融分析硕士（优等学位）、CFA（注册金融分析师）、RFP（注册财务策划师）、香港财经分析师学会会员
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- **工作背景：12年专业金融培训经验，深悉各类金融资格证书考试重点及行业热点。**先后讲授CFA 一级40班次，二级20班次，三级30班次，RFP课程10次，CFRM课程5次等。授课范围广泛，包括权益投资、固定收益投资、财务报表分析、经济学、衍生品投资、投资组合、资产配置、个人理财、私募投资、企业估值、债券投资组合管理等，同时也进行客户指定专题的培训。授课深入浅出，逻辑清晰，备受学员喜爱。拥有丰富金融从业经验，服务于摩根大通证券研究部和毕德投资咨询公司，从事行业与公司的分析和研究。在收购兼并等方面为跨国公司提供财务顾问咨询服务。并为国内中小企业寻找战略投资者和机构投资者提供咨询服务。精通日语，曾创立并领导日语小组支持东京的投资银行部门和债券市场部门。
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Topic Weightings in CFA Level II

Session NO.	Content	Weightings
Study Session 1-2	Ethics & Professional Standards	10-15
Study Session 3	Quantitative Methods	5-10
Study Session 4	Economic Analysis	5-10
Study Session 5-6	**Financial Statement Analysis**	**15-20**
Study Session 7-8	Corporate Finance	5-15
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Study Session 16-17	Portfolio Management	5-10

Framework

F.R.A

- **SS6 Quality of Financial Reports and Financial Statement Analysis**
  - Reading 19 Evaluating Financial Reporting Quality
  - Reading 20 Integration of FSA Techniques *
- **SS5 Intercorporate Investments, Post-Employment and Share-Based Compensation, and Multinational Operations**
  - Reading 16 Intercorporate Investments *
  - Reading 17 Employee Compensation: Postretirement and Share-based *
  - Reading 18 Multinational Operations *

Reading 16

Intercorporate Investments

Framework

1. Overview
2. Financial assets
3. Associate
4. Joint ventures
5. Controlling interest investment
6. Effect of the methods
7. Business combination
8. SPE and VIE

Categorization of investment: overview

	Financial assets	Associates	Business combination	Joint Ventures
Degree of Influence	No significant	Significant	Control	Shared control
Typical % Interest	<20%	20% - 50%	> 50%	Varies
Term of investee	N/A	Associate	Subsidiary	N/A
Treatment – US GAAP	Cost or Market ▪ HTM; ▪ AFS ▪ Fair value through P/L (including TS & Designated at FV)	Equity Method	Acquisition method	Equity Method (In rare cases, proportionate consolidation)
Treatment – IFRS				

➢ **Percentage of interests held by investors is not the sole criterion of degree of influence. Other factors should be considered, such as, involvement in policy and decision making.**

Financial assets

➢ **Financial assets:**

- This classification below only applies to debt or equity investment with no significant influence (percentage of interests < 20%)
- HTM only for debt securities
- AFS
- Fair value through P/L (including TS & Designated at FV)

➢ **Debt securities held-to-maturity:**

- are securities of which a company has the positive intent and ability to hold to maturity.
- This classification applies only to debt securities; it does not apply to equity investments.
- Initial recognition (similar under IFRS and US GAAP)
  - ✓ IFRS: fair value plus transaction costs;
  - ✓ US GAAP: at cost including transaction costs.
- Over the holding period, the discount or premium is amortized.

Financial assets

➢ **Fair value through profit or loss**

- Debt and equity held for trading (TS)
  - ✓ are securities acquired for the purpose of selling them in the near term;
  - ✓ Financial assets are stated at fair value at each B/S date;
  - ✓ Both realized and unrealized gain or loss are recognized on I/S;
- Designated at fair value
  - ✓ A financial assets is designated regardless the holding intention;
  - ✓ The treatment is similar to that of TS.

*IFRS 9——the new standards

*U.S. GAAP is similar to current IFRS 9.

Financial assets

- **Debt and equity securities available-for-sale (AFS)**
  - Not classified as HTM, TS or designated at fair value;
  - Financial assets are stated at fair value at each B/S date;
  - Only realized gain or loss are recognized on I/S,
  - The unrealized gain or loss are recognized on equity until selling
  - FX changes
    - ✓ Debt:
      - ◆ US GAAP, all to OCI;
      - ◆ IFRS, **FX changes into P/L; other changes in fair value into OCI;**
    - ✓ Equity:
      - ◆ under both IFRS and US GAAP, all changes in fair value into OCI.

Financial assets

- **Summary of reporting methods for minority passive investment**

	Held-to-Maturity (HTM)	Available-for-sale (AFS)	Fair value through profit or loss
Carrying value (Balance sheet)	Amortized cost	Fair value	Fair value
Return (Income statement)	• Interest; • Realized G/L;	• Interest; • Dividend; • Realized G/L; • Unrealized G/L is recognized in equity (not in I/S) and released to I/S when realize.	• Interest; • Dividend; • Realized G/L • and unrealized G/L;

Amortized cost

Market interest rate 8% < Coupon rate 10%

	Beginning BV 1st Jan	Interest income @ 8%	Coupon @ 10%	Ending BV 31st Dec
Year 2003	**1051.54**	**84.12**	**(100)**	**1035.66**
Year 2004	**1035.66**	**82.85**	**(100)**	**1018.52**
Year 2005	**1018.52**	**81.48**	**(100)**	**1000.00**

Examples: Financial assets

- GF purchased a 9% bond with a face value of $100,000. The bond was issued for $96,209 to yield 10%. The coupon payments are made annually at year-end. Assume the fair value of the bond at the end of the year is $98,500.

  Determine the impact f the bond investment is classified as held-to-maturity, held for trading, and available for sale.

  - **Held-to-maturity.**
    - ✓ The balance sheet value is based on amortized cost.
    - ✓ At year-end, Midland recognizes interest revenue of $9,621 ($96,209 beginning bond investment * 10% market rate at issuance).
    - ✓ The interest revenue includes the coupon payment of $9,000 ($100,000 face value * 9% coupon rate) and the amortized discount of $621 ($9,621 interest revenue - $9,000 coupon payment).
    - ✓ At year-end, the bond is reported on the balance sheet at $96,830 ($96,209 beginning bond investment + $621 amortized discount).

Examples: Financial assets

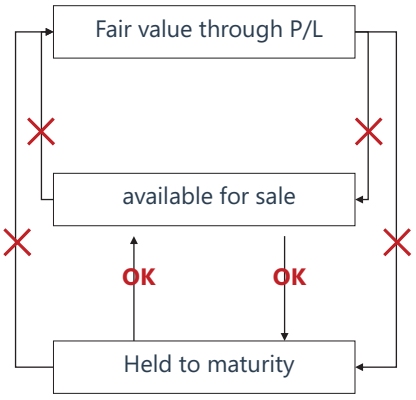
- **Fair value through profit or loss.**
  - ✓ The balance sheet value is based on fair value of $98,500.
  - ✓ Interest revenue of $9,621 ($96,209 beginning bond investment * 10% yield-to-maturity at issuance) and
  - ✓ an unrealized gain of $1,670 ($98,500 - $96,209 - $621) are recognized in the income statement.
- **Available-for-sale.**
  - ✓ The balance sheet value is based on fair value of $98,500.
  - ✓ Interest revenue of $9,621 ($96,209 beginning bond investment * 10% yield-to-maturity at issuance) is recognized in the income statement.
  - ✓ The unrealized gain of $1,670 ($98,500 - $96,209 - $621) is reported in stockholders' equity as a component of other comprehensive income (U.S. GAAP) or direct to equity (IFRS).

Examples: Financial assets

- Now let's assume the bonds are called on the first day of the next year for $101,000. Calculate the gain or loss recognition for each classification.
  - ✓ Held-to-maturity: A realized gain of $4,170 ($101,000 - $96,830 carrying value) is recognized in the income statement.
  - ✓ Fair value through profit or loss: A net gain of $2,500 ($1 01,000 - $98,500 carrying value) is recognized in the income statement.
  - ✓ Available-for-sale: The unrealized gain of $1,670 is removed from equity, and a realized gain of $4,170 ($101,000 - $96,830) is recognized in the income statement.

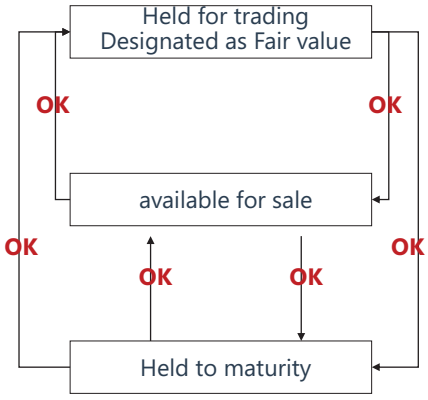
Financial assets - Reclassification

IFRS



U.S. GAAP

U. S. GAAP does permit securities to be reclassified.



Financial assets - Reclassification

Under U.S. GAAP		
From	To	Unrealized Gain or Loss
FV through P/L	Any	Income Statement (to extent not recognized)
Held-to-maturity	FV through P/L	Income Statement
Held-to-maturity	Available-for-sale	Other comprehensive income
Available-for-sale	Held-to-maturity	Amortize out of other comprehensive income
Available-for-sale	FV through P/L	Transfer out of other comprehensive income

Under IFRS		
From	To	Unrealized Gain or Loss
Held-to-maturity	Available-for-sale	Other comprehensive income
Available-for-sale	Held-to-maturity	Amortize out of other comprehensive income

Financial assets

- **Impairments (IFRS) of Both HTM and AFS**
  - Impairment of a debt or equity security is indicated if at least one loss event has occurred, and its effect on the security's future cash flow can be estimated reliably.
  - For debt, loss events: default on payments of interest or principal, likely bankruptcy or reorganization of the issuer, concessions from the bondholders, or other indications of financial difficulty on the part of the issuer. (如果没有其他证据，纯粹信用等级下调或市场缺乏流动性不算。)
  - For equity, a loss event: substantial or extended decline; unlikely to recover.
  - HTM impaired: carrying value decreased to PV of CF, using the same effective interest rate.
  - Reversals:
    - ✓ Debt: can be reversed if its recovery can be attributed to an event (such as a credit upgrade.)
    - ✓ Equity: reversal of impairments are not permitted.

Financial assets

- **Impairments (IFRS)**
  - HTM
    - ✓ Impaired if its carrying amount > PV of CF;
    - ✓ Impairment loss is recognized on I/S if impaired;
    - ✓ reversal of impairment is also recognized through I/S only when directly related with events resulting losses disappear.
  - AFS
    - ✓ Carrying amount>Fair value
    - ✓ Cumulative loss in OCI is reclassified to I/S = Cost-FV-Losses recognized in I/S
    - ✓ Reversal
      - ◆Debt: recognized through I/S only when directly related with original events resulting initial losses disappear
      - ◆Equity: can **NOT** be reversed through I/S

Financial assets

- **Impairments (US GAAP)**
  - Both HTM and AFS
    - ✓ Declining in value is other than temporary, the write-down to fair value is treated as a realized loss (i.e., recognized on I/S)
    - ✓ A subsequent reversal of impairment losses on I/S is not allowed.

Financial assets

- **Exceptions summary:**
  - Under IFRS
    - ✓ For AFS debt securities: (two exceptions)
      - ◆ Foreign exchanges G/L recognized in P/L
      - ◆ Impairment reversal only when directly related with original events resulting initial losses disappear.

Financial assets

- **IFRS 9 (new standards):**
  - IFRS does away with held-for-trading, AFS, and HTM. Instead, the 3 classifications are amortized cost, FV through P/L(FVPL), and FV through OCI (FVOCI).
    - ✓ amortized cost (Debt only)——2 criteria
      - ◆Business model test: debt securities are being held to collect contractual cash flows.
      - ◆Cash flow characteristic test: the contractual cash flow are either principal, or interest on principal, only.
    - ✓ FVPL(D & E)
      - ◆Debt——held-for-trading OR amortized cost results in accounting mismatch
      - ◆Equity——held-for-trading must be classified as FVPL; others may be classified as either FVPL or FVOCI, irrevocable.
    - ✓ FVOCI (Equity only)
      - ◆Same as AFS

Reclassification of equity is not permitted. Reclassification of debt instruments from FVPL to amortized cost (or vice versa) is only permitted.

Associate

- **Associates** refers to entity is significant influenced by an investor
  - With **typical** ownership interests between 20% and 50%;
  - Other criteria for significant influence:
    - ✓ Representation of board directors;
    - ✓ Participation in policy making;
    - ✓ Material transactions;
    - ✓ Interchange of managerial personnel; or
    - ✓ Technological dependency.

Associate

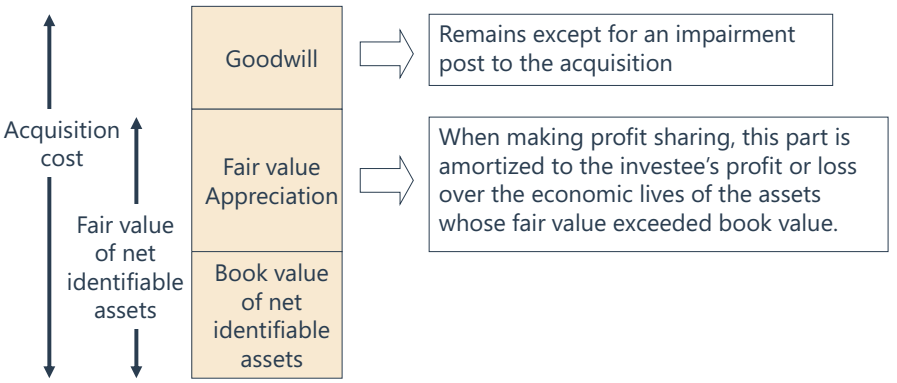
- Equity Method - Basic
  - Recognize the cost of investment at inception;
  - One-line consolidation;
  - Share the results of investee (investee's earnings increase the investment account;
  - decrease in the investment when dividend from investee declared) ;
- The carrying amount of investment in the B/S

  = cost of investment + (adj. accumulated net profit of the investee – accumulated dividends declared by the investee) X percentage of interest owned;
- I/S: a gain is recognized = current year's net profit of the investee X percentage of interest owned; (usually separated from operating income.)

Associate

Equity Method – More complicated issues

- If the interests in an associate is acquired with consideration in excess of book value, how to deal with it?



Associate

- Equity Method – More complicated issues

  Price in excess of book value.

  - Goodwill is the amount that consideration in acquiring the equity interests of investee in excess of related the fair value of equity.
  - Acquisition cost (consideration) is initially recognized as investment in associate, and comprises of two parts:
    - ✓ Fair value of the net assets acquired; and
    - ✓ Goodwill.
  - **The appreciation part arising from differences between fair value and book value of the net assets acquired will adjust the I/S of investor's equity income (not simply equals to the net income earned by investee multiplied by percentage of interests owned) after the acquisition.**
  - Impairment of investment in associate should be considered.

Associate - Equity Method – Example 2

- P acquired 20% of interests in E with cash 12,000 on 1 Jan 2007;
- In FY07, the E earned NI with 7,000 and paid dividend 1,000;
- The F/S of E and P as at incorporation and 31 Dec 2007 are as follows:

B/S	E				P		
	01/Jan/07			31/Dec/07	01/Jan/07	31/Dec/07	
	book value	fair value	Diff	book value			
Assets							
Cash	10,000	10,000	-	20,000	50,000	60,200	
PP&E - cost	20,000	30,000	10,000	20,000			
PP&E - AD	(4,000)	-	4,000	(8,000)			
Investment	-	-		-	12,000	12,500	12k+(0.7k-0.2k), see next page
	26,000	40,000	14,000	32,000	62,000	72,700	
Equities							
Capital	20,000			20,000	30,000	30,000	32k+10.7k, see next page
R/E	6,000			12,000	32,000	42,700	
	26,000	40,000	14,000	32,000	62,000	72,700	

Why not 7k*20%? Because of additional depreciation

Associate

➢ Equity Method – Example 2

- The useful live of PP&E is 5 years. And used for 1 year as at 1 Jan. 07.

	E	P
Operating profit margin	7,000	10,000
Dividend income	-	-
Equity income	-	700
PBT	7,000	10,700
Taxation	-	-
Net income	7,000	10,700
Equity income:		
NI of E	7,000	
Dep. Adj.	(3,500)	
Adjusted NI	3,500	
Equity income of P	700	

Investment cost - beginning	12,000
Representing	
- NBV of net assets (26k*20%)	5,200
- Fair value appreciation ((30k-(20k-4k))*20%)	2,800
- Goodwill	4,000
	12,000
share results	700
dividend	(200)
	12,500

Adjustment on depreciation	
Fair value of PP&E	30,000
Remaining useful lives	4
Annual depreciation - based on fair value	7,500
Annual depreciation - pre-acquisition	4,000
Adjustment on depreciation	3,500

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Associate - Fair value option

➢ **Fair value option**

- US GAAP allows equity method investments to be recorded at fair value.
- Under IFRS, the fair value option is only available to venture capital firms, mutual funds and similar entities.
- The decision to use the fair value option is irrevocable.
- Any changes in value (along with dividends) are recorded in I/S.

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Associate - Impairment

➢ **Impairment**

- Both standards require periodic reviews for impairment
  - ✓ IFRS:
    - ◆One of more loss events with impact on the investment's future CF
    - ◆the entire carrying amount of investment is tested for impairment by comparing its recoverable amount with its carrying amount. (goodwill不单独测试)
    - ◆The impairment loss is recognized on the IS, and the carrying amount of the investment on BS is either reduced directly or through the use of an allowance account.
  - ✓ US GAAP:
    - ◆if the fair value of the investment declines below its carrying value and the decline is determined to be permanent.
    - ◆Impairment loss to be recognized on IS, and the carrying value of the investment on BS is reduced to its fair value.
- Both prohibit the reversal of impairment losses even if the fair value later increases.

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Associate

➢ Equity Method – Transaction with associates

- Transactions with associates (how to deal with unrealized profit?).
  - ✓ Upstream:
    - ◆associates to investor;
    - ◆All of profit is included in Investee's net income;
    - ◆Investor must reduce its equity income of Investee by Investor's proportionate share of the unconfirmed profit.
  - ✓ Downstream:
    - ◆investor to associates;
    - ◆The investor has recognized all of profit;
    - ◆Investor must reduce its equity income by the proportionate share of the unconfirmed profit.
- Elimination of unrealized profit
  - ✓ Un-realized profit refers to the profit realized by the seller but not in the prospective of whole group.
  - ✓ It is eliminated to the extent of investor's interests in the associate.

Associate

➢ Equity Method – Example 2 – transactions with associate (upstream)

- All else the same in Example 2, E sold goods to P and un-realized profit is RMB500.

	E	P
Operating profit margin	7,000	10,000
Dividend income	-	-
Equity income	-	600
PBT	7,000	10,600
Taxation	-	-
Net income	7,000	10,600

Investment cost - beginning	12,000
Representing	
- NBV of net assets	5,200
- Fair value appreciation	2,800
- Goodwill	4,000
	12,000
share results	600
dividend	(200)
	12,400

Equity income:	
NI of E	7,000
Dep. Adj.	(3,500)
Adjusted NI	3,500
Equity income of P	700
Less: un-realized profit	(100)
Adjusted equity income	600

500 * 20%

Associate

➢ Equity Method – Example 2 – transactions with associate (downstream)

- All else the same in Example 2, P sold goods 9,600 to E for 16,000; and E resold 12,000.

	E	P
Operating profit margin	7,000	10,000
Dividend income	-	-
Equity income	-	380
PBT	7,000	10,380
Taxation	-	-
Net income	7,000	10,380

Investment cost - beginning	12,000
Representing	
- NBV of net assets	5,200
- Fair value appreciation	2,800
- Goodwill	4,000
	12,000
share results	380
dividend	(200)
	12,180

Equity income:	
NI of E	7,000
Dep. Adj.	(3,500)
Adjusted NI	3,500
Equity income of P	700
Less: un-realized profit	(320)
Adjusted equity income	380

Unrealized profit	
Amt of goods un-sold	4,000
GP margin in P	40%
Total unrealized profit	1,600
To the extent of investor (20%)	320

16k-12k E resold

(16k-9.6k)/16k

Example—Equity Method

- GF purchased 30% of D for $80,000. On the acquisition date, the book value of D's identifiable net assets was $200,000. Also, the fair value and book value of D's assets and liabilities were the same except for D's equipment, which had a book value of $25,000 and a fair value of $75,000 on the acquisition date. D's equipment is depreciated over ten years using the straight-line method. At the end of the year, D reported net income of $100,000 and paid dividends of $60,000
  - Calculate the goodwill, GF's income at the end of the year from its investment in D.
  - Calculate the investment in D that appears on GF's year-end balance sheet.
    - ✓ The excess of purchase price over the proportionate share of D's book value is allocated to the equipment. The remainder is goodwill:

Example—Equity Method

- **Example :**

Purchase price:	$80,000
Less: Pro-rata book value of net assets:	$60,000 ($200,000 book value * 30%)
Excess of purchase price:	$20,000
Less: Excess allocated to equipment:	$15,000 [($75,000 FV - $25,000 BV) * 30%]
Goodwill:	$5,000

Associate

- GF recognizes its proportionate share of D's net income for the year. Also, GF must recognize the additional depreciation expense that resulted from the purchase price allocation.

Red's proportionate share of Blue's net income:	$30,000 ($100,000 NI * 30%)
Less: Additional depreciation from excess of purchase price allocated to Blue's equipment:	$1,500 [($75,000 – 25,000)*30% / 10 years)]
Equity income:	$28,500

- The beginning balance of Red's investment account is increased by the equity income from Blue and is decreased by the dividends received from Blue.

Investment balance at beginning of year:	$80,000 (Purchase price)
Equity income:	$28,500 (From previous part)
Less: Dividends:	$18,000($60,000 * 30%)
Investment balance at end of year:	$90,500

Associate

- **Equity Method – Analyst issues: Whether the equity method is appropriate?**
  - When an investee is profitable, and its dividend payout ratio is less than 100%, the equity method usually results in higher earnings as compared to the accounting methods used for minority passive investments.
  - Under equity method, the assets and liabilities of the associates are not reflected on B/S of the investors but just one line of net assets shared by the investors.
  - The similar issue also exists on I/S, investors only record one line of equity income but not the full set of I/S of associates.
  - The quality of the equity method earnings. If cash is received?

Joint ventures

- US GAAP and IFRS require the equity method of accounting for joint ventures.
- In rare circumstances, the proportionate consolidation method may be allowed under US GAAP and IFRS.

- **Proportionate consolidation**
  - similar to a business acquisition,
  - except the investor only reports the proportionate share of the assets, liabilities, revenues, and expenses of the joint venture.
  - Since only the proportionate share is reported, no minority owner's interest is necessary.

Controlling interest investment

- Framework for consolidation
  - If the investor obtains controlling interests in an entity, the investor is referred to as Parent, and the entity being controlled is referred to as Subsidiary;
  - If the controlling relationship exists, a separated set of financial statements which comprises those of the Parent and Subsidiary should be prepared. This set of FS refers to as Consolidated Financial Statements.
  - The consolidated FS is a combination of FS of Parent and Subsidiary with a certain elimination adjustments. It's NOT the FS for parent itself.

Controlling interest investment

➢ **Framework for consolidation**

- The B/S and I/S of the Subsidiary and Parent are included in the consolidated financial statements;
- Investment in the subsidiaries (item on Parent's B/S) are eliminated;
- Minority Interests (MI) are recognized both in the income statements and balance which accounts for the net profits and net assets of the subsidiaries owned by the minority shareholders;
  - ✓ MI is regarded as an isolated item.
- All transactions among the entities consolidated are eliminated;

Controlling interest investment

➢ **Acquisition method – Example 3**

B/S	E		P (stand alone)		Acquisition method	
	01/Jan/07	31/Dec/07	01/Jan/07	31/Dec/07	01/Jan/07	31/Dec/07
Assets						
Cash	10,000	15,000	50,000	60,800	60,000	75,800
Investment	-	-	**8,000**	**12,000**	-	-
	10,000	15,000	58,000	72,800	60,000	75,800
MI	-	-	-	-	**2,000**	**3,000**
Equities						
Capital	10,000	10,000	30,000	30,000	30,000	30,000
R/E	-	5,000	28,000	42,800	28,000	42,800
	10,000	**15,000**	58,000	72,800	58,000	72,800
Total	10,000	15,000	58,000	72,800	60,000	75,800

Controlling interest investment

➢ **Acquisition method – Example 3**

Income statement	E	P	Acquistion method
Operating profit margin	6,000	10,000	16,000
Dividend income	-	-	-
Investment income	-	4,800	-
PBT	*6,000*	14,800	16,000
Taxation	-	-	-
MI	-	-	*(1,200)*
Net income	6,000	14,800	14,800

Effect of the methods

- **Effect of choice of method on financial ratios**
  - All three methods report the same net income .
  - Equity and proportionate consolidation report the same equity. Acquisition method equity will be higher by the amount of minority interest .
  - Assets and liabilities are highest under the acquisition method and lowest under the equity method; Proportionate consolidation is in-between .
  - Sales are highest under the acquisition method and lowest under the equity method ; proportionate consolidation is in-between .

Three methods—Summary

- GF has acquired the D company at the beginning of the year, if D reported a $60 earnings in that year, what impact will GF's income statement have if GF use equity method, acquisition or proportionate method?

	Equity method	**Acquisition method**	**Proportionate method**
D's I/S	**GF's I/S**	**GF's I/S**	**GF's I/S**
Revenue = 100	+48(60*80%)	R_{GF} + 100	R_{GF} + 80
-COGS= 40		-($COGS_{GF}$+ 40)	-($COGS_{GF}$+ 32)
		-Minority int 12	
NI=60	NI_{GF} +48	NI_{GF} +48	NI_{GF} +48
Note: All three methods have the same net income!			

Business combination

Conceptual framework – Form of Business combination

- Business combination refers to a combination of business, or so-called merger and acquisition. Business combination may can take several forms:
  - Merger

    A + B = A
  - Acquisition

    A + B = (A + B) (a group, controlling interests investment relationship)
  - Consolidation

    A + B = C
  - SPE or Variable Interests Entity
- IFRS and SFAS now require that all business combinations be accounted for as acquisitions, whereby one entity (the parent) takes management control of another entity (subsidiary, or the parent takes control of the subsidiary's assets and liabilities.

Business combination

- **Conceptual framework – Diff. between Business Combination & Consolidation of FS**
  - Accounting for business combination involves how to treat the M&A transactions by the acquirer.
  - Consolidation of financial statements refers to preparing a group's financial statements to include the financial statements of subsidiaries by investors if the controlling interests exist.
  - Business combination may result in a controlling interest, Acquisition. Under this circumstances, consolidation of FS should be applied post to the completion of the M&A when preparing the FS of the acquirer.
  - Business combination may not result in a controlling interest, Statutory Merger or Statutory Consolidation. Under this circumstances, consolidation of FS is not applicable as the acquirer and acquiree have been combined into one entity, ie. there is no separated FS for the acquirer and acquiree respectively.

Business combination – Acquisition method

- **Example**: A acquired 100% of interests in T on 1 Jan 2007 (acquisition, T becomes the subsidiary of A post the acquisition);
- The total consideration is 500;
- The B/S of A and T are:
- The consolidated B/S as at 1 Jan 2007 post acquisition?

Balance sheet as at 1 Jan 2007

	Historical			FV
	A Pre-acq	A Post-acq	T	T
Cash	600	100	30	30
Inventory	150	150	50	80
AR	150	150	50	50
	900	400	130	160
F/A	400	400	250	300
I/A	-	-	-	100
Invest.	-	500	-	-
	400	900	250	400
	1,300	1,300	380	560
AP	400	400	180	180
Capital	550	550	150	380
R/E	350	350	50	
	1,300	1,300	380	560

Business combination – Acquisition method

Balance sheet

	T			A	Combined	Acquisition method Adj.	Acquisition method
	historical	FV adj.	Adjusted	Post-acq			
Cash	30	-	30	100	130		130
Inventory	50	30	80	150	230		230
AR	50	-	50	150	200		200
	130	30	160	400	560	-	560
F/A	250	50	300	400	700		700
I/A	-	100	100	-	100		100
Invest.	-	-	-	500	500	(500)	-
GW	-	120	120	-	120		120
	250	270	520	900	1,420	(500)	920
	380	300	680	1,300	1,980	(500)	1,480
AP	180	-	180	400	580		580
Capital	150	-	150	550	700	(150)	550
R/E	50	-	50	350	400	(50)	350
FV adj.	-	300	300	-	300	(300)	-
	380	300	680	1,300	1,980	(500)	1,480

GW=500-(560-180)=120

Business combination – Acquisition method

- **Example**: Goodwill = consideration (acquisition cost) + fair value of minority interests – fair value of net asset of the Target;
- Under the this example, the controlling interest results from the acquisition, T becomes the subsidiary of A.
  - T prepares the FS of itself in a consistent way post acquisition as that prior to the acquisition.
  - When prepares consolidated FS, the assets and liabilities of T are adjusted by fair value at the acquisition date (only for the assets and liabilities exist prior to the acquisition);
  - During the period subsequent to the acquisition, adjustments are made both on B/S and I/S to amortize the fair value appreciation/depreciation, except for goodwill;
- If the target is merged to acquirer, no subsidiary and parent relationship, the assets and liabilities are combined to acquirer's FS at fair value at the acquisition date.

Business combination – Acquisition method

- **Example**: The I/S in FY07 is as follows, assuming:
  - All inventories of T at beginning FY07 was sold in FY07;
  - Remaining useful lives of FA of T are 10 years;
  - Useful lives of IA are 10 years.
  - No transaction incurred in FY07 between A and T.

Inventory increased fair value of 30.

FA increased fair value of 50. 50/10=5

IA increased fair value of 100. 100/10=10

Income statement	FY07				FY06		
	A	T	FV adj.	Acquisition method	A	T	Acquisition method
Sales	2,000	1,000	-	3,000	2,000	1,000	2,000
COGS	(1,000)	(600)	(30)	(1,630)	(1,000)	(600)	(1,000)
Depre. of F/A	(40)	(30)	(5)	(75)	(40)	(30)	(40)
Amort. of I/A	-	-	(10)	(10)	-	-	-
S&G Exp.	(300)	(200)	-	(500)	(300)	(200)	(300)
Taxation	(200)	(50)	-	(250)	(200)	(50)	(200)
Net income	460	120	(45)	535	460	120	460

Business combination – Acquisition method

- **Example:** Key points for I/S post acquisition:
  - I/S of the target is included in consolidated I/S from the date of acquisition;
  - Some items might be adjusted due to the fair value adjustment:
    - ✓ COGS is adjusted to reflect the fair value of inventory of the target prior to acquisition;
    - ✓ Depreciation is adjusted to reflect the fair value of FA of the target prior to acquisition;
    - ✓ Amortization of I/A is also adjusted as similar with that in FA.
    - ✓ Please be noted, similar to B/S, under this example, T prepares its I/S in a way consistent with that prior to acquisition. **Only when prepares the consolidated FS, the fair value adjustments are made.**
    - ✓ In case a merger, with the combining of assets and liabilities of target at fair value into acquirer's FS, the impact on I/S post to the acquisition is also reflected.
  - Goodwill is not amortized.

Business combination – Acquisition method

Goodwill

- **Goodwill** is excess acquisition cost over fair value of identifiable assets and liabilities of the target.
  - Goodwill is not amortized;
  - Goodwill is subject to an impairment test at least annually;
  - Goodwill is impaired if the carrying value greater than the fair value;
  - An impairment provision is made to extent that carry value in excess of fair value;
  - Full goodwill under US GAAP; IFRS allows partial goodwill or Full goodwill
  - Negative Goodwill is,
    - ✓ Recognized as a gain after the re-assessment under IFRS;
    - ✓ Similar with IFRS from fiscal year after Dec 15, 2008.

Business combination–non–controlling interests

- **Goodwill & MI process are different**
  - **Full goodwill**
    - ✓ Allowed in both US GAAP and IFRS
    - ✓ = consideration / % of interests acquired – fair value of net assets;
    - ✓ MI is stated **(% of MI shareholders own)** * (consideration / % of interests acquired);
  - **Partial goodwill**
    - ✓ Only allowed under IFRS;
    - ✓ = consideration – fair value of net assets X % of interests acquired.
    - ✓ MI is stated (% of MI shareholders own) * **FV of net assets**;

Goodwill

- Wood Corporation paid $600 million for all of the outstanding stock of Pine Corporation. At the acquisition date, Pine reported the condensed balance sheet below:

Pine Corporation Condensed Balance Sheet

	Book Value (in millions)
Current assets	$80
Plant and equipment, net	760
Goodwill	30
Liabilities	400
Stockholders' equity	470

- The fair value of the plant and equipment was $120 million more than its recorded book value. The fair values of all other identifiable assets and liabilities were equal to their recorded book values. Calculate the amount of goodwill Wood should report in its consolidated balance sheet.

Goodwill

- Answer:

(in millions)		
Purchase price		$600
Current assets	$80	
Plant and equipment, net	880	
Liabilities	(400)	
Less: Fair value of net assets		560
Acquisition goodwill		$40

- Goodwill is equal to the excess of purchase price over the fair value of identifiable assets and liabilities acquired. The plant and equipment was written-up by $120 million to reflect fair value. The goodwill reported on Pine's balance sheet is an unidentifiable asset and is thus ignored in the calculation of Wood's goodwill.

Full goodwill vs. partial goodwill

- Continuing the previous example, suppose that Wood paid $450 million for 75% of the stock of Pine. Calculate the amount of goodwill Wood should report using the full goodwill method and the partial goodwill method.

Full goodwill vs. partial goodwill

- **Answer**:
- **Full goodwill method:**
- Wood's balance sheet goodwill is the excess of the fair value of the subsidiary ($450 million / 0.75 = $600 million) over the fair value of identifiable net assets acquired, just as in the example above. Acquisition goodwill = $40 million.

- **Partial goodwill method:**
- Wood's balance sheet goodwill is the excess of the acquisition price over Wood's proportionate share of the fair value of Pine's identifiable net assets:

Purchase price	$450 million
Less: 75% of fair value of net assets 0.75 x $560 =	$420 million
Acquisition goodwill	$30 million

Acquisition method — Bargain Acquisition

- In rare cases, acquisition purchase price is less than the fair value of net assets acquired.
  - Both IFRS and US GAAP require that the difference between fair value of net assets and purchase price be recognized as a gain in the income statement.

Acquisition method – goodwill impairment

- Goodwill Impairment test
- Because of its inseparability, goodwill is valued at the reporting unit level.
  - Under IFRS, testing for impairment involves a single step approach. If the carrying amount of the cash generating unit (where the goodwill is assigned) > the recoverable amount, an impairment loss is recognized. If GW decreased to zero, the excess amount of losses is pro rata allocated to the asset of associate excluding cash, trade receivable, inventory, and assets to be traded.
  - Under U.S. GAAP, goodwill impairment potentially involves two steps. In the first step, if the carrying value of the reporting unit (including the goodwill) > the fair value of the reporting unit, an impairment exists. Maximum reduction is amount of GW.

Acquisition method – goodwill impairment

- Goodwill Impairment test
- Because of its inseparability, goodwill is valued at the reporting unit level.
  - Under U.S. GAAP, goodwill impairment potentially involves two steps. In the first step, if the carrying value of the reporting unit (including the goodwill) > the fair value of the reporting unit, an impairment exists. Maximum reduction is amount of GW
    - ✓ Once it is determined the goodwill is impaired, the loss is measured as the difference in the carrying value of the goodwill and the implied fair value of the goodwill.
    - ✓ The implied fair value of the goodwill is calculated in the same manner as goodwill at the acquisition date.
  - Under both standards: The impairment loss is recorded as a separate line item in the consolidated income statement.

Goodwill impairment

- Last year, Parent Company acquired Sub Company for $1,000,000. On the date of acquisition, the fair value of Sub's net assets was $800,000. Thus, Parent reported acquisition goodwill of $200,000 ($1,000,000 purchase price - $800,000 fair value of Sub's net assets).
- At the end of this year, the fair value of Sub is $950,000, and the fair value of Sub's net assets is $775,000. Assuming the carrying value of Sub is $980,000, determine if an impairment exists and calculate the loss (if applicable) under U.S. GAAP and under IFRS.

Goodwill impairment

- **Answer:**
- **U.S. GAAP (two-step approach):**
- Since the carrying value of Sub exceeds the fair value of Sub ($980,000 carrying value > $950,000 fair value), an impairment exists.
- In order to measure the impairment loss, the implied goodwill must be compared to the carrying value of the goodwill. At the impairment measurement date, the implied value of the goodwill is $175,000 ($950,000 fair value of Sub — $775,000 fair value of Subs net assets). Since the carrying value of the goodwill exceeds the implied value of the goodwill, an impairment loss of $25,000 is recognized ($200,000 goodwill carrying value — $175,000 implied goodwill) thereby reducing goodwill to $175,000.
- **IFRS (one-step approach):**
- Goodwill impairment and loss under IFRS is 980,000 (carrying value) — 950,000 (fair value) = 30,000.

Business combination

Accounting Treatment for Business Combination

- Purchase Method (is the predecessor of acquisition method, two method has a little difference which far go beyond our curriculum)
  - The assets and liabilities acquired by the Parent should be stated at their fair value in the consolidated financials statements.
  - The consideration in excess of the fair value of the net assets acquired is recognized as goodwill which is subject to an annual impairment test instead of amortization.
  - The income statements of the acquired business is consolidated from the date of acquisition onward.
- Pooling-of-Interests Method (has been eliminated from US GAAP and IFRS)
  - The target's assets and liabilities are stated at their **book value** in the consolidated financials statements. The prior years' income statements of the two firms are also consolidated after the restatement.

Business combination

Accounting Treatment for Business Combination

- **Now the acquisition method is required.**
  - All of the assets, liabilities, revenues, and expenses of the subsidiary are combined with parent.
  - Intercompany transactions are excluded.

- 补充说明：Purchase method employs a more discretionary purchase-price-allocation approach, while acquisition method employs a more market driven recognition.

Business combination

- **Pooling method**
  - Combines the ownership interests of two companies and views the participants as equals-neither firm acquires the other;
  - Pooling of interests method is only allowed in a certain special circumstances with strict criteria under US GAAP. Under IFRS, it's not allowed.
  - Asset and liabilities of the two firms are combined (and any inter-company accounts are eliminated).
  - Major attributes of the pooling method are:
    - ✓ The two companies are combined using accounting book values.
    - ✓ Operating results for prior periods are restated as though the two firms were always combined.
    - ✓ Ownership interests continue, and former accounting bases are maintained.

7. Business combination

- **Acquisition vs. Pooling**

Differences	Purchase	Pooling
Combination	Accounted for at fair value	Accounted for at book value
Pre-acquisition earnings	Not recognized	Acquire pre-acquisition earnings are recognized by acquirer
Post-acquisition earnings	Includes additional depreciation and amortization based on fair value	Dose not include additional depreciation and amortization because book value are retained
Profit margin	Lower (because of greater depreciation, etc)	Higher (no increase in expenses)
ROA	Lower (lower earnings and higher recorded asset base	Higher
ROE	Lower (lower earnings and higher recorded equity base)	Higher

SPE and VIE

- SPEs can be a legitimate financing mechanism for a company to segregate certain activities and thereby reduce risk.
- In the past, SPEs were often maintained off-balance-sheet, thereby enhancing the sponsor's financial statements and ratios.
- Under US GAAP, a term of VIE is used. A VIE is an entity that has one or both of the following characteristics:
  - 1. At-risk equity is insufficient to finance the entity's activities without additional financial support .
  - 2. Equity investors lack any one of the following:
    - ✓ Decision making rights .
    - ✓ The obligation to absorb losses .
    - ✓ The right to receive expected residual returns.

SPE and VIE

- If an SPE is considered a VIE , it must be consolidated by the primary beneficiary. The primary beneficiary is the entity that absorbs the majority of the risks or receives the majority of the rewards.
- The IASB continues to use the term special purpose entity. According to IFRS 10, Consolidated Financial Statements, the sponsoring entity must consolidate if it controls the SPE;
- Consolidation of VIE or SPE will significantly affect the financial position of the group.

Example: SPE

- Company P, a textile manufacturer, wants to borrow $100 million. It has two options:
  - Option A: Borrow $100 million from Bank B.
  - Option B: Sell $100 million worth of accounts receivable to Company S, an SPE created for this purpose. The SPE will fund the purchase by borrowing the money from Bank B.
- Company P's balance sheet before the borrowing is provided below:

Assets	$ millions	Liabilities and Equity	$ millions
Cash	$50	Current liabilities	$500
Accounts receivable	$200	Debt	$1,200
Fixed assets	$2,000	Equity	$550
Total assets	$2,250	Total	$2,250

- Prepare company P's balance sheet under both options assuming that the SPE in option B meets the requirements for consolidation.

Example: SPE

- **Answer**:
- Option A: Company Ps cash and debt will both increase by the new borrowing of $100 million.
- Company Ps balance sheet after the borrowing:

Assets	$ millions	Liabilities and Equity	$ millions
Cash	$150	Current liabilities	$500
Accounts receivable	$200	Debt	$1,300
Fixed assets	$2,000	Equity	$550
Total	$2,350	Total	$2,350

Example: SPE

- Company Ps balance sheet after the sale of accounts receivable to the SPE:

Assets	$ millions	Liabilities and Equity	$ millions
Cash	$150	Current liabilities	$500
Accounts receivable	$100	Debt	$1,200
Fixed assets	$2,000	Equity	$550
Total	$2,250	Total	$2,250

- SPEs balance sheet after purchase of accounts receivable and bank loan:

Assets	$ millions	Liabilities and Equity	$ millions
Accounts receivable	$100	Debt	$100
Total	$100	Total	$100

Example: SPE

- After consolidation, the SPE's debt gets included with company P's debt, and accounts receivable for company P increase by the same amount.
- Company P's balance sheet after consolidation:

Assets	$ millions	Liabilities and Equity	$ millions
Cash	$150	Current liabilities	$500
Accounts receivable	$200	Debt	$1,300
Fixed assets	$2,000	Equity	$550
Total	$2,350	Total	$2,350

- The balance sheet of company P under either option is the same. Company P cannot hide the borrowing "off the books."

Reading 17

Employee Compensation: Post-Employment and Share-Based

Framework

1. Post-retirement plan overview
2. Illustration of DB
3. Balance sheet presentation
4. Pension disclosure
5. Share-based compensation

Post-retirement plan overview

- **Many firms offer various types of benefits to their employees following retirement, such as:**
  - Pension plan;
  - Medical insurance; and Life insurance.
- **The typical post-retirement plans are:**
  - Defined-contribution pension plan (DC);
    - ✓ The amount contributed by employers are defined but the future value of plan is unknown.
  - Defined-benefit pension plan (DB);
    - ✓ Employer promises to pay a certain annual amount to employees after retirement.
  - Other post-retirement benefits (OPB)
    - ✓ Life insurance premiums, health insurance. Similar to DB. Usually unfunded.

Post-retirement plan overview

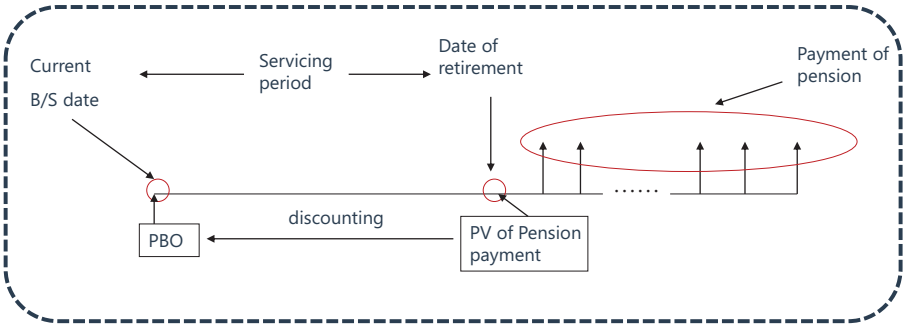
- **DC plan 缴费确定型**
  - Employer make periodical contributions to specific accounts;
  - The contribution made by employer is fixed or pre-determinable;
  - The obligation of employers is make contribution on time;
  - The amount received by employees after retirement depends on the fair value of the specific accounts accumulated;
  - The accounting for DC plan is quite simple, **expensed as incur**.
- **DB plan 收益确定型**
  - Employers promise to payment a certain amount to employees after their retirement;
  - The obligation of employer is pay a pre-determined amount to employees after their retirement; the amount received by employee is pre-determined;
  - Firms usually set up several funds to meet the future liabilities;
  - The accounting for DB plan is complicated.

Post-retirement plan overview

	DC	DB	OPB
Amount of benefit	✓ Not determined; ✓ Depends on future value of plan assets	✓ Pre-determined	✓Depends on specifications of plan
Investment risk	✓ Born by employee	✓ Born by employer	✓ Depends
Employer's obligation	✓ make periodic contributions	✓ Make pre-determined payment to retiree	✓ Similar to DB ✓Usually unfunded

- **The key to identify DC or DB:**
  - Who bear the investment risk
  - How about the employer's future obligation.
- **OPB could be regarded as an extension of DB;**

Illustration of DB



- The payment of pension after the retirement is committed by the firm. Therefore, these cost should be recognized during the servicing period of the employees. The present value of the cost as at the end of current year is called PBO
- The firm (sponsor) usually set up a fund to meet the liability.

Illustration of DB

➢ **Key Terminology**

Effect on	Definition	Calculation Base/Assumptions
Projected Benefit Obligation (PBO) Under US GAAP	the actuarial present value of all benefits attributed by the plan's benefit formula to employee service rendered prior to that date.	✓ expected future salary increases. ✓ Going concern ✓ Employee's continued service.
Accumulated Benefit Obligation (ABO)	the actuarial present value of benefits attributed to employee service rendered prior to that date and based on current and past compensation levels.	✓ Current compensation levels (ignoring future increases.) ✓ Liquidation of pension obligation.
Vested Benefit Obligation (VBO)	The amount of ABO to which the employee is entitled.	✓ ABO ✓ Vesting schedule

➢ Known as **present value of defined benefit obligation (PVDBO)** under IFRS

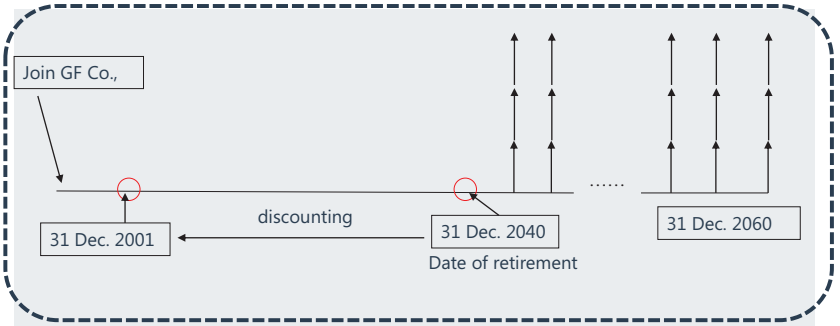
Illustration of DB

➢ **A typical DB plan – Example 1**

➢ John joins GF Co. on 1 January 2001 when he was 20. He the only one who are entitled to DB plan. In the plan, any 1 year of service by John, GF Co. agrees to pay a 1% at the salary for the year he retires until his death. The current salary of John for 2001 is $50,000 and is expected to increased to $200,000 when he retires at his 60 in accordance with salary increase trend. The expected life of John is 80.

- How much will GF Co., pay to John annually when he retires?
- What's the obligation as of 31 December 2001, 2002 and 2003?
- How is the PBO at those days? (assuming discount rate of 10%);

Illustration of DB



➢ For 1 year service, GF Co., should pay John additional $2,000 annually when he retires;

➢ If John retires at his 60, GF Co., should pay John $80,000 annually until his death (20 years after his retirement);

Illustration of DB

	As of 31 December,		
	2001	2002	2003
PV of obligation earn by John when he retires			
PMT	2,000	4,000	6,000
N	20	20	20
I/Y	10%	10%	10%
PV as of 31 Dec. 2040	17,027	34,054	51,081
Discounting to every Y/E			
Service periods (years)	39	38	37
PBO	414	910	1,502
Calculation of ABO			
PMT	500	1,000	1,500
PV as of 31 Dec. 2040	4,257	8,514	12,770
ABO	103	228	376

50k*1%

- PBO is a liability of the firm in term of DB plan;
- Firms usually set funds to meet the liabilities of DB plan, these funds are assets of the firms (the plan assets);
- On the B/S, PBO and the fair value of plan assets are recognized with net amount;

Balance sheet presentation

- **Both IFRS and US GAAP require a pension plan's funded status to be reported on the balance sheet.**
- **Funded status**
  - = Fair value of the plan assets - PV of the Defined benefit obligation.
  - If the plan has a deficit, an amount equal to the net underfunded pension obligation is reported on the balance sheet as a net pension liability.
  - If the plan has a surplus, an asset equal to the overfunded pension obligation is reported on the balance sheet as a net pension asset
    - ✓ subject to a ceiling defined as the present value of future economic benefits, such as refunds from the plan or reductions of future contributions).

Example

- For company ABC, the present value of the company's defined benefit obligation is €6,723 and the fair value of the pension plan's assets is €4,880.
- For company DEF, the present value of the company's defined benefit obligation is €5,485 and the fair value of the pension plan assets is €5,998. In addition, the present value of available future refunds and reductions in future contributions is €326.
- For ABC
  - Company ABC would report the full underfunded status of its pension plan as a liability: €4,880 - €6,723=- €1,843.
- For DEF
  - Company DEF's pension plan is overfunded by €513 (€5,998 - €5,485).
  - However, when a company has a surplus in a defined benefit plan, the amount of asset that can be reported is the lower of the surplus and the asset ceiling of €326,
  - so the amount of company DEF's reported net pension asset would be limited to €326.

Funded Status of a Pension Plan

Plan Assets

Fair value at the beginning of the year

(+) Employer Contributions

(+) Actual return

(-) Benefit paid to employee

= Fair value at the end of the year

PBO

PBO at the beginning of the year

(+) Current service cost

(+) Interest cost

(+) Past service cost (plan amendments during the year)

(+) Actuarial losses

(-) Actuarial gains during the year

(-) Benefit paid to employee

= PBO at the end of the year

Difference is funded status of the plan
Plan asset > PBO—>Overfunded plan
Plan asset < PBO—>Underfunded plan

Assumptions of defined benefit obligation

- **The firm discloses three assumptions:**
  - **Discount rate**: the interest rate used to compute the PV of the benefit obligation and the current service cost component of pension expense. Based on interest rates of high quality corporate fixed income investments with a maturity profile similar to the future obligation. Affects the PBO as well as pension expense.
  - **Rate of compensation growth**: is the average annual rate by which employee compensation is expected to increase over time.
  - **Expected vesting rate**: refers to a provision in pension plans whereby an employee gains rights to future benefits only after meeting certain criteria.
    - ✓ Such as: pre-specified number of years of service
      - ◆If the employee leaves the company before meeting the criteria, he or she may be entitle to none or a portion of the benefits.

Assumptions of defined benefit obligation

- An estimate of future compensation is made if the pension benefit formula is based on future compensation levels, examples include:
  - Pay-related plan
  - Final-pay plan
  - Final-average-pay plan
  - Career-average-pay plan
- In our CFA curriculum, we mostly take the final - pay plan.

Periodic pension cost - US GAAP

- The periodic pension cost is recognized in profit or loss (P&L) and/ or in other comprehensive income (OCI).
  - Current service cost: is the present value of benefits earned by the employees during the current period.
  - Interest cost: is the increase in the PBO due to the passage of time. It is calculated by multiplying the PBO at the beginning of the period by the discount rate.
  - Expected return on plan asset: the expected return on plan assets reduces pension expense.
  - Amortization of actuarial gains and losses: An increase or decrease in the PBO **from a change in actuarial assumptions** is combined with the deferred gains and losses that result from the **difference between the expected return and actual return** on plan assets.

Example – current service cost

- **Current Service cost:** Increase in Pension obligation due to service of employees. It is recognized on I/S as expenses directly.
  - Consider Example 1, what the service cost in year 2001, 2002 and 2003?

	For the year		
	2001	2002	2003
Obligation assumed by GF due John's current year service			
PMT	2,000	2,000	2,000
N	20	20	20
I/Y	10%	10%	10%
PV as of 31 Dec. 2040	17,027	17,027	17,027
Discounting to every Y/E			
Future service periods (years)	39	38	37
Service cost	414	455	501

Example – interest cost

- **Interest cost**
  - Interest accrued on beginning PBO during the period. It is recognized on I/S as expenses directly.
  - Consider Example 1, what the interest cost in year 2001, 2002 and 2003?

	As of 31 December,		
	2001	2002	2003
PBO at beginning	0	414	910
Discounting rate	10%	10%	10%
Interest cost	0	41	91
Service cost	414	455	501
Y/E PBO	414	910	1,502

414+41+455 = 910

910+91+501 = 1502

Periodic pension cost - US GAAP

- **Under U.S. GAAP**
  - the periodic pension costs recognised in P&L include
    - ✓ current service costs,
    - ✓ interest expense on plan liabilities,
    - ✓ expected returns on plan assets (which is a reduction of the cost),
    - ✓ the amortisation of past service costs, and actuarial gains and losses **to the extent not reported in OCI**
  - Amortization
    - ✓ Actuarial gains and loss are amortized using the corridor approach
      - ◆Once the beginning balance of actuarial gains and losses exceed 10% of the greater of the beginning PBO or plan assets, amortization is required. Company can choose to amortize actuarial gains and losses more quickly than implied by the corridor method (must be consistent).
    - ✓ Amortization of past service costs: under US GAAP, it is reported as a part of OCI and amortized over the remaining service life of the affected employees.

Examples—Corridor approach

- Example: Assume that the beginning balance of the PBO is $5,000,000, the beginning balance of fair value of plan asset is $4,850,000, and the beginning balance of unrecognised actuarial losses is $610,000. The expected average remaining working lives of the plan employee is 10 years.
  - The corridor is $500,000, which is 10% of the PBO (selected as the greater of the PBO or the fair value of plan assets).
  - Because the balance of unrecognised actuarial losses exceeds the $500,000 corridor, amortisation is required.
  - The amount of the amortisation is $11,000, which is the excess of the unrecognised actuarial loss over the corridor divided by the expected average remaining working lives of the plan employees [($610,000-$500,000)/10 years]

Periodic pension cost - IFRS

- **The periodic pension cost is recognised in profit or loss (P&L) and/ or in other comprehensive income (OCI). IFRS and U.S. GAAP differ in the way that the periodic pension cost is divided between P&L and OCI.**
  - Service cost:
    - ✓ Current service cost is the amount by which a company's pension obligation increases as a result of employees' service in the current period.
    - ✓ Past service cost is the amount by which a company's pension obligation relating to employees' service in prior periods changes as a result of plan amendments or a plan curtailment.
    - ✓ Under IFRS, service costs (including both current service costs and past service costs) are recognised as an expense in P&L.

Periodic pension cost - IFRS

- **The periodic pension cost is recognised in profit or loss (P&L) and/ or in other comprehensive income (OCI). IFRS and U.S. GAAP differ in the way that the periodic pension cost is divided between P&L and OCI.**
  - Net interest expense/income:
    - ✓ calculated by multiplying the net pension liability or net pension asset by the discount rate used in determining the present value of the pension liability.
    - ✓ Under IFRS, the net interest expense/income is recognised in P&L.
  - Remeasurement:
    - ✓ includes (a) actuarial gains and losses and (b) any differences between the actual return on plan assets and the amount included in the net interest expense/income calculation.
    - ✓ Under IFRS, remeasurement amounts are recognised in OCI. Remeasurernent amounts are not subsequently amortised to P&L.

Periodic pension cost - IFRS

- **Under IFRS：**
  - The periodic pension costs recognised in P&L include
    - ✓ service costs (both current and past)
    - ✓ net interest expense/income. (+ interest cost – expected return)
  - The periodic pension costs recognised in OCI
    - ✓ include remeasurements that comprise
      - ◆**net return on plan assets (actual return–plan asset*interest rate)**
      - ◆actuarial gains and losses.
    - ✓ **Actuarial gains and losses are not amortized to P & L**
  - Expected return on plan assets has no effect on the pension obligation, but reduces pension expenses.
    - ✓ **Under IFRS**, the expected return on plan assets is implicitly assumed to be the same as the discount rate used for computation of pension obligation. The difference in the expected return and the actual return is combined with "actuarial gains and losses" account.

Periodic pension cost - Comparison

- **Under U.S. GAAP**
  - Similar to IFRS
    - ✓ **current service cost** is recognised in P&L.
    - ✓ the periodic pension cost for P&L includes **interest expense** on pension obligations (which increases the amount of the periodic cost) and **returns on the pension plan assets** (which reduce the amount of the periodic cost).

Periodic pension cost - Comparison

- **Under U.S. GAAP**
  - Unlike IFRS
    - ✓ **Past service costs** are reported in OCI, and in subsequent periods, these past service costs are amortised to P&L over the average service lives of the affected employees.
    - ✓ **Interest expense** and **returns on assets** are not presented in net value and returns on plan assets use an expected return rather than the actual return.
      - ◆Differences between the expected return and the actual return on plan assets represent another source of actuarial gains or losses.
      - ◆As noted, actuarial gains and losses can also result from changes in the actuarial assumptions used in determining the benefit obligation.

Components of a Company's DBP Periodic Costs

IFRS Component	IFRS Recognition	U.S. GAAP Component	U.S. GAAP Recognition
Service costs	Recognised in P&L. (both current and past)	Current service costs Past service costs	Current Recognised in P&L. Past Recognised in OCI and subsequently amortised to P&L over the service life of employees.
Net interest income/ expense	Recognised in P&L as the following amount: Net pension liability or asset * interest rate	Interest expense on pension obligation Expected return on plan assets	Recognised in P&L. Recognised in P&L as the following amount : Plan assets * expected return.
Remeasurements: Net return on plan assets and actuarial gains and losses	Recognised in OCI and not subsequently amortised to P&L Net return on plan assets = actual return – (plan assets * interest rate) Actuarial G&L = Changes in a company's pension obligation arising from changes in actuarial assumptions	Actuarial G&L including differences between the actual and expected returns on plan assets	Recognised in P&L as the following amount : Plan assets * expected return. Recognised immediately in P&L or, more commonly, recognised in OCI and subsequently amortised to P&L using the corridor or faster recognition method. Difference between expected and actual return on assets = actual return – plan assets * expected return Actuarial G&L = Changes in a company's pension obligation arising from changes in actuarial assumption

Recognition of components of pension cost

Component	US GAAP	IFRS
Current service cost	I/S	I/S
Past service cost	OCI, amortized over service life	I/S
Interest cost	I/S	I/S
Expected return	I/S	I/S
Actuarial gains/losses	Amortized portion in I/S Unamortized in OCI.	All in OCI— not amortized (called "remeasurements")

Period pension expense computation

- **Under GAAP**
  - Period pension expense recognized in P&L = current service cost + **interest cost** – expected return on plan assets + **amortization of past service cost** - amortization of actuarial gains (and + losses)
    - ✓ The following two parts are recognized in OCI
      - ◆Unamortized past service cost
      - ◆Actuarial gains/losses and Difference between expected return and actual return on plan assets.

Period pension expense computation

- **Under IFRS**
  - Period pension expense recognized in P&L
    = current service cost + **net interest cost** +**past service cost**
    - ✓ Under IFRS, actuarial gains and losses are not amortized in OCI
    - ✓ Any difference between actual return and "expected return" (discount rate * FV_B) is recognized in OCI
  - Period pension expense recognized in OCI = actuarial gains and losses on the pension obligation + net return on plan assets.
    - ✓ net return on plan assets = actual return–plan asset*interest rate

Assumptions

- **The firm discloses three assumptions:**
  - **Discount rate**: the interest rate used to compute the PV of the benefit obligation and the current service cost component of pension expense. Based on interest rates of high quality corporate fixed income investments with a maturity profile similar to the future obligation. Affects the PBO as well as pension expense.
  - **Rate of compensation growth:** affects both the PBO and pension expense.
  - **Expected return on plan assets**: assumed long-term rate of return on the plan's investments. The expected return reduces pension expense and the difference between the expected return and actual return are deferred.
    - ✓ The expected return is assumed only under US GAAP.
    - ✓ Under IFRS, equal to the discount rate.

Effect of changing pension assumption

- **Increasing the discount rate:**
  - Reduce PV; PBO is lower; improve the funded status.
  - Usually result in lower pension expense because of lower service cost. (the current service cost is a PV calculation)
  - Usually reduce interest cost (PBO * discount rate) unless the plan is mature.
- **Decreasing the compensation growth rate:**
  - Reduce future pension payments; PBO is lower; improve the funded status.
  - Reduce current service cost and lower interest cost; pension expense will decrease.
- **Increasing the expected return on plan assets (under US GAAP)**
  - Reduce pension expense
  - Not affect the benefit obligation or the funded status.

Effect of changing pension assumption

Effect on:	Increase discount rate	Decrease rate of compensation growth	Increase expected rate of return
Balance sheet liability	Decrease	Decrease	No effect
Pension expense	Decrease (not mature plan)	Decrease	Decrease (US GAAP only)

Other post-employment benefits

- The assumptions are similar for other post-employment benefits expect the compensation growth rate is replaced by a healthcare inflation rate. Generally, the presumption is the inflation will taper off and eventually become constant. This constant rate is known as the **ultimate healthcare trend rate.**
- All else equal, firms can reduce the post-employment benefit obligation and periodic expense by
  - Decreasing the near term healthcare inflation rate,
  - Decreasing the ultimate healthcare trend rate or
  - Reducing the time needed to reach the ultimate healthcare trend rate.

Other post-employment benefits

- Holding all else equal, each of the following assumptions would result in a higher benefit obligation and a higher periodic cost:
  - A higher assumed near-term increase in health care costs.
  - A higher assumed ultimate health care trend rate.
  - A later year in which the ultimate health care trend rate is assumed to be reached.
- Conversely, holding all else equal, each of the following assumptions would result in a lower benefit obligation and a lower periodic cost:
  - A lower assumed near-term increase in health care costs.
  - A lower assumed ultimate health care trend rate.
  - An earlier year in which the ultimate health care trend rate is assumed to be reached.

Analyst view: Disclosures

- **Several aspects of the accounting for pensions and other post-employment benefits can affect comparative financial analysis using ratios based on financial statements.**
  - Differences in key assumptions can affect comparisons across companies.
  - Amounts disclosed in the BS are net amounts (plan liabilities - plan assets). Adjustments to incorporate gross amounts would change certain financial ratios.
  - Periodic pension costs may not be comparable. IFRS and U.S. GAAP differ in their provisions about costs recognised in P&L versus in OCI.

Analyst view: Disclosures

- **Several aspects of the accounting for pensions and other post-employment benefits can affect comparative financial analysis using ratios based on financial statements.**
  - Reporting of periodic pension costs in P&L may not be comparable. Under U.S. GAAP, all of the components of pension costs in P&L are reported in operating expense on the income statement even though some of the components are of a financial nature (specifically, interest expense and the expected return on assets). However, under IFRS, the components of periodic pension costs in P&L can be included in various line items.
  - Cash flow information may not be comparable. Under IFRS, some portion of the amount of contributions might be treated as a financing activity rather than an operating activity; under U.S. GAAP, the contribution is treated as an operating activity.

Pension disclosure – Assumptions

- **Evaluating the disclosure - assumptions**
  - Sponsoring company discloses following assumptions:
    - ✓ Discount rate;
    - ✓ Expected compensation increases;
    - ✓ Medical expense inflation;
    - ✓ Expected return on plan assets.
  - Analyst should evaluate these assumptions, whether these assumptions:
    - ✓ Consistent with other comparable companies;
    - ✓ Consistent with economic environment;
    - ✓ Consistent internally;

Analyst view: Net Pension Liability (or Asset)

- Under both IFRS and U.S. GAAP standards, the amount disclosed in the balance sheet is a net amount.
- Analysts can use information from the notes to adjust a company's assets and liabilities for the gross amount of the benefit plan assets and the gross amount of the benefit plan liabilities.
- An argument for making such adjustments is that they reflect the underlying economic liabilities and assets of a company; Actual consolidation is precluded by laws protecting a pension or other benefit plan as a separate legal entity.
- At a minimum, an analyst will compare the gross benefit obligation (i.e., the benefit obligation without deducting related plan assets) with the sponsoring company's total assets, including the gross amount of the benefit plan assets, shareholders' equity, and earnings. If the gross benefit obligation is large relative to these items, a small change in the pension liability can have a significant financial impact on the sponsoring company.

Analyst view: Total periodic pension costs

- The total periodic cost of a company's DB pension plan is the change in the net pension liability or asset, excluding the effect of the employer's periodic contribution into the plan.
- Net periodic pension cost (i.e. total period pension cost)

  = (Ending funded status – Beginning funded status) - employer's contribution
- The payment of cash out of a DB plan to a retiree does not affect the net pension liability or asset. Payment of cash out of a DB plan to a retiree reduces plan assets and plan obligations in an equal amount.

Example—total periodic pension expense

XYZ SA retirement plan information	
Employer contribution	1,000
Current service costs	200
Past service costs	120
Discount rate used to estimate plan liabilities	7%
Benefit obligation at beginning of year0	42,000
Benefit obligation at the end of year	41,720
Actuarial loss due to increase in plan obligation	460
Plan assets at beginning of year	39,000
Plan assets at end of year	38,700
Actual return on plan assets	2,700
Expected rate of return on plan assets	8%

- The retirement benefit paid?
- Total periodic cost?
- Period pension cost in P&L if under IFRS?
- Period pension cost in OCI if under IFRS?

Example—total periodic pension expense

- The retirement benefits paid during the year were closest to 4,000.
  - Benefit paid =The beginning obligation + current and past service costs + interest expense + increase in obligation due to actuarial loss - ending obligation equals benefits paid
    - ✓ = 42,000 + 200 + 120 + (42,000 * 0.07) + 460 - 41,720 = **4,000**
  - Alternatively, Benefit paid = Beginning plan assets + contributions + actual return on plan assets - ending plan assets equals benefits paid
    - ✓ = 39,000 + 1,000 + 2,700 - 38,700 = **4,000**
- The total periodic pension cost is the change in the net pension liability adjusted for the employer's contribution into the plan, which equal to:
  - **Ending funded status–Beginning funded status–employer's contribution** The net pension liability increased from 3000 to 3,020, and the employer's contribution was 1,000. The total periodic pension cost is **1,020**. This will be allocated between P&L and OCI.

Example—total periodic pension expense

- Under IFRS, the components of periodic pension cost that would be reported in P&L are
  - **current service cost + net interest cost +past service cost**
    - ✓ the service cost (composed of current service cost and prior service cost) ,the net interest expense or income, calculated by multiplying the net pension liability or net pension asset by the discount rate used to measure the pension liability
    - ✓ So, 200 +120 + (42,000 - 39,000) *7% = **530.**
- Under IFRS, the component of periodic pension cost that would be reported in OCI are
  - **actuarial G/L on the pension obligation + net return on plan assets**
    - ✓ Here, the actuarial loss was 460. the actual return on plan assets was 2,700, which was 30 lower than the return of 2,730 (= 39,000 x 0.07). Therefore, the total amounts are **490.**

Analyst view: periodic pension cost

- An analyst comparing an IFRS-reporting company with a U.S. GAAP-reporting company could adjust the reported amounts of P&L to achieve comparability.
  - The analyst could adjust the U.S. GAAP company's P&L to make it similar to an IFRS company
    - ✓ by including past service costs arising during the period
    - ✓ excluding amortisation of past service costs arising in previous periods
    - ✓ including an amount of return on plan assets at the discount rate rather than the expected rate.
  - Alternatively, the analyst could use comprehensive income (net income from P&L plus OCI) as the basis for comparison.

Analyst view: classification

- Amounts of periodic pension costs recognised in P&L (pension expense) are generally treated as operating expenses. But it can be argued that only the current service cost component is an operating expense, whereas the interest component and asset returns are both non-operating.
  - The interest expense component of pension expense is conceptually similar to the interest expense on any of the company's other liabilities, which is essentially equivalent to borrowing from employees, and the interest expense of borrowing can be considered a financing cost.
  - The return on pension plan assets is conceptually similar to returns on any of the company's other financial assets, These classification issues apply equally to OPB costs.

Analyst view: classification

- To better reflect a company's operating performance, an adjustment can be made to operating income by adding back the full amount of pensions costs reported in the P/L (pension expense) and then subtracting only the service costs.
  - This adjustment excludes from operating income the amortisation of past service costs and the amortisation of net actuarial gains and losses.
  - This adjustment also eliminates the interest expense component and the return on plan assets component from the company's operating income.
  - The interest expense component would be added to the company's interest expense, and the return on plan assets would be treated as non-operating income.
  - Under either set of standards, an adjustment can incorporate the actual return, rather than expected return under US GAAP, or discount rate under IFRS.

Example: reclassifying pension expense

Partial Income Statement	
Operating profit	145,000
Interest expense	-12,000
Other income	2,000
Income before tax	135,000
Other data	
Current service cost	7,000
Interest cost	5,000
Expected return on assets	8,000
Actual return on assets	9,500

- Answer: Reported pension expense of $4,000 ($7,000 current service cost + $5,000 interest cost - $8,000 expected return on assets) is added back to operating profit.
- Then, service cost of $7,000 is subtracted from operating profit
- interest cost of $5,000 is added to interest expense
- and the actual return on assets of $9,500 is added to other income.

Partial Income Statement	Reported	Adjustments	Adjusted
Operating profit	145,000	+4,000-7,000	142,000
Interest expense	-12,000	-5,000	-17,000
Other income	2,000	+9,500	11,500
Income before tax	135,000		136,500

Analyst view – Cash flow

- **Cash flow impact: the amount of contribution and the amount of benefits paid.**
  - If a sponsoring company's periodic contributions to a plan exceed the total pension costs of the period, the excess can be viewed from an economic perspective as a reduction of the pension obligation.
  - Conversely, a periodic contribution that is less than the total pension cost of the period can be viewed as a source of financing.
  - Where the amounts of benefit obligations are material, an analyst may choose to adjust the cash flows that a company presents in its statement of cash flows.

Analyst view – Cash flow

- **Analysis of cash flow:** The key is to compare the contribution with total periodic pension expenses:
  - Overcontribution: contribution > total periodic pension costs;
    - ✓ CFO +(Contribution - TPPC)*(1-t),
    - ✓ CFF - (Contribution - TPPC)*(1-t), repayment
  - Undercontribution: contribution < total periodic pension expenses
    - ✓ CFO - (TPPC - Contribution)*(1-t),
    - ✓ CFF+ (TPPC - Contribution)*(1-t), borrowing
  - The gap is to be adjusted to CFF from CFO.

GAP	Adjustment on CFO	Adjustment on CFF	Classification
Overcontribution	Increase	Decrease	Repayment to funds
Undercontribution	Decrease	Increase	Borrowing from employee

Cash flow - Example

- BC Inc. has a defined benefit pension plan in place. The company made a $340 million contribution to the plan during the year. Beginning funded status: $2,530. Ending funded status: $2,180. BC reported a net income during the year of $812 million. CFO and CFF were reported as $948 million and $112 million respectively. Tax rate was 40%.
- Solution:
  - Periodic pension cost = (Ending funded status - Beginning funded status) - Employer contributions = (2180 – 2530) – 340 = - 690
  - After tax shortfall = (690 - 340)*(1-40%) = 210
  - Adjusted CFO = 948 – 210 = 738
  - Adjusted CFF = 112 + 210 = 322

Share-based compensation - Overview

- The plans provide employees the opportunity to receive stock tied to firm performance.
- Stock compensation plan takes many forms:
  - Stock options;
  - Stock grants;

  } Equity settled
  - Stock appreciation rights;
  - Phantom shares.

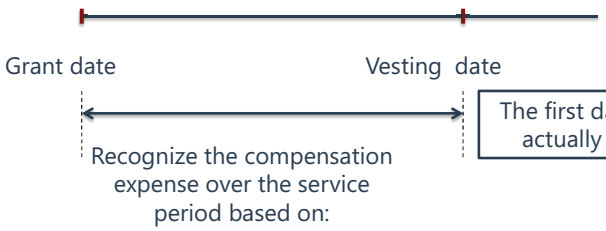
  } Cash settled, like cash bonus plan.

Share-based compensation - Overview

- Disadvantages of share-based compensation:
  - Do not provide desired incentives as the managers may have limited influence over the market value;
  - Lead managers to be risk averse or excessive risk-taking as they cares about the market value;
  - May dilute the shareholders' interests.

Share – based compensation

- Stock options – **Call option**



Fair value method
Fair value of the stock option at the grant date (An option pricing model can be used to determine the fair value of stock options)

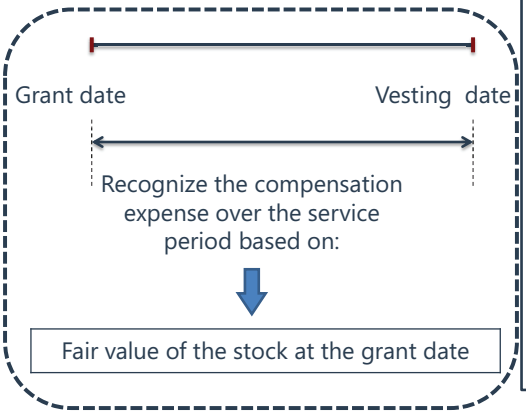
Share – based compensation

Sensitivity factor (Greek)	**Input** ↑	**Value of call**
Vega	Volatility (σ)	↑
Rho	Risk-free rate (r)	↑
Theta	Time to expiration (T)	↑
	Dividend	↓

- **Some points to note:**
  - Call Option在grant date 之后的公允价值变动与公司无关
  - 执行期权时，有减税效应（执行期权，确认compensation expense，费用增加，所得税费用减少，CFO增加）

Share – based compensation

- **Stock grants**



- Transfer of stock without condition
  → Vesting immediately at grant date
- Restricted stock
  → Transferred stock cannot be sold until vesting date
- Performance stock
  → Contingent on meeting performance goals (EPS, ROA, ROE, etc.)
  → May result in manipulation

Share-based compensation–accounting issues

- **Equity settled**
  - Fair value at grant date is the basic;
    - ✓ How the fair value is determined (refer to B-S model);
  - The fair value is amortized over the vesting period in accordance with vesting schedule:
    - ✓ The amortization is charged to I/S as an expense;
    - ✓ It also increase the APIC in equity.
- **Cash settled**
  - **Stock appreciation rights (SARs)**
    - ✓ Valued at fair value and compensation expense is allocated over the service period of the employee
  - Unlike SARs, the **phantom shares** can be used by private companies, highly illiquid companies or business units within a company that are not publicly traded.

Reading 18

Multinational Operations

Framework

1. Foreign currency transactions
2. Classification of currency
3. Translation of foreign currency FS
4. Translation of entity's FS in a hyperinflationary economy
5. Tax Implications of Multinational Operations
6. Revenue Growth Issue and Foreign Exchange Risks

Overview

- Foreign currency transactions
  - Treatment of transactions dominated in foreign currency;
- Translation of foreign operations
  - Companies may have foreign subsidiaries and operations. This section addresses how to reflect the results of foreign operating units in the consolidated financial statements of the multinational parent.
- Translation issues in hyperinflationary economies

They are different concepts

Foreign currency transactions

- Foreign currency is a currency other than functional currency.
- Foreign currency transactions refers to transactions occurs dominated in foreign currency.
- Treatment of foreign currency transactions:
  - Transactions in foreign currencies are translated into the functional currency at the exchange rates at the date of transactions;
  - Monetary assets and liabilities dominated in foreign currencies at the balance sheet date are re-valued at the exchange rate at that date;
  - Differences arising on the transactions are recognized on the I/S

Foreign currency transactions

- **Example – 1**
- GF Inc, sold US10,000 to a foreign customers with accounts receivable on 1 November 2008. the accounts receivable is collected on 31 January 2009. Assume the F/X exchange rate is as follows (RMB per USD):
  - 8.00 @ 1 November 2008;
  - 7.50 @ 31 December 2008;
  - 7.30 @ 31 January 2009.
  - No other transactions in 2008, what's balance of A/R as at 1 Nov 2008, 31 Dec 2008.
  - What's FX G/L in 2008 and 2009?

Foreign currency transactions

➢ **Example – 1**

Cash			
	73,000		
		R/E	
A/R		<sales>	80,000
	80,000	<cost>	(50,000)
	(5,000)	FX G/L	(5,000)
	(2,000)		(2,000)
	(73,000)		
Inventory			
	(50,000)		
	23,000		23,000

Income statement		
	FY08	FY09
Sales	80,000	0
COGS	(50,000)	0
GPM	30,000	0
FX G/L	(5,000)	(2,000)
PBT	25,000	(2,000)

Foreign currency transactions

➢ **Summary of impact due to changes in Foreign Currency**

Transactions	Types of Exposure	Foreign Currency	
		Appreciation	Depreciation
Export sales	Asset (A/R)	Gain	Loss
Import purchase	Liability (A/P)	Loss	Gain

Foreign currency transactions

Analytical issues and disclosure analysis

➢ Where is the FX G/L recognized on the I/S, operating or non-operating?

- Both IFRS and US GAAP require recognize the foreign transaction gain or loss on the I/S;
- However, neither standards indicates where on the I/S these G/L should be recognized;
- In practice, 2 most common treatments:
  - ✓ As an operating income or expense;
  - ✓ As a non-operating income or expense.

➢ The key analysis on disclosure is to identify where the FX G/L is recognized, operating or non-operating.

Classification of currency

Currency Classification	Definition	Adoption in FS
Local Currency	Currency of the country in which the entity is located.	The financial Statement prepared by the entity is usually in local currency (it's not the GAAP requirement but usually regulatory requirement)
Functional Currency	Currency of the primary economic environment in which the entity generates and expends cash.	The functional currency best reflects the "substance" of the subsidiary economic activities. In accordance with GAAP, the FS is recorded in functional currency
Reporting Currency/ Presentation currency	The currency in which the entity reports its financial statement	The entity's financial statement shall be finally converted to reporting currency based on specific reporting requirement

- **Functional currency is the key in foreign currency analysis.**

Translation of foreign currency FS

- **Overview**
  - Translation of foreign currency financial statements refers to the method used to translate the entity's financial statements to **Presentation Currency (reporting currency).**
  - The translation of foreign currency FS is a different with foreign currency transaction treatment.
  - Two methods are usually adopted in the translation under different scenarios:
    - ✓ Current rate method, and
    - ✓ Temporal method

Translation of foreign currency FS

- **Adoption of 2 methods**

Local Currency → (Re-measurement: Temporal Method) → Functional Currency → (Translation: Current rate Method) → Reporting Currency

Scenario	Treatment required	Applicable Method
Local currency is the functional currency	Translation only	Current rate method
Functional Currency is the Reporting currency	Re-measurement only	Temporal method
Neither of above	Both translation and re-measurement	Temporal method first, then current rate method

Translation of foreign currency FS

- **Comparison of 2 methods – applicable FX rate (1)**

B/S items	Rate under Temporal Method	Rate under Current Rate Method
Monetary Assets/Liabilities	Current	Current
Non-monetary assets/ Liabilities (inventories, FA, unearned revenue)	Historical	Current
Capital	Historical	Historical
R/E	Balancing	Balancing
Equity (as a whole)	Mixed (because the change in retained earnings is mixed)	Current

- **Note: Liability is usually regarded as monetary.**

Translation of foreign currency FS

- **Comparison of 2 methods – applicable FX rate (2)**

I/S items	Rate under Temporal Method	Rate under Current Rate Method
Sales and other expenses	Average	Average
COGS	Historical	Average
Depreciation	Historical	Average
Revenue and other expenses	Average	Average
Translation G/L	Recognized on I/S (Affecting retained earnings, no CTA)	Recognized in **equity** (B/S, not through I/S) resulting in **CTA** (cumulative translation adjustment)

Translation of foreign currency FS

Several special items – inventories & COGS under temporal method

- Under Temporal Method, the inventories are re-measured at historical FX rate. The ending inventories are re-measured at the rate that existed when the inventories assumed to still be on hand at the B/S date was acquired.
  - Under FIFO, the ending inventories are re-measured at relatively recent rate;
  - Under LIFO, the ending inventories are re-measured at relatively older rate
- Therefore, the FX rate used in re-measuring the COGS will differ depending on the cost flow assumption, FIFO, LIFO and weighted average. The COGS is re-measured at the rate that existed when the inventories assumed to have been sold during the year were acquired.

Translation of foreign currency FS

Several special items – retained earnings (1)

- Retained earnings on the FS should be balanced:
  - Beginning R/E + Net income – Dividends = Ending R/E
- The translated R/E should also meet the above equation.
- Under Current Rate Method, the R/E is derived as follows:

Items in reporting currency	Sources
Beginning R/E	From L/Y's transaltion
+ Net Income	**Translated NI from I/S**
- Dividends	Translated at historical rate at date of declaratior
Ending R/E	Balancing

The translated NI equals to the NI in local currency multiplied by average F/X rate which is also used in translation of the whole I/S.

The amount we are going to calculate

Translation of foreign currency FS

Several special items – retained earnings (2)

- Under Temporal Method, the re-measured NI could not be derived from re-measured I/S directly as the translation G/L on I/S could not be calculated directly. The following procedures are used to figure out the key re-measured amount:
  - When all the assets and liabilities are re-measured, we can obtain the ending re-measured R/E which is a balancing figure on B/S;
  - Based on the R/E equation, we can calculate the re-measured NI;
  - When all other items of I/S are re-measured, the F/X translation G/L is derived from the balancing of re-measure NI and other re-measured I/S

Items in functional currency	Sources
Ending R/E	Balancing from re-measured B/S
- Beginning R/E	From L/Y's transaltion
+ Dividends	Translated at historical rate at date of declaratior
+ Net Income	Balancing

Translation of foreign currency FS

- **Treatment of translation G/L under 2 methods**
  - Under current rate method:
    - ✓ presented in Cumulative Translation Adjustment (CTA) on B/S (equity section).
    - ✓ This is a cumulative account, gain/loss of a specific year is added/subtracted to/from beginning CTA.
    - ✓ I/S unaffected.
    - ✓ As part of comprehensive income.
  - Under Temporal method:
    - ✓ recognized on I/S.

Example: current rate method

- FlexCo International is a U.S. company with a subsidiary, Vibrant, Inc., located in the country of Martonia. Vibrant was acquired by FlexCo on 12/31/2014. FlexCo reports its financial results in U.S. dollars. The currency of Martonia is the loca (LC). Vibrant's financial statements for 2015 are shown in the following two figures.
- **Vibrant December 31, 2014 and 2013 Balance Sheet**

	2014	2015
Cash	LC100	LC100
Accounts receivable	500	630
Inventory	1,000	1,200
Current assets	LC 1,600	LC1,950
Fixed assets	800	1,600
Accumulated depreciation	(100)	(700)
Net fixed assets	LC700	LC900
Total assets	LC2,300	LC2,850

Example: current rate method

Accounts payable	400	500
Current debt	100	200
Long-term debt	1,300	950
Total liabilities	LC 1,800	LC 1,650
Common stock	400	400
Retained earnings*	100	800
Total equity	LC500	LC 1,200
Total liabilities and equity	LC2,300	LC2.850

*Retained earnings on December 31, 2014, were $30.

Vibrant 2015 Income Statement

	2015
Revenue	LC5,000
Cost of goods sold	(3,300)
Gross margin	1,700
Other expenses	(400)
Depreciation expense	(600)
Net income	LC700

Example: current rate method

- The following exchange rates between the U.S. dollar and the loca were observed:
  - December 31, 2014: $0.30 = LC1.00.
  - December 31, 2013: $0.4545 = LC1.00.
  - Average for 2015: $0.4762 = LC1.00.
  - Historical rate for equity: $0.50 = LC1.00.
  - Historical rate for fixed assets: $0.4881 = LC1.00.
  - Historical rate for accumulated depreciation = $0.4896 = LC1.00.
  - Historical rate for COGS = $0.4834 = LC1.00.
  - Historical rate for depreciation = $0.4878 = LC1.00.
  - Historical rate for ending inventory = average rate during the year (for this example).
- The majority of Vibrant's operational, financial, and investment decisions are made locally in Martonia, although Vibrant does rely on FlexCo for information technology expertise.
- Use the appropriate method to translate Vibrant's 2015 balance sheet and income statement into U.S. dollars.

Example: current rate method

- **Answer:**
- Vibrant is relatively self-contained, which likely means the loca is the functional currency. Since the functional currency the parent's presentation currency, the current rate method is used to translate Vibrant's financial statements from the functional currency to the parent's presentation currency. The current rate method uses the current rate for all balance sheet accounts (except common stock, which is translated at the historical rate) and the average rate for all income statement accounts. The translation gain or loss is included in the CTA, which is reported in the equity section of the balance sheet as a part of other comprehensive income.
- Vibrant's translated 2015 income statement is shown in the following table. Notice that we translate the income statement first with the current rate method to derive net income, which wc then use to calculate retained earnings on the balance sheet.

Example: current rate method

- Vibrants 2015 Translated Income Statement Under the Current Rate Method

	2015 (LC)	Rate	2015 ($)
Revenue	LC5,000	$0.4762	$2,381.0
Cost of goods sold	(3,300)	$0.4762	(1,571.5)
Gross margin	1,700		809.5
Other expenses	(400)	$0.4762	(190.5)
Depreciation expense	(600)	$0.4762	(285.7)
Net income	LC700		$333.3

- Vibrant's 2015 translated balance sheet is shown in the next table.

Example: current rate method

	2015 (LC)	Rate	2015 ($)
Cash	LC100	$0.4545	$45.5
Accounts receivable	650	$0.4545	295.4
Inventory	1,200	$0.4545	545.4
Current assets	LC 1,950		$886.3
Fixed assets	1,600	$0.4545	727.2
Accumulated depreciation	(700)	$0.4545	(318.2)
Net fixed assets	LC900		$409.0
Total assets	LC2.850		$1,295.3
Accounts payable	500	$0.4545	227.2
Current debt	200	$0.4545	90.9
Long-term debt	950	$0.4545	431.8
Total liabilities	LC 1,650		$749.9
Common stock	400	$0.50	200.0
Retained earnings	800	(a)	383.3
Cumulative translation adjustment	—	(b)	(37.9)
Total equity	LC 1,200		$545.4
Total liabilities and shareholders' equity	LC2,850		$1,295.3

Example: current rate method

a) Beginning (2015) retained earnings were $50, so ending (2015) retained earnings are $50 + $333.3 = $383.3.

b) The CTA is a plug figure that makes the accounting equation balance: $1,295.3 assets -$749.9 liabilities - $200.0 common stock - $383.3 retained earnings = -$37.9.

- Notice the change in the CTA from 2014 to 2015 is equal to -$37.9 (-$37.9 ending CTA - $0 beginning CTA). Because Vibrant was acquired at the end of 2014, the CTA was zero on that date. Thus, the depreciating loca resulted in translation loss of $37.9 for the year ended 2015. The translation loss occurred because Vibrant had a net asset exposure (assets > liabilities) and the loca depreciated relative to the dollar.

Example: The temporal method

- Suppose instead that the majority of Vibrant's operational, financial, and investment decisions are made by the parent company, FlexCo. In this case, Vibrant's functional currency and FlexCo's presentation currency are likely the same; thus, the temporal method is used to remeasure the loca to the dollar. All other information is the same.
- Use the appropriate method to translate Vibrant's 2015 balance sheet and income statement into U.S. dollars.
- Under the temporal method, we'll start with the balance sheet.
- **Vibrant 2015 Remeasured Balance Sheet Under the Temporal Method**

Example: Temporal method

	2015 (LC)	Rate	2015 ($)
Cash	LC100	$0.4545	$45.5
Accounts receivable	650	$0.4545	295.4
Inventory	1,200	$0.4545	571.4
Current assets	LC 1,950		$912.3
Fixed assets	1,600	$0.4545	781.0
Accumulated depreciation	(700)	$0.4545	(342.7)
Net fixed assets	LC900		$438.3
Total assets	LC2.850		$1,350.6
Accounts payable	500	$0.4545	227.2
Current debt	200	$0.4545	90.9
Long-term debt	950	$0.4545	431.8
Total liabilities	LC 1,650		$749.9
Common stock	400	$0.50	200.0
Retained earnings	800	(a)	400.7
Total equity	LC 1,200		600.7
Total liabilities and shareholders' equity	LC2,850		$1,350.6

Example: Temporal method

- (a) Retained earnings is a plug figure that makes the accounting equation balance: $1,350.6 assets - $749.9 liabilities - $200.0 common stock = $400.7 retained earnings.
- Vibrant's remeasured income statement using the temporal method is shown in the following table. Remember the remeasurement gain or loss appears in the income statement under the temporal method.
- **Vibrant's 2015 Remeasured Income Statement Under the Temporal Method**

	2015 (LC)	Rate	2015 ($)
Revenue	LC5.000	$0.4762	$2,381.0
Cost of goods sold	(3,300)	$0.4834	(1,595.3)
Gross margin	1,700		785.7
Other expenses	(400)	$0.4762	(190.5)
Depreciation expense	(600)	$0.4878	(292.7)
Income before remeasurement gain	700		302.5
Remeasurement gain	—	(b)	48.2
Net income	LC700	(a)	$350.7

Example: Temporal method

a) Net income is derived from the beginning and ending balances of retained earnings and dividends paid: ($50.0 beginning balance + net income - $0 dividends paid = $400.7 ending balance). Solving tor net income, we get $350.7.

b) The remeasurement gain is a plug that is equal to the difference in net income and incom< before remeasurement gain: $350.7 - $302.5 = $48.2.

- The remeasurement gain occurred because Vibrant had a net monetary liability exposure (monetary liabilities > monetary assets), and the loca depreciated relative to the dollar.

Translation of foreign currency FS

Exposure to translation

- The translation G/L is due to the exposure of assets and liabilities which are translated (or re-measured) at the ending FX rate.
- The exposure under each method is summarized as follows:
  - Temporal method:
    - ✓ the exposure = monetary assets – monetary liabilities
  - Current rate method:
    - ✓ the exposure = shareholders' equity.

  Flow effect (in $) = change in exposure (in LC) * (ending rate – average rate)

  Holding gain/loss effect (in $) = beginning exposure (in LC) * (ending rate – beginning rate)

  Translation gain/loss (in $) =flow effect + Holding gain/loss effect 参考用
- The effect of FX translation G/L due to the changes in FX rate is similar with that in foreign currency transaction

Translation of foreign currency FS

- **Summary of financial ratios under current rate method - the subsidiary**

Scenario	Pure B/S and pure I/S ratios (compared with original subsidiary's)	B/S and I/S mix ratios (compared with original subsidiary's)
LC appreciating	The same (current ratio, quick ratio, LTD-to-capital)	✓ROA: Lower ✓ROE: Lower ✓Turnovers: Lower
LC depreciating	The same (current ratio, quick ratio, LTD-to-capital)	✓ROA: Higher ✓ROE: Higher ✓Turnovers: Higher

Translation of foreign currency FS

- **Comparison of ratios under 2 methods**

LC Depreciation	Temporal	Current Rate
Current ratio	Higher	Lower
Quick ratio	Same	Same
A/R turnover	Same	Same
Inventory turnover (LIFO FIFO uncertain)	Uncertain	Uncertain
Fixed Asset turnover	Lower	Higher
Gross profit margin	Lower	Higher
Net profit margin, ROE, ROA (translation gain/loss uncertain)	Uncertain	Uncertain
Interest coverage	Lower	Higher
LTD-to-Total capital	Lower	Higher (equity used Mixed rate)

Translation of entity's FS

- Hyperinflation Economies
  - 3 years and > cumulative 100% depreciation; (26%)
- Under US GAAP
  - Temporal method is adopted as if the parent's currency is the functional currency.
- Under IFRS (the foreign currency financial statements are restated for inflation and then translated using the current exchange rate.)
  - Monetary assets and liabilities are translated at ending rate;
  - Non-monetary assets and liabilities are restated for changes in the general purchasing power of the monetary unit;
  - All components of equity are restated by applying the change in the general price level from the beginning of the period;
  - All I/S items are restated by applying the changes in the general price index from the dates when the items were originally recorded to the B/S date;
  - The net G/L in purchasing power that arise from holding monetary assets and liabilities during a period of inflation is included in net income

Example: adjusting FSs for inflation

- Imagine that a foreign subsidiary was created on December 31, 2014. The LC is the currency of the country where the foreign subsidiary is located. The subsidiary'; balance sheets for 2014 and 201 3, and income statement for the year-ended 201 5, shown below:

(in LCs)	2014	2015
Cash	5,000	8,000
Supplies	25,000	25,000
Total assets	30,000	33,000
Accounts payable	20,000	20,000
Common stock	10,000	10,000
Retained earnings	0	3,000
Liabilities and equity	30,000	33,000
Revenue		15,000
Expenses		(12,000)
Net income		3,000
Also, use the following price indices:		
December 31, 2014	100	
December 31, 2015	150	
Average for 2015	125	

Example: adjusting FSs for inflation

- Prepare an inflation adjusted balance sheet and income statement for 2015- Answer:

(in LCs)	2015	Adjustment Factor	Inflation Adjusted
Cash	8,000		8,000
Supplies			
Total assets	25,000	150 / 100	37,500
Accounts payable	33,000		45,500
Common stock	20,000		20,000
Retained earnings	10,000	150 / 100	15,000
Liabilities and equity	3,000		10,500
Revenue	33,000		45,500
Expenses	15,000	150 / 125	18,000
Net purchasing power gain	(12,000)	150 / 125	(14,400)
			6,900
Net income	3,000		10,500

Tax Implications of Multinational Operations

- Earnings of multinational companies are subject to multiple tax jurisdictions; hence, the **statutory tax rate** often differs from the **effective tax rate**.
- Changes in effective tax rate on account of foreign operations can be due to:
  - Changes in the mix of profits from different countries (with varying tax rates).
  - Changes in the tax rates.

Example: analysis of reconciliation of ETR

- The reconciliation between the statutory tax rate and effective tax rate for two companies (Alpha & Beta) for the year 2013 is provided below:

Item	Alpha	Beta
Statutory tax rate	25.0%	30.0%
Effect of disallowed expenses	3.0%	1.0%
Effect of exempt income	(2.0%)	(0.5%)
Effect of taxes in foreign jurisdictions	3.4%	(1.2%)
Effect of recognition of prior losses	(0.8%)	(3.0%)
Effective tax rate	28.6%	26.3%

- Which company benefited from the lowering of tax expense on account of its foreign operations? (Beta)
- If the mix of foreign operations for both companies is expected to increase over time, which company is most likely to report lower effective tax rate in the future? Assume that Statutory tax rates do not change.(Beta)

Revenue Growth Issue and FX Risks

- Revenues of multinational companies may be denominated in different currencies but are translated into the reporting currency for the purpose of preparing financial statements. Revenue growth can occur due to **price or volume changes** and due to **changes in exchange rates**. Analysts separate the two because the growth in revenues due to price or volume changes are more sustainable.
- Foreign exchange risks include the impact of changes in currency values on assets and liabilities of a business, as well as on future sales. **Disclosures** may enable an analyst to evaluate the impact of changes in currency values on company's business.

Reading 19

Evaluating Quality of Financial Reporting

Framework

1. The quality of financial reports
2. Earnings
3. cash flow
4. balance sheet
5. Sources of information about risk

The quality of financial reports

- The quality of financial reports → Financial reporting quality; Earnings (results) quality

	Financial Reporting Quality Low	**Financial Reporting Quality High**
Earnings Quality **High** (Results)	LOW financial reporting quality impedes assessment of earnings quality and impedes valuation.	HIGH financial reporting quality enables assessment. HIGH earnings quality increases company value.
Earnings Quality **Low** (Results)		HIGH financial reporting quality enables assessment. LOW earnings quality decreases company value.

The quality of financial reports

- Two basic points
  - The financial reports are GAAP-compliant and decision-useful.
  - The results (earnings) are high quality (adequate level of return)
- These two points provide a basic conceptual framework to assess the quality of a company's financial reports and to locate the company's financial reports along the quality spectrum.

Quality Spectrum of Financial Reports	**Quality Spectrum**
GAAP, decision-useful, sustainable, and adequate returns	HIGH ↓
GAAP, decision-useful, not sustainable, Low "earnings quality"	
Within GAAP, but biased choices	
Within GAAP, but "earnings management" (Real EM, Accounting EM)	
Non-compliant Accounting	
Fictitious transactions	LOW

The quality of financial reports

- **GAAP** refers generically to the generally accepted accounting principles or the accepted accounting standards of the jurisdiction under which the company reports. (IFRS,US GAAP)
- **Decision-useful information** embodies the characteristics of relevance and faithful representation.
- **High-quality earnings** provide an adequate level of return on investment (i.e., a return equal to or in excess of the cost of capital) and are sustainable.
- **Earnings management** aims to understate earnings volatility, etc. Earnings volatility is decreased by understating earnings in periods when a company's operations are performing well and overstating in periods when the company's operations are struggling.

The quality of financial reports

- **Biased choices can be mad not only in the context of reported amounts but also in the context of how information is presented.**
  - Disclose information transparently and in a manner that facilitates analysis,
  - Or disclose information in a manner that aims to be obscure unfavorable information and/or to emphasize favorable information
  - **Aggressive** if they increase the company's reported performance and financial position in the current period
  - **Conservative** if they decrease the company's reported performance and financial position in the current period.

Potential problems

- **Measurement and Timing Issues**

Sheet element	Recognition	Net income	Equity	liability	Asset
Revenue	Aggressive, premature, and fictitious	↑	↑	N/A	↑
Expenses	Omission and delayed	↑	↑	↓	↑

  - Understatement of contingent liabilities results in understated expenses and overstated income or overstated OCI, and overstated equity.
  - Overstatement of financial assets and understatement of financial liabilities, reported at fair value, results in overstated unrealized gains or understated unrealized losses, and overstated equity.
  - Cash flow from operations may be increased by deferring payments on payables, accelerating payments from customers, deferring purchases of inventory, and deferring other expenditures related to operations, such as maintenance and research.

Potential problems

➢ **Classification Issues**

- **Choices** with respect to reported amounts and timing of recognition typically affect more than one financial element, financial statement, and financial period.
- **Classification** choices typically affect one financial statement. (B/S, comprehensive income, CF/S).

I/S	Possible actions/choices
• Overstated or accelerated revenue recognition • Understated expenses • Misclassification of revenue, gains, expenses, or losses	• Channel stuffing, bill and hold • Lessor use of finance (capital) leases • Fictitious (fraudulent) revenue • Capitalizing expenditures as assets • Lessee use of operating leases • Classifying non-operating income or gains as part of operations • Classifying ordinary expenses as non-recurring or non-operating • Reporting gains through net income and losses through other comprehensive income

Potential problems

B/S	Possible actions/choices
• Over- or understatement of assets • Over- or understatement of liabilities • Misclassification of assets and/or liabilities	• Choice of models and model inputs to measure fair value • Classification from current to non-current • Over- or understating reserves and allowances • Understating identifiable assets and overstating goodwill

CF/S	Possible actions/choices
• Overstatement of cash flow from operations	• Managing activities to affect cash flow from operations • Misclassifying cash flows to positively affect cash flow from operations

Potential problems

➢ **Mergers and Acquisitions Issues**

- The financial results of the combined companies are reported on a consolidated basis (acquisition method). Companies with faltering cash-generating ability may be motivated to acquire other companies to increase cash flow from operations.
- The acquisition will be reported in the investing cash flows if paid in cash, or not even appear on the cash flow statement if paid for with equity.
- The consolidated cash flow from operations will include the cash flow of the acquired company, effectively concealing the acquirer's own cash flow problems. Such an acquisition can provide a one-time boost to cash from operations that may or may not be sustainable.

Potential problems

- **Mergers and Acquisitions Issues**
  - Acquirer may be motivated to increase earnings to inflate their stock price, to make an acquisition on more favorable terms.
  - The target company may also be motivated to inflated their stock price to obtain a more favorable price for their company.
  - Misreporting can be an incentives to make an acquisition. Acquisition make the financial statements more complicated, specially when the targeted company have less similar operations and less public information.
  - Accounting choices made: allocation of purchase price paid to identifiable net assets, and the balance to goodwill. Acquiring companies often underestimate the value of identifiable net assets, overestimating goodwill on acquisition. Goodwill is not amortized, but written down as impairment losses (one-off, non-recurring event).

Potential problems

- **Financial Reporting that Diverges from Economic Reality**
  - Analysts should adjust the reported information to better reflect their view of economic reality.
    - ✓ When faced with a restructuring charge, an impairment charge:
      - ◆If charges occur regularly, the analyst should attempt to "normalize" earnings by essentially spreading the current charges over past periods as well as the current period.
      - ◆If charges are one-off items, the analyst is justified in "normalizing" earnings by excluding the item from earnings.

Potential problems

- **Financial Reporting that Diverges from Economic Reality (con't)**
  - Items that are commonly encountered by analysts include the following:
    - ✓ Revisions to ongoing estimates, such as the remaining economic lives of assets, may lead an analyst to question whether an earlier change in estimate would have been more appropriate.
    - ✓ Sudden increases to allowances and reserves could call into question whether the prior estimates resulted in overstatement of prior periods' earnings instead of an unbiased picture of economic reality.
    - ✓ Large accruals for losses (e.g., environmental or litigation-related liabilities) suggest that prior periods' earnings may have been overstated because of the failure to accrue losses earlier.
  - Other examples: Operating lease; Research and Development; OCI VS NI

Evaluating the quality of financial reports

- **General Steps to Evaluate the Quality of Financial Reports**
  - Develop an understanding of the company and its industry.
  - Learn about management.
  - Identify significant accounting areas.
  - Make comparisons:
    - ✓ Compare the company's financial statements and significant disclosures in the current year's report with the financial statements and significant disclosures in the prior year's report.
    - ✓ Compare the company's accounting policies with those of its closest competitors.
    - ✓ Using ratio analysis
  - Check for warnings signs of possible issues with the quality of the financial reports.
  - Growth potential of a company's each segment.
  - Use appropriate quantitative tools to assess the likelihood of misreporting.

Evaluating the quality of financial reports

- **Beneish Model**
  - M-score = Score indicating probability of earnings manipulation
    - = –4.84 +0.92 DSR + 0.528GMI + 0.404AQI + 0.892SGI + 0.115DEPI – 0.172SGAI + 4.67Accruals – 0.327LEVI
  - **DSRI** (days sales receivable index) = $(Receivables_t/Sales_t)/(Receivablest\_1/Sales_{t-1})$.
  - **GMI** (gross margin index) = $Gross\ margin_{t-1}/Gross\ margin_t$.
  - **AQI** (asset quality index) = $[1 – (PPE_t + CA_t)/TA_t]/[1 – (PPE_{t-1} + CA_{t-1})/TA_{t-1}]$,
  - **SGI** (sales growth index) = $Sales_t/Sales_{t-1}$.
  - **DEPI** (depreciation index) = $Depreciation\ rate_{t-1}/Depreciation\ rate_t$, where Depreciation rate = Depreciation/(Depreciation + PPE).
  - **SGAI** (sales, general, and administrative expenses index) = $(SGA_t/Sales_t)/(SGA_{t-1}/Sales_{t-1})$.
  - **Accruals** = (Income before extraordinary items – Cash from operations)/Total assets.
  - **LEVI** (leverage index) = $Leverage_t/Leverage_{t-1}$. Leverage ratio = D/A.

Evaluating the quality of financial reports

- **Beneish Model**
  - **DSR**: changes in the relationship between receivables and sales could indicate inappropriate revenue recognition.
  - **GMI**: deterioration in margins could predispose companies to manipulate earnings.
  - **AQI**: change in the percentage of assets other than in PPE and CA could indicate excessive expenditure capitalization.
  - **SGI**: managing the perception of continuing growth and capital needs from actual growth could predispose companies to manipulate sales and earnings.
  - **DEPI**: Declining depreciation rates could indicate understated depreciation as a means of manipulating earnings.
  - **SGAI**: an increase in fixed SGA expenses suggests decreasing administrative and marketing efficiency, which could predispose companies to manipulate earnings.
  - **Accruals**: higher accruals can indicate earnings manipulation.
  - **LEVI**: increasing leverage could predispose companies to manipulate earnings.

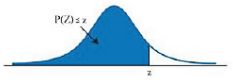
Evaluating the quality of financial reports

- **Beneish Model**
  - The M-score in the Beneish model is a normally distributed random variable with a mean of 0 and a standard deviation of 1.0. **M-scores of –1.49 and –1.78 indicate that the probability of earnings manipulation is 6.8% and 3.8%, respectively. Higher M-scores (i.e., less negative numbers) indicate an increased probability of earnings manipulation.** The probability is given by the amount in the left side of the distribution.
  - The cutoff value for classification minimizes the cost of misclassification. The likely relevant cutoff for investors is a probability of earnings manipulation of 2.9% (an M-score exceeding –1.78).
- **Example:**

  ABC Corporation M-score = -1.231, probability of manipulation = 10.91%
  - XYZ is likely a manipulator. The M-score is higher than the cutoff of –1.78, indicating a higher-than-acceptable probability of manipulation.

Z-table

Cumulative Z-Table



Standard Normal Distribution
$P(Z \leq z) = N(z)$ for $z \geq 0$

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319

Evaluating the quality of financial reports

- **Limitation of Beneish Model**
  - The Beneish model relies on accounting data, which may not reflect economic reality. Deeper analysis of underlying relationships may be warranted to get a clearer picture.
  - Managers may begin to game the measures used if they become aware of the use of specific quantitative tools.

Bankruptcy prediction models – Altman model

- Altman developed a model to discriminate between two groups: bankrupt and non-bankrupt companies. Altman's Z-score is calculated as follows:

  Z = 1.2 A + 1.4 B + 3.3 C + 0.6 D + 1.0 E

  Where:

  A = WC / TA

  B = RE / TA

  C = EBIT / TA

  D = MV of Equity / BV of Debt

  E = Revenue / TA

- Scores of less than 1.81 indicated a high probability of bankruptcy, scores greater than 3.00 indicated a low probability of bankruptcy, and scores between 1.81 and 3.00 were not clear indicators.
- Limitation: (1) single-period static model, and does not capture the change in key variables over time. (2) mostly uses accounting data not market based data.

The quality of earnings

- **High-quality earnings are:**
  - Sustainable: Expected to recur in future.
  - Adequate: Cover company's cost of capital.
    - ✓ Sustainability of earnings excluding items that are obviously non-recurring and persistence of growth in those earnings.
      - ◆Assumption: more persistent earnings are more useful inputs for equity valuation models involving earnings forecasts.
- **Persistence can be expressed as the coefficient on current earnings in a simple model:**
  - $Earnings_{t+1} = \alpha + \beta_1 Earnings_t + \varepsilon$
  - $Earnings_{t+1} = \alpha + \beta_1 Cash\ flow_t + \beta_2 Accruals_t + \varepsilon$
    - ✓ Persistent earnings are driven by the cash flow element of earnings
    - ✓ A higher coefficient (β1) represents more persistent earnings.

Mean reversion in earnings

- **Mean reversion in earnings**
  - Mean reversion in earnings:
    - ✓ Phenomenon that tendency of earnings at extreme levels to revert back to normal level.
  - Due to this empirically observation, extreme earnings should not be expected to continue indefinitely because:
    - ✓ Abandoned poorly performing businesses and segments—increase return
    - ✓ Abnormal high profit attract competition and capital migrates toward more profitable businesses and segments—decrease return

Evaluate the earnings quality

- **Revenue recognition**

Issues	Range of problems	Warning sign
Revenue misstatement	Bring forward or delay the revenue recognition	Large changes in account associated with A/R, unearned revenue, etc. (large increases in A/R, large decreases in unearned revenue)
Accelerating revenue	Accelerate the recognition of revenue by reporting revenue in current period that should be reported in future when it's hard to assess the progress of earning. To analyze the ratio of revenue to cash collected from customers is a good way to detect acceleration of revenue recognition.	Significant revenue without cash collection; Seeking for additional financing; Significant options vested by management. Maintain its track record of successively meeting analyst forecasts
Nonrecurring or non-operating as revenue	Report the non-recurring items or non-operating gain as revenue.	Temporal inconsistency with respect to the included revenues and expenses in a company's definition of operating income

Evaluate the earnings quality

- **Expense recognition**

Issues	Range of problems	Warning sign
Understating expenses(see example 4)	▪ Aggressive depreciation or amortization method and assumptions; ▪ Un-recorded allowance for obsolete inventories	▪ Ratios of depreciation; ▪ Inventory turnover ratios;
Deferring expenses	Improper capitalization of cost which should be expensed.	▪ Track growth in net non-current assets
Ordinary as nonrecurring or non-operating (see example 5 and 6)	Report the ordinary expenses or cost as non-recurring items or non-operating losses.	Check ratio: (sales – COGS – SG&A) / sales

Indicators of cash flow quality

- Discussions of cash flow quality typically focus on operating cash flow (OCF).
- Evaluate the context of the corporate life cycle
  - Start-up company: have negative operating and investing cash flows, financed by financing cash flows.
  - Established company: have positive operating cash flow from investing cash flow.
    - ✓ The characteristics of high-quality cash flow:
      - ◆Positive OCF
      - ◆OCF derived from sustainable sources
      - ◆OCF adequate to cover capital expenditures, dividends, and debt repayments
      - ◆OCF with relatively low volatility

Indicators of cash flow quality

- **OCF** is generally viewed as being less easily manipulated than operating or net income. Large differences between earnings and OCF or increases in such differences can be an indication of earnings manipulation.
- **Even though,** the importance of OCF may create incentives for mangers to manipulate the amounts reported
  - **Timing issues**
    - ✓ Selling receivables to a third party
    - ✓ Delaying paying account payables

    } **boost OCF.**
  - **Classification issues**
    - ✓ Shifting positive cash flow items from investing or financing activities to operating activities to inflate OCF.

Evaluate the cash flow quality

- **The steps of evaluating the statement of cash flow:**
  - Checking for any unusual items or items that have not shown up in prior years.
  - Checking revenue quality.
    - ✓ Aggressive revenue recognition → A/R ↑→OCF↓)
  - Checking for strategic provisioning.
    - ✓ Provisions for restructuring charges show up as an inflow in the year of the provision and then as an outflow when ordinary operating expenses are channeled through such reserves.

The quality of balance sheet

- For the **balance sheet**, high financial reporting quality is indicated by **completeness**, **unbiased measurement**, and **clear presentation**.
- **Completeness**
  - Off-balance-sheet obligations
    - ✓ A balance sheet with significant amounts of off-balance-sheet debt would lack the completeness aspect of financial reporting quality.
      - ◆Take-or-pay contracts: obligate a party to either take delivery of goods or pay a specified amount.
      - ◆Operating lease
  - Intercorporate investments, profitability ratios under equity method would be higher than under acquisition method.

The quality of balance sheet

- **Unbiased measurement**
  - Unbiased measurement is a particularly important aspect of financial reporting quality for assets and liabilities for which valuation is subjective.
    - ✓ Value of the pension liability.
    - ✓ Value of investment in debt or equity of other companies for which a market value is not readily available.
    - ✓ Goodwill value.
    - ✓ Inventory valuation.
    - ✓ Impairment of PP&E and other assets.
  - Overstatement the asset value would overstate profitability and equity.

The quality of balance sheet

- **Clear presentation**
  - A company's financial statements can provide useful indicators of financial or operating risk.
    - ✓ While accounting standards specify which items should be included in the balance sheet, they do not typically specify how such items must be presented. (in determining which line items should be shown separately and which should be aggregated into a single total)
    - ✓ Clarity of presentation allows an analyst to gather relevant information as well as to make comparisons across companies.
    - ✓ Clarity should be consisted with information found in notes of financial statements and supplementary disclosures.

Sources of information about risk

- **Several sources of information about the financial, operating, and other risks**
  - **Financial statements**
    - ✓ High leverage ratios (or, similarly, low coverage ratios) derived from financial statement data can signal financial risk.
    - ✓ Highly variable operating cash flows or negative trends in profit margins can signal operating risks.
  - **Auditor's report**
    - ✓ An audit opinion(s) can provide some information about reporting risk.
      - ◆**Notice**: an audit opinion relates to historical information and would not provide information on a timely enough basis to be a useful source of information about risk.
  - **Notes to financial statements**
    - ✓ The notes typically contain information that is useful in understanding a company's risk. For example, both IFRS and US GAAP require specific disclosures about risks related to contingent obligations, pension and post-employment benefits, and financial instrument risks.

Sources of information about risk

- **Management Commentary (MD&A)**
  - MD&A can give users helpful in assessing the company's risk exposures and approaches to managing risk.
- **SEC from "NT"**
  - In the United States, SEC from "NT" is filed when a firm is unable to file required reports in a timely manner. Delays in filing are often the result of accounting difficulties. (i.e., internal disagreement on an accounting principle or estimate, the lack of adequate financial staff, or the discovery of an accounting fraud). In general, an NT filing is highly likely to signal problems with financial reporting quality.
- **Financial press**
  - The financial press can be a useful source of information about risk when, for example, a financial reporter uncovers financial reporting issues that had not previously been recognized. An analyst should undertake additional investigation of any issue identified.

Reading 20

Integration of FSA Techniques

The Framework

Phase	Sources of Info	Output
1. Define the purpose and context	▪ Nature of the function; ▪ Communication; ▪ Institutional guideline	▪ Statement of purpose; ▪ Questionnaire; ▪ Report's content; ▪ timetable
2. Collect input	▪ FS, other data; ▪ Discussion with all parties; ▪ Site visits	▪ FS; ▪ Financial data tables; ▪ Completed questionnaire;
3. Process data	▪ From step 2	▪ Adjusted FS; ▪ Common-sized FS; ▪ Ratios & graphs; ▪ Forecasts;
4. Analyze or interpret the data	▪ From step 2 and 3	▪ results

The Framework

Phase	Sources of Info	Output
5. Develop and communicate conclusions and recommendations	▪ Analytical results and previous report; ▪ Institutional guidelines	▪ Statement of purpose; ▪ Questionnaire; ▪ Report's content; ▪ timetable
6. Follow up	▪ Periodically updated information	▪ Updated reports;

Case 1: the LT Equity Investment

- **Purpose:**
  - Find out the drivers of financial success;
  - Assessing the sustainability;
  - Risks to maintaining the sustainability;
- **Collect input data**
- **Process & Analyze/Interpret data**
  - Dupont analysis;
  - Analysis of composition of asset base;
  - Capital structure analysis;
  - Segments and allocation of capital analysis;
  - Examination of accruals;
  - C/F study;
  - Decomposition and analysis of the company's valuation

Case 1: the LT Equity Investment

- **Dupont analysis**
  - Extended analysis
    - ✓ ROE = (net income/EBT) X (EBT/EBIT) X (EBIT/revenue) X (revenue/total assets) X (total assets/total equity)
      = [(tax burden) X (interest burden) X (EBIT margin) X (asset turnover) X (financial leverage)
  - What's the key to increasing of ROE in 3 years in this case?

Case 1: the LT Equity Investment

- **Capital structure analysis**
  - The target is de-leverage;
  - Make it less financial risky;
- **Segment analysis/Capital allocation**
- **Accruals of earnings quality**
  - Refer to SS 26.
- **CF relations**
- **Decomposition and analysis of Valuation**

Case 2: Off-BS leverage from operating lease

- **Purpose:**
  - Looking for any off-BS leverage impact
- **Collect input data**
  - PV factor
- **Process & Analyze/Interpret data**
  - Lease expenses analysis;
  - Payment analysis;
  - PV of lease payment is capitalized to recalculate the ratios.

Case 3: changes in accounting

- **Purpose:**
  - Evaluate the impact of changes in consolidation
- **Collect input data**
  - 10-K;
  - MD&A
- **Process & Analyze/Interpret data**
  - Add back assets and liabilities;
  - Then make analysis.

Financial reporting quality

- **The larger proportion of accrual component in the earning, the faster the reversion will occur.**
  - Larger proportion——accounting distortions are greater, accrual component of earnings has lower persistence

Financial reporting quality

- **Measure earning quality - overview**
- **Earning quality refers to earning properties :**
  - Persistence and sustainability.
- **Earnings are decomposed into the accrual component and cash component:**
  - Aggregated accruals = accrual-based earnings – cash earnings
- **Two approaches to decomposition:**
  - B/S approach;
  - CF approach.
    - ✓ CF approach is preferred because it generates a cleaner measure which is free from the effects of non-cash acquisitions and foreign currency translation adjustment effects.

Financial reporting quality

- **Measure earning quality**
- **Decomposition with B/S approach**
  - Net operating assets (NOA) is the difference between operating assets and operating liabilities:
  - NOA = (total assets – cash) – (total liabilities – total debt)
    - ✓ Exclude cash and debt as they are essentially discretion free.
  - Aggregated accruals (AA), under B/S approach, refers to the changes in NOA during a fiscal period:
  - $AA_{B/S} = NOA_t - NOA_{t-1}$
  - Accrual ratio, $(AR)_{B/S} = AA_{B/S} / [(NOA_t + NOA_{t-1})/2]$
  - In order to analyze the sub-components of accrual activity, relevant line of accrued items could be further analyzed with deflated by average NOA.
- **Decomposition with CF approach**
  - $AA_{C/F} = NI_t - (CFO_t + CFI_t)$
  - $AR_{C/F} = AA_{C/F} / [(NOA_t + NOA_{t-1})/2]$
    - ✓ CFO: current operating piece of cash
    - ✓ CFI: non-current operating piece of cash

It's not the end but just beginning.

By training your thoughts to concentrate on the bright side of things, you are more likely to have the incentive to follow through on your goals. You are less likely to be held back by negative ideas that might limit your performance.

试着训练自己的思想朝好的一面看，这样你就会汲取实现目标的动力，而不会因为消极沉沦停滞不前。

Corporate Finance

2017CFA二级培训项目

讲师：洪波

101% contribution Breeds Professionalism

Topic Weightings in CFA Level II

Session NO.	Content	Weightings
Study Session 1-2	Ethics & Professional Standards	10-15
Study Session 3	Quantitative Methods	5-10
Study Session 4	Economic Analysis	5-10
Study Session 5-6	Financial Statement Analysis	15-20
Study Session 7-8	**Corporate Finance**	**5-15**
Study Session 9-11	Equity Analysis	15-25
Study Session 12-13	Fixed Income Analysis	10-20
Study Session 14	Derivative Investments	5-15
Study Session 15	Alternative Investments	5-10
Study Session 16-17	Portfolio Management	5-10

Framework

Corporate Finance

- **SS7: Corporate Finance**
  - R21: Capital Budgeting
  - R22: Capital Structure
  - R23: Dividends and Share Repurchases: Analysis
- **SS8: Corporate Finance: Financing and Control Issues**
  - R24: Corporate Performance, Governance, and Business Ethics
  - R25: Corporate Governance
  - R26: Mergers and Acquisitions

Review of Level I basics & Links with Level II

Corporate Finance

How to create wealth?	**Investment decision**	Invest in project – Capital budgeting Invest in company – M&A
How to fund the investment?	**Financing decision**	Debt or equity finance – Capital structure
How to distribute the wealth?	**Dividend decision**	Distribute or retain – Dividend and share repurchase

Reading 21

Capital Budgeting

Framework

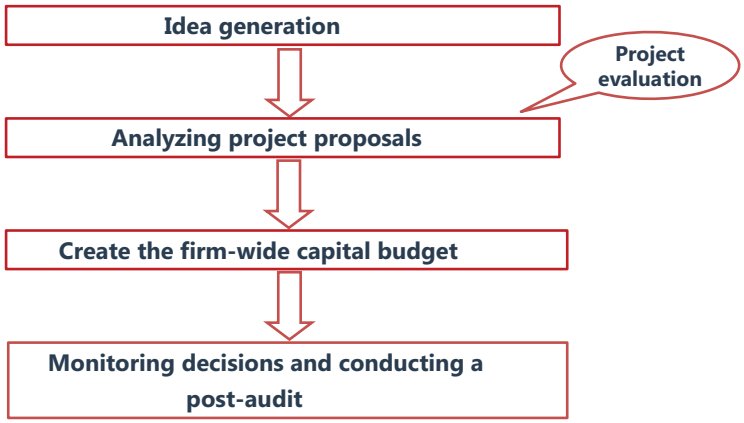
1. Capital budgeting project evaluation
2. Inflation effects on capital budgeting
3. Mutually exclusive projects with different lives
4. Project risk analysis
5. Using the CAPM in capital budgeting
6. Evaluating projects with real options
7. Common capital budgeting pitfalls
8. Alternative measures of income and valuation models
9. Other valuation models

Cash flow projection

- **Capital projects can be classified as**
  - Replacement projects to maintain the business
  - Replacement projects for cost reduction
  - Expansion projects
  - New product or market
  - Mandatory investment
  - Other projects
- **Principles of capital budgeting**
  - Decision are based on CF (incremental), not accounting income
    - ✓ Sunk costs (not included) & Externalities (included)
  - Cash flow are based on opportunity costs
  - The timing of cash flows is important
  - Cash flow are analyzed on an after tax basis
  - Financing costs are reflected in the project's required rate of return

The capital budgeting process

- **Capital budgeting is the process of selecting and determining the most profitable long-term projects**



The categories of capital budgeting projects

- **Capital budgeting projects can be classified as**
  - Replacement projects
    - ✓ Replacement decision to maintain the business
    - ✓ Replacement decision for cost reduction purpose
  - Expansion projects
    - ✓ Expansion projects for existing product
    - ✓ Expansion projects for new product
  - Mandatory investment: regulatory, safety, and environmental project
  - Other projects: projects are not easily analyzed through the capital budgeting process

MACRS

- The half-year convention under MACRS assumes that the asset is placed in service in the middle of the first year.
- The depreciable basis = purchase price + shipping or handling and installation costs. The basis is not adjusted for salvage value regardless of whether the accelerated or straight-line method is used.

Depreciation methods affect capital budgeting decisions because they affect after-tax cash flow.

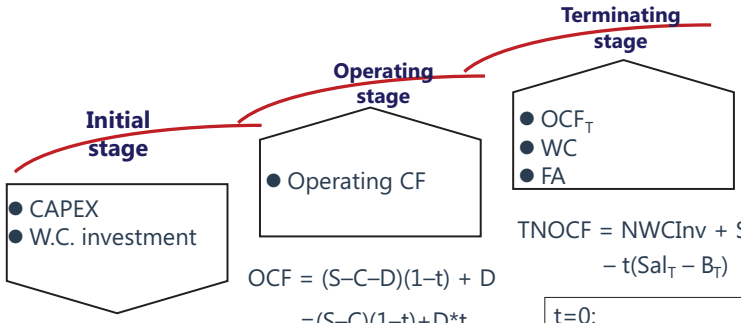
In general, accelerated depreciation methods (MACRS) lead to higher after-tax cash flows and a higher project NPV.

MACRS

Ownership Year	Class of Investment			
	3-Year	5-Year	7-Year	10-Year
1	33%	20%	14%	10%
2	45	32	25	18
3	15	19	17	14
4	7	12	13	12
5		11	9	9
6		6	9	7
7			9	7
8			4	7
9				7
10				6
11				3
	100%	100%	100%	100%

- Buildings are 39-year assets: 1.3% in years 1 and 40 and 100/39 =2.6% in the other years.

Cash flow projection – Expansion project



Initial outlay = – FCInv – NWCInv

OCF = (S–C–D)(1–t) + D
=(S–C)(1–t)+D*t

TNOCF = $NWCInv + Sal_T - t(Sal_T - B_T)$

t=0:
- Initial outlay

t=t:
- OCF_t

t=T:
- OCF_T
- Return of WC
- Sale of old assets

Capital Budgeting Cash Flows Example

						$'000
Year	**0**	**1**	**2**	**3**	**4**	**5**
Investment outlays:						
Fixed capital	–200					
Net working capital	–30					
Total	–230					
Annual after-tax operating cash flows:						
Sales		220	220	220	220	220
Cash operating expenses		90	90	90	90	90
Depreciation		35	35	35	35	35
Operating income before taxes		95	95	95	95	95
Taxes on operating income		38	38	38	38	38
Operating income after taxes		57	57	57	57	57
Add back: Depreciation		35	35	35	35	35
After-tax operating cash flow		92	92	92	92	92
Terminal year after-tax non-operating cash flows:						
After-tax salvage value						40
Return of net working capital						30
Total						70
Total after-tax cash flow	–230	92	92	92	92	162
Net present value at 10 percent required rate of return	162.217					
Internal rate of return	32.70%					

Capital Budgeting Cash Flows Example

- Outlay=FCInv+NWCInv
- Outlay = 200,000 + 30,000 – 0 + 0 = $230,000
- CF = (S – C – D)(1 – T) + D
  - = (220,000 – 90,000 – 35,000)(1 – 0.40) + 35,000
  - = 95,000 × (0.60) + 35,000
  - = 57,000 + 35,000 = $92,000
- CF = (S – C)(1 – T) + TD
  - = (220,000 – 90,000)(1 – 0.40) + 0.40(35,000)
  - = 130,000(0.60) + 0.40(35,000) = 78,000 + 14,000 = $92,000
- $TNOCF = Sal_T + NWCInv - T(Sal_T - B_T)$
  - = 50,000 + 30,000 – 0.40(50,000 – 25,000)
  - = 50,000 + 30,000 – 10,000 = $70,000

Capital Budgeting Cash Flows Example

- The old fixed capital (including land) is sold for $50,000, but $10,000 of taxes must be paid on the gain. Including the $30,000 return of net working capital gives a terminal year non-operating cash flow of $70,000.
- The NPV of the project is the present value of the cash flows—an outlay of $230,000 at time zero, an annuity of $92,000 for five years, plus a single payment of $70,000 in five years:

$$NPV = -230,000 + \sum_{t=1}^{5} \frac{92,000}{(1.1)^t} + \frac{70,000}{(1.1)^5} = -230,000 + 348,752 + 43,465 = \$162,217$$

Replacement capital project

- **For a Replacement project, the cash flow are the same as expansion project except:**
  - Current after-tax salvage value of the old assets reduces the initial outlay.

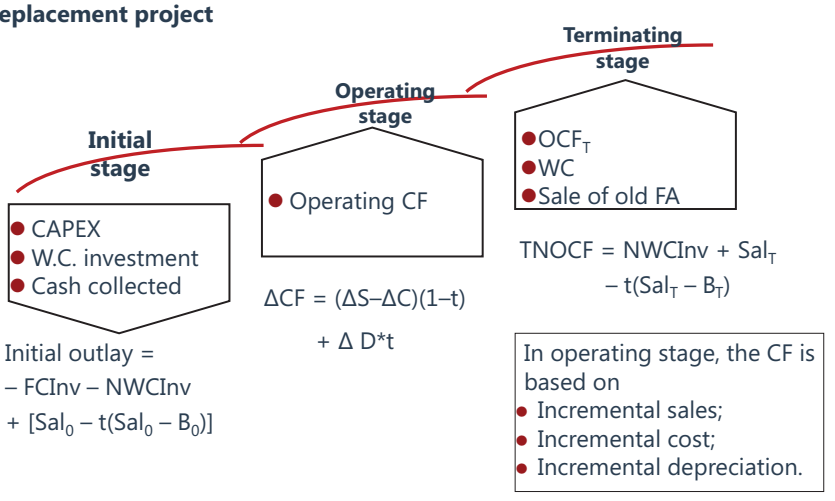
    Initial outlay= – FCInv – NWCInv + [Sal_0 – (Sal_0 – B_0) * t]
  - The cash flows relevant to an investing decision are the **incremental cash flows (ΔCF)**: the cash flows the company realizes *with* the investment compared to the cash flows the company would realize without the investment.

$$\Delta CF = (\Delta S - \Delta C)(1-t) + \Delta D \times t$$

- **Assumption:**
  - Same useful life of old and new assets.

Cash flow projection – Replacement project

- **Replacement project**



Capital Budgeting CFs-Replacement project

Old Equipment		New Equipment	
Current book value	$400,000		
Current market value	$600,000	Acquisition cost	$1,000,000
Remaining life	10 years	Life	10 years
Annual sales	$300,000	Annual sales	$450,000
Cash operating expenses	$120,000	Cash operating expenses	$150,000
Annual depreciation	$40,000	Annual depreciation	$100,000
Accounting salvage value	$0	Accounting salvage value	$0
Expected salvage value	$100,000	Expected salvage value	$200,000

Capital Budgeting CFs-Replacement project

- Outlay = FCInv + NWCInv – Sal_0 + T(Sal_0 – B_0)

  Outlay = 1,000,000 + 80,000 – 600,000 + 0.3(600,000 – 400,000) = $540,000
- The incremental operating cash flows are: CF = (S – C – D)(1 – T) + D

  = [(450,000 – 300,000) – (150,000 – 120,000) – (100,000 – 40,000)](1 – 0.30) + (100,000 – 40,000)

  = (150,000 – 30,000 – 60,000)(1 – 0.30) + 60,000 = $102,000
- The terminal year incremental after-tax non-operating cash flow is: TNOCF = Sal_T + NWCInv – T(Sal_T – B_T)

  = (200,000 – 100,000) + 80,000 – 0.30[(200,000 – 100,000) – (0 – 0)]

  = $150,000
- Once the cash flows are identified, the NPV and IRR are readily found. The NPV, found by discounting the cash flows at the 8 percent required rate of return, is

$$NPV = -540,000 + \sum_{t=1}^{10} \frac{102,000}{1.08^t} + \frac{150,000}{1.08^{10}} = \$213,907$$

Cash flow projection

- **Special topics:**
  - Replacement project
    - ✓ Current after-tax salvage value of the old assets reduces the initial outlay;
    - ✓ Depreciation is the change in depreciation if the project is accepted compared to the depreciation on the old machine.
  - Depreciation schedules
    - ✓ It affects capital budgeting decisions because they affect after-tax cash flow.
    - ✓ In general, accelerated depreciation methods lead to higher after-tax cash flows and a higher project NPV.
    - ✓ Interest is not included in operating cash flows for capital budgeting purposes because it is incorporated into the project's cost of capital.
    - ✓ US IRC adopts MACRS system for tax deduction with depreciation.

Inflation effects on capital budgeting

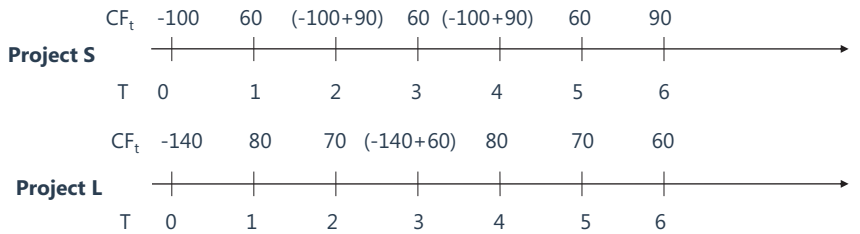
- **Inflation is a factor that must be considered as part of the capital budgeting process:**
  - Nominal cash flows must be discounted at the nominal interest rate, and real cash flows must be discounted at the real interest rate.
  - If inflation is higher than expected,
    - ✓ the profitability of the investment is lower than expected.
    - ✓ reduces the real tax savings from depreciation.→ NPV underestimated
    - ✓ increases the corporation's real taxes because it reduces the value of the depreciation tax shelter
    - ✓ decreases the value of fixed payments to bondholders.
  - Inflation affects costs and revenues differently.

Mutually exclusive projects with different lives

- **The issue:**
  - Can NOT assess directly by comparing with the NPV of 2 projects with different lives;
  - Assume that the 2 projects are repeated over the time horizon
- **Two methods to compare projects with unequal lives that are excepted to be repeated indefinitely:**
  - Least common multiple of lives approach
    - ✓ Extends the lives of the projects so that the lives divide equally into the chosen time horizon.
  - Equivalent annual annuity (EAA) approach
    - ✓ EAA is the annuity payment each project year that has a present value (discounted at the WACC) equal to the NPV of the project.
    - ✓ choose the investment chain that has the highest EAA.
- **The two approaches are logically equivalent and will result in the same decision.**

Example: Least common multiple of lives

- For Projects S and L, the least common multiple of 2 and 3 is 6: The two-year project would be replicated three times over the six-year horizon and the three-year project would be replicated two times over the six-year horizon. The cash flows for replicating Projects S and L over a six-year horizon are shown below.



- Discounting the cash flows for the six-year horizon results in an NPV for Project S of $ 72.59 and an NPV for Project L of $62.45.
- Apparently, investing in Project S and replicating the investment over time has a greater NPV than choosing Project L and replicating it.

Example: EAA

- For project S above, we already calculate the NPV of the project over its two-year life to be $28.93. For a two-year life and a 10% discount rate, a payment of $16.66 is the equivalent annuity.

  The EAA for project L is found by annuitizing its $35.66 NPV over three years, so the EAA for project L is $14.34.

  The decision rule for the EAA approach is to choose the investment chain that has the highest EAA, which in this case is Project S.

- **The two approaches result in the same decision.**

Capital rationing

Capital rationing

- **Capital rationing is the allocation of a fixed amount of capital among the set of available projects that will maximize shareholder wealth.**
  - Hard capital rationing
    - ✓ occurs when the funds allocated to managers under the capital budget cannot be increased
  - Soft capital rationing
    - ✓ occurs when managers are allowed to increase their allocated capital budget if they can justify that the additional funds will create shareholder value.
- **A firm with less capital than profitable (positive NPV) projects should choose the combination of projects they can afford to fund that has the greatest total NPV.**

Example: Capital rationing

- Mayco has a $2,000 capital budget, and has the opportunity to investment in five different projects. The initial investment and NPV of the projects are described in the following figure. Determine which projects Mayco should invest.

  Projects available to Mayco:

	Investment outlay	NPV
Project A	-$1,200	$500
Project B	-$1,000	$480
Project C	-$800	$300
Project D	-$450	$150
Project E	-$200	$40

Example: Capital rationing

Combination	Combined NPV
Project A + C	$500 + $300 = $800
Project A + D + E	$500 + $150 + $40 = $690
Project B + C + E	$480 + $300 + $40 = $820
Project B + D + E	$480 + $150 + $40 = $670
Project C + D + E	$300 + $150 + $40 = $490

- **Answer:**
  - All of the projects are profitable, but with a capital budget of only $2,000, Mayco should choose Project B, C, and E that have a combined NPV of $820.
  - Note that choose Project B, C, and E, means that Project A, which has the highest NPV, is not chosen. If Project A were chosen, the next best choice would be Project C, which would max out the capital budget with a combined NPV of only $800.

Risk Analysis—Stand-Alone Methods

- **Risk analysis techniques include:**
  - **Sensitivity analysis** involves varying an independent variable to see how much the dependent variable changes, all other things held constant. The key to sensitivity analysis is to only change one variable at a time.
  - **Scenario analysis** considers the sensitivity of the dependent variable to simultaneous changes in all of the independent variables. *Worst case, best case, and base case*.
  - **Simulation analysis (or Monte Carlo simulation)** uses repeated random draws from the assumed probability distributions of each input variable to generate a simulated distribution of NPV.

Example: Base case

Base case	
Unit price	$5.00
Annual unit sales	40
Variable cost per unit	$1.50
Investment in fixed capital	$300
Investment in working capital	$50
Project life	6years
Depreciation (straight line)	$50 p.a.
Expected salvage value	$60
Tax rate	40%
Required rate of return	12%
NPV	$121,157

Independent variables or Inputs

Dependent variable or Outputs

Example: Sensitivity analysis

Sensitivity analysis			
	Base value	**Low value**	**High value**
Unit price	**$5.00**	$4.50	$5.50
Annual unit sales	**40**	35	45
Variable cost per unit	**$1.50**	$1.40	$1.60
Expected salvage value	**$60**	$30	$80
Tax rate	**40%**	38%	42%
Required rate of return	**12%**	10%	14%

Example: Sensitivity analysis

Projected NPV				
Variable	Base case	With Low estimate	With High estimate	**Range of estimate**
Unit price	121,157	71,820	170,494	**98,674**
Annual unit sales	121,157	77,987	164,326	**86,339**
Cost per unit	121,157	131,024	111,289	**19,735**
Salvage value	121,157	112,037	127,236	**15,199**
Tax rate	121,157	129,165	113,148	**16,017**
Required return	121,157	151,492	93,602	**57,890**

Most sensitive

Treat independent for low and high estimate

Example: Scenario analysis

Scenario analysis			
Variable	**Pessimistic**	**Most likely**	**Optimistic**
Unit price	$4.50	$5.00	$5.50
Annual unit sales	35	40	45
Variable cost per unit	$1.60	$1.50	$1.40
Investment in fixed capital	$320	$300	$280
Investment in working capital	$50	$50	$50
Project life	6years	6years	6years
Depreciation	$53,333	$50	$46,667
Salvage value	$40	$60	$80
Tax rate	40%	40%	40%
Required rate of return	13%	12%	11%
NPV	**-$5,725**	$121,157	$269,685
IRR	12.49%	22.60%	34.24%

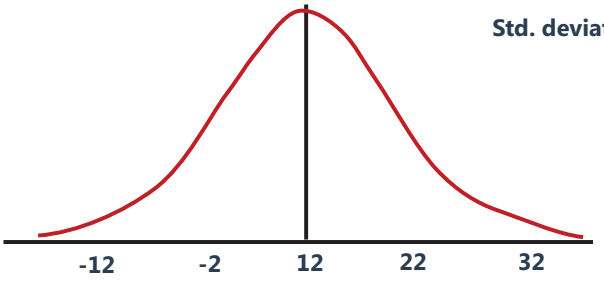
Treat together

Simulation analysis/ Monte Carlo analysis

- **Steps in simulation analysis:**
  1. Assume a specific probability distribution for each input variable. For example, we might assume that unit sales are normally distributed with a mean of 100 and a standard deviation of 15, unit prices are normally distributed with a mean of $40 and a standard deviation of $5, and so on for each input variable. We don't have to assume a normal distribution for each variable.
  2. Simulate a random draw from the assumed distribution of each input variable. That results in a single value for each input. For example, our first draw might be unit sales of 85, a unit price of $42.00, and so on.
  3. Given each of the inputs from Step 2, calculate the project NPV.
  4. Repeat Step 2 and Step 3 10 times.
  5. Calculate the mean NPV, the standard deviation of the NPV, and the correlation of NPV with each input variable.
  6. Graph the resulting 10 NPV outcomes as a probability distribution.

Simulation analysis/ Monte Carlo analysis

- Simulation analysis (or Monte Carlo simulation) results in a probability distribution of project NPV outcomes, rather than just a limited number of outcomes as with sensitivity or scenario analysis (e.g., base case, best case, worst case).
- The probability distribution is not symmetrical or necessarily perfectly normal. Although with a large number of observations, the distribution is likely to be approximately normal.



Risk Analysis—Market Risk Methods

- The discount rate in capital budgeting is the risk-adjusted rate rather than WACC.
  - The discount rate should reflect the risk of project to be evaluated;
  - WACC reflects the risk of whole company.
- The CAPM can be used to determine the appropriate discount rate for a project based on risk.
  - The project beta is used as a measure of the systematic risk of the project and the security market line (SML) estimates the required return:
- When the risk of a project is different from the overall company, using WACC will:

$$R_{project} = R_f + \beta_{project}[E(R_M) - R_f]$$

  - overestimate the NPV, if project's risk > company's risk
  - underestimate the NPV, if Project's risk < company's risk

Evaluating projects with real options

- A critical assumption of traditional capital budgeting tools is that the investment decision is made now, with no flexibility considered in future decisions.
- Real options allow managers to make decisions in the future that alter the value of capital budgeting investment decision today.
  - Similar to financial call and put options.
  - Real options are based on real assets rather than financial assets and are contingent on future events.
  - Real options offer managers flexibility that can improve the NPV estimates for individual projects.
- **Types of real options include:**
  - Timing options
  - Sizing options
  - Flexibility options
  - Fundamental options

Evaluating projects with real options

- **Timing options: allow the company to delay investing.**
- **Sizing options**
  - Abandonment option: Similar to put options. Allow management to abandon a project if the CF from abandoning exceeds the PV of the CF from continuing the project.
  - Expansion option: Similar to call options. Allow a company to make additional investments in a project if doing so creates value.
- **Flexibility options: give managers choices regarding the operational aspects of a project.**
  - Price-setting options: By increasing prices, benefit from the excess demand, which it cannot do by increasing production.
  - Production flexibility options: The company can profit from working overtime or from adding additional shifts.
- **Fundamental options**
  - The payoffs from the investment are contingent on an underlying asset, just like most financial options.
    - ✓ High oil prices, drill a well.

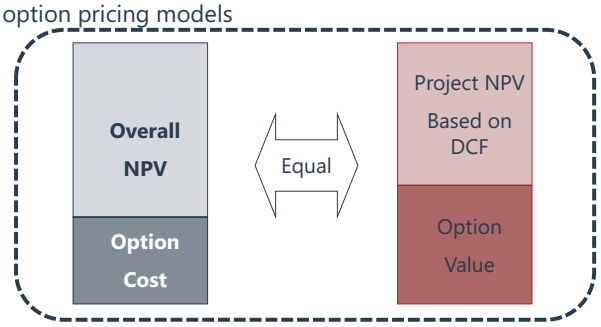
Evaluating projects with real options

- A critical assumption of many applications of traditional capital budgeting tools is that the investment decision is made now, with no flexibility considered in future decisions.
- More reasonable approach is to assume that the corporation is making sequential decisions, some now and some in the future.
- Real options analysis tries to incorporate rational future decisions into the assessment of current investment decision making.
  - This future flexibility, exercised intelligently, enhances the value of capital investments.

Evaluating projects with real options

- **Four common sense approaches to real options analysis:**
  1. Use DCF analysis without considering options
  2. Calculate the project NPV without the option and add the estimated value of the real option.

     overall NPV= project NPV (based on DCF)
     + option value - option cost
  3. Use decision trees
  4. Use option pricing models



Example: Evaluating projects with real options

- Sackley Aqua Farms estimated the NPV of the expected cash flows from a new processing plant to be -$0.40 million. Sackley is evaluating an incremental investment of $0.30 million that would give management the flexibility to switch between coal, natural gas, and oil as an energy source. The original plant relied only on coal. The option to switch to cheaper sources of energy when they are available has an estimated value of $1.20 million. What is the value of the new processing plant including this real option to use alternative energy sources?
- **Answer:**

  The NPV, including the real option, should be

  Project NPV =NPV (based on DCF alone) – cost of options + value of options
  = -0.40 million -0.30 million + 1.20 million
  =$0.50 million

  Without the flexibility offered by the real option, the plant is unprofitable. The real option to adapt to cheaper energy sources adds enough to the value of this investment to give it a positive NPV.

Common capital budgeting pitfalls

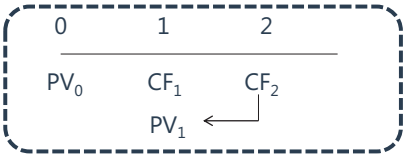
- **Common mistakes in the capital budgeting process include:**
  - Failing to incorporate economic response into the analysis.
  - Misusing standardized project evaluation templates.
  - Pet projects of senior management.
  - Basing long-term investment decisions on EPS, NI or ROE.
  - Using the IRR criterion for project decisions.
  - Poor cash flow estimation.
  - Mis-estimation of overhead costs.
  - Not using the appropriate risk-adjusted discount rate.
  - Politics involved with spending the entire capital budget.
  - Failure to generate alternative investment ideas.
  - Improper handling of sunk and opportunity costs.

Economic and accounting income

- **Economic income is equal to the after-tax cash flow plus the change in the project's market value.**
  - economic income
    = cash flow - economic depreciation
    = cash flow + (ending market value - beginning market value)
- **Economic depreciation = beginning market value - ending market value**
- **Accounting income is equal to the revenues minus costs of the project.**
  - Accounting depreciation is based on the original cost (not market value) of the investment.
  - Financing costs (e.g., interest expense) are considered as a separate line item and subtracted out to arrive at net income. In capital budgeting, financing costs are reflected in the WACC.

Economic and accounting income

- **How to understand economic income.**



$$PV_0 = (PV_1+CF_1)/(1+r)$$

$$PV_0 * (1+r) = PV_1+CF_1$$

$$EI = PV_1 + CF_1 - PV_0 = PV_0*r$$

Economic and accounting income

- **Economic income Vs. Accounting income**

Economic income	Accounting income
Economic income = ATCF + ΔMV	Accounting income= revenue – expense
Economic depreciation: the decrease in MV of investment	Accounting depreciation: the decrease in BV based on the original cost
Financing cost: ignored	Financing cost: subtracted to arrived at NI

- **The accounting income differs from the economic income for two reasons.**
  - Accounting dep. is based on the original cost of the investment, while economic dep. (beginning- ending value) is based on the market value of the asset. The economic dep. is much larger than the accounting dep., resulting in economic income much smaller than accounting income.
  - Interest exp. is deducted from the accounting income. Interest exp. is ignored when computing economic income because it is reflected in the WACC.

Economic profit approach

- **Alternative forms of determining income should theoretically lead to the same calculated NPV if applied correctly.**
  - Economic profit (EP)

  = NOPAT - $WACC = EBIT x (1-T) – WACC x capital
    - ✓ EP reflects the income earned by all capital holders.
    - ✓ The NPV based on economic profit is called the market value added (MVA)

$$NPV = MVA = \sum_{t=1}^{\infty} \frac{EP_t}{(1+WACC)^t}$$

$$V_{firm} = MVA + investment$$

Distinguish between economic income and economic profit

Residual income approach

- **Alternative forms of determining income should theoretically lead to the same calculated NPV if applied correctly.**
  - Residual income focuses on returns to equity holders.
    - ✓ $RI_t = NI_t - r_e B_{t-1}$
    - ✓ RI reflects the income to equity holders only

$$NPV = \sum_{t=1}^{\infty} \frac{RI_t}{(1+r_e)^t}$$

$$V_E = NPV + BV_E$$

Claims valuation approach

- **Alternative forms of determining income should theoretically lead to the same calculated NPV if applied correctly.**
  - **Claims valuation approach** separates operating cash flows based on the claims that equity holders and debt holders have on the asset.
    - ✓ Cash flows to debt holders are discounted at the cost of debt. (FCFCreditors)
    - ✓ Cash flows to equity holders are discounted at the cost of equity.(FCFE)
    - ✓ NPV of each set of cash flows is added together to determine the value of the company.
  - The claims valuation method calculates the value of the company, not the project. This is different from the economic profit and residual income approaches, which calculate both project and company value.

Economic income and Economic profit

- Orthotics is investing in a €200 million capital project that is being depreciated on a straight-line basis to zero over the 2-year life. The project will generate operating earnings before interest and taxes of €140 million for both years. Orthotics' WACC and cost of capital for the project is 15%, and the tax rate is 40%.
- The economic income for Orthotics for years 1 and 2 is closest to:
  A. €45 million in year 1 and €69 million in year 2.
  B. €45 million in year 1 and €24 million in year 2.
  C. €54 million in year 1 and €69 million in year 2.
- The economic profit for Orthotics in years 1 and 2 is closest to:
  A. €45 million in year 1 and €69 million in year 2.
  B. €45 million in year 1 and €24 million in year 2.
  C. €54 million in year 1 and €69 million in year 2.

Economic income and Economic profit

- **Answer to 1:**

$CF_1 = CF_2 = EBIT(1\text{-}t) + dep. = 140(1\text{-}40\%)+100=184$

0	1	2
PV_0	184	184

$$PV_0 = \frac{184}{1.15}+\frac{184}{1.15^2}=291$$

$$EI_1 = PV_0 \times r = 291\times 15\% = 45$$

$$PV_1 = \frac{184}{1.15}=160$$

$$EI_2 = PV_1 \times r = 160\times 15\% = 24$$

Economic income and Economic profit

- **Answer to 2:**

$$EP_1 = EBIT(1-t) - \$WACC = EBIT(1-t) - r\times TC_1$$
$$= 140\times(1-40\%) - 15\%\times 200 = 54$$

$$EP_2 = EBIT(1-t) - \$WACC = EBIT(1-t) - r\times TC_1$$
$$= 140\times(1-40\%) - 15\%\times 100 = 69$$

Example for Granite

						$'000
Year	**0**	**1**	**2**	**3**	**4**	**5**
Fixed capital investment	–150					
Sales		150	200	250	200	150
Variable cash expenses		75	100	125	100	75
Fixed cash expenses		20	20	20	20	20
Depreciation		30	30	30	30	30
Operating income before taxes		25	50	75	50	25
Taxes at 40 percent		10	20	30	20	10
Operating income after taxes		15	30	45	30	15
After-tax operating cash flow		45	60	75	60	45
Salvage value						10
Taxes on salvage value						4
After-tax salvage value						6
Total after-tax cash flow	–150	45	60	75	60	51
NPV (at r = 10 percent)	69.492					
IRR	26.27%					

Economic Income for Granite

Year	**1**	**2**	**3**	**4**	**5**
Beginning market value	219,492	196,441	156,086	96,694	46,364
Ending market value	196,441	156,086	96,694	46,364	0
Change in market value	–23,051	–40,356	–59,391	–50,331	–46,364
After-tax cash flow	45,000	60,000	75,000	60,000	51,000
Economic income	21,949	19,644	15,609	9,669	4,636
Economic rate of return	10%	10%	10%	10%	10%

- In Year 1, the beginning value is $219,492 and the ending value is $196,441, so the change in value is –$23,051.
- The economic income is the cash flow plus the change in value, or $45,000 + (–$23,051) = $21,949.
- The economic income for Years 2–5 is found similarly.
- The economic rate of return is the year's economic income divided by its beginning market value. Notice that the economic rate of return is precisely 10 percent each year, which was the required rate of return on the project.

Condensed Financial Statement for Granite

Year	**0**	**1**	**2**	**3**	**4**	**5**
Balance sheets:						
Assets	150,000	120,000	90,000	60,000	30,000	0
Liabilities	109,746	98,221	78,043	48,347	23,182	0
Net worth	40,254	21,779	11,957	11,653	6,818	0
Income statements:						
Sales		150,000	200,000	250,000	200,000	150,000
Variable cash expenses		75,000	100,000	125,000	100,000	75,000
Fixed cash expenses		20,000	20,000	20,000	20,000	20,000
Depreciation		30,000	30,000	30,000	30,000	30,000
EBIT		25,000	50,000	75,000	50,000	25,000
Interest expense		9,146	8,185	6,504	4,029	1,932
EBT		15,854	41,815	68,496	45,971	23,068
Taxes at 40 percent		6,342	16,726	27,399	18,388	9,227
Net income before salvage		9,513	25,089	41,098	27,583	13,841
After-tax salvage value						6,000
Net income		9,513	25,089	41,098	27,583	19,841

Condensed Financial Statement for Granite

Statements of cash flows:					
Operating cash flows:					
Net income	9,513	25,089	41,098	27,583	19,841
Depreciation	30,000	30,000	30,000	30,000	30,000
Total	39,513	55,089	71,098	57,583	49,841
Financing cash flows:					
Debt repayment	–11,525	–20,178	–29,696	–25,165	–23,182
Dividends/repurchases	–27,987	–34,911	–41,402	–32,417	–26,659
Total	–39,513	–55,089	–71,098	–57,583	–49,841
Investing cash flows	0	0	0	0	0
Total cash flows	0	0	0	0	0

- we will assume that the company borrows an amount equal to 50% of the value of the company, which is 50 percent of $219,492, or $109,746, and that it pays 8.33% interest each year on the beginning balance. With a 40 percent tax rate, the after-tax interest cost is 8.33 % (1 – 0.40) = 5.0
- Granite will maintain a 50 percent debt/value ratio on the company's debt

Economic Income, Accounting Income

Year	1	2	3	4	5
Economic income	21,949	19,644	15,609	9,669	4,636
Accounting income	9,513	25,089	41,098	27,583	19,841
Economic rate of return	10.00%	10.00%	10.00%	10.00%	10.00%
Return on equity (ROE)	23.63%	115.20%	343.71%	236.70%	291.00%
Return on assets (ROA)	16.67%	41.67%	83.33%	83.33%	83.33%

EP for Granite

Year	1	2	3	4	5[b]
Capital[a]	150,000	120,000	90,000	60,000	30,000
NOPAT	15,000	30,000	45,000	30,000	21,000
$WACC	15,000	12,000	9,000	6,000	3,000
EP	0	18,000	36,000	24,000	18,000

a Depreciation is $30,000 per year.
b The $6,000 after-tax gain from salvage is included in NOPAT in Year 5.

- NOPAT = EBIT(1 – Tax rate) = 25,000(1 – 0.40) = $15,000
- $WACC = WACC × Capital = 10% × 150,000 = $15,000
- EP = NOPAT – $WACC = 15,000 – 15,000 = $0

Residual Income for Granite

Year	1	2	3	4	5[a]
NIt	9,513	25,089	41,098	27,583	19,841
reBt – 1	6,038	3,267	1,794	1,748	1,023
RIt	3,475	21,822	39,304	25,835	18,818
[a] The $6,000 after-tax gain from salvage is included in NI in Year 5.					

- For the first year for the Granite Corporation, the net income is $9,513. The beginning book value of equity is $40,254 , and the required rate of return on equity is 15 percent. Consequently, the residual income for Year 1 is:
- $RI_t = NI_t - r_eB_{t-1} = 9,513 - 0.15(40,254) = 9,513 - 6,038 = \$3,475$

PV of residual income	$69,492
Equity investment	40,254
Debt investment	109,746
Total value	$219,492

Payment to Bondholders and Stockholders

Year	1	2	3	4	5
Interest payments	9,146	8,185	6,504	4,029	1,932
Principal payments	11,525	20,178	29,696	25,165	23,182
Total debt payments	20,671	28,363	36,199	29,194	25,114
Equity distributions	27,987	34,911	41,402	32,417	26,659

- For the Granite Corporation, the cash flows to debtholders are the interest payments and principal payments. These are valued by discounting them at the cost of debt, which is 8.33 percent. The cash flows to stockholders are the dividends and share repurchases, which are valued by discounting them at the 15 percent cost of equity.

Reading 22

Capital Structure

Framework

1. Capital Structure Objective
2. Capital Structure Theory
3. Costs and their Potential Effect on the Capital Structure
4. Static Trade-Off Theory
5. Implications for Managerial Decision Making
6. Target Capital Structure
7. Role of Debt Rating
8. Capital Structure Policy and Valuation
9. International Differences in Leverage

Capital Structure Objective

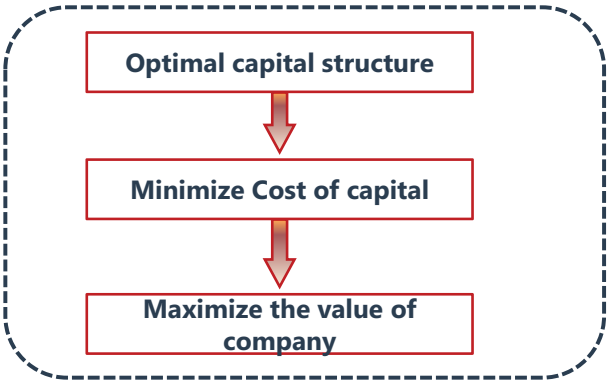
- **The objective of a company's capital structure (D/E) decision is to determine the optimal proportion of debt and equity financing that will *minimize* the firm's WACC and maximize the firm's value.**

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

D: market value of debt;
E: market value of shareholders' equity
V: market value of the firm

- **Please be noted that the optimal capital structure is not the one that makes the maximum EPS or ROE.**

Capital Structure Objective



Capital Structure Theory

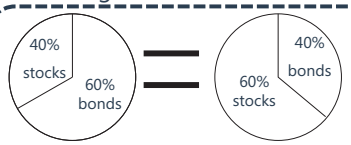
- **Capital Structure Theory**
  - MM theory 1958 → **No** taxes, **no** costs of financial distress
  - MM theory 1963 → **With** taxes, **no** costs of financial distress
  - The static trade – off theory → **With** taxes, **with** costs of financial distress

MM: Modigliani - Miller

Under different assumptions of taxes, transaction costs, and bankruptcy costs, there are different conclusions.

Capital Structure Theory

- **MM proposition 1 without taxes: capital structure irrelevance**
  - The market value of a company is not affected by the capital structure.
  - Assumptions:
    - ✓ Investors agree on the expected cash flow from a given investment;
    - ✓ Bonds and shares of stock are traded in a perfect capital market;
    - ✓ investors can borrow/lend at the risk-free rate
    - ✓ no agency costs
    - ✓ Financing decision and investment decision are independent



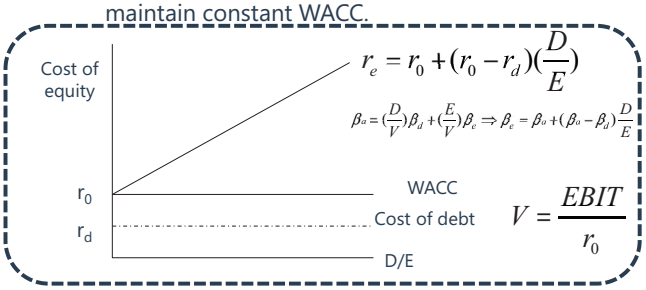
$$V_L = V_U$$

Capital Structure Theory

- **MM proposition 1 without taxes: capital structure irrelevance**
  - Value is not created by just change the leverage of a firm;
  - With the increase in leverage, the increase in equity returns is offset by increases in the risk and the associated increase in the required rate of return on equity.
  - For simplification, assume 2 firms have the same cash flow (FCFF) and uncertainty. The firm value is the same as the discount rate is the same.

Capital Structure Theory

- **MM proposition 2 without taxes: higher leverage raises the cost of equity.**
  - The **cost of equity** is a linear function of D/E.
  - Assumption: financial distress has no cost, and debtholders have prior claim to assets and income. → $r_d < r_e$
  - r_e rises with higher D/E to offset the increased use of cheaper debt to maintain constant WACC.



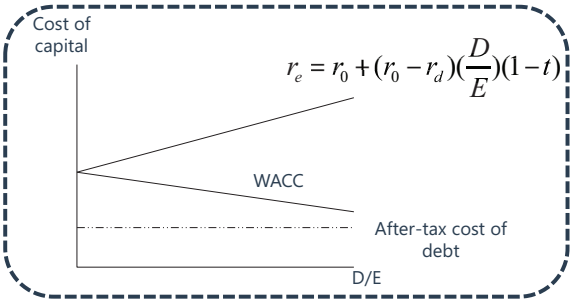
The r_0 is not determined by capital structure, but by business risk of the company.

Capital Structure Theory

- **MM proposition 1 (with taxes):**
  - the tax deductibility of interest payment creates a tax shield that adds value to the firm, and the optimal capital structure is 100% debt.

$$V_L = V_U + t \times d$$

- **MM proposition 2 (with taxes):**
  - WACC is minimized at 100% debt.



We do not consider the costs here:
- ✓ Cost of financial distress;
- ✓ Cost of bankruptcy.

$$V_L = \frac{EBIT(1-t)}{r_0}$$

Short summary for MM theory

- **Difference between Proposition 2 without taxes and with taxes is (1 - t).**
  - When t ≠ 0, (1 - t) lowers cost of leveraged equity compared to no-tax case.
    - ✓ r_e becomes greater as the company increases the debt financing, but r_e does not rise as fast as it does in the no-tax case. Because the slope coefficient $(r_0-r_d)(1-t) < (r_0-r_d)$ in the case of no taxes.
    - ✓ WACC for the leveraged company falls as debt increases, and overall company value increases.
    - ✓ If taxes are considered but financial distress and bankruptcy costs are not, debt financing is highly advantageous. In extreme, optimal capital structure is all debt.

	Without taxes	With taxes
Proposition 1	$V_L=V_U$	$V_L=V_U+t*D$
Proposition 2	$r_e= r_0+(r_0-r_d)*D/E$	$r_e= r_0+(r_0-r_d)(1-t)*D/E$

Costs of financial distress

- **Costs of financial distress are the increased costs when earnings decline and the company has trouble paying its fixed costs.**
- **The expected costs of financial distress have two components:**
  - Cost of financial distress and bankruptcy.
    - ✓ Direct costs: cash expenses associated with the bankruptcy
    - ✓ Indirect costs: foregone investment opportunities and losing the trust of customers, creditors, suppliers, and employees.
  - Probability of financial distress
    - ✓ operating leverage and financial leverage.
    - ✓ quality of management and corporate governance structure;
- **Companies whose assets have a ready second market have lower cost of financial distress:**
  - safe, tangible assets, lower cost of financial distress;
  - few tangible assets, higher cost of financial distress.

Agency costs

- **The net agency costs of equity are the costs associated with the conflict of interest between a company's managers and owners;**
  - Smaller stake the mangers have, HIGHER cost;
  - Net agency cost of equity consist of three components:
    - ✓ Monitoring costs are the costs associated with supervising management and include the expenses associated with making reports to shareholders and paying the board of directors.
    - ✓ Bonding costs are assumed by management to assure shareholders that the managers are working in the shareholders' best interest. (e.g. premiums for insurance to guarantee performance and implicit costs associated with non-compete agreements.)
    - ✓ Residual losses may occur even with adequate monitoring and bonding provisions because such provisions do not provide a perfect guarantee.
  - The better the company is governed, the lower agency cost;
  - The increase in use of debt vs. equity, decrease the agency cost.

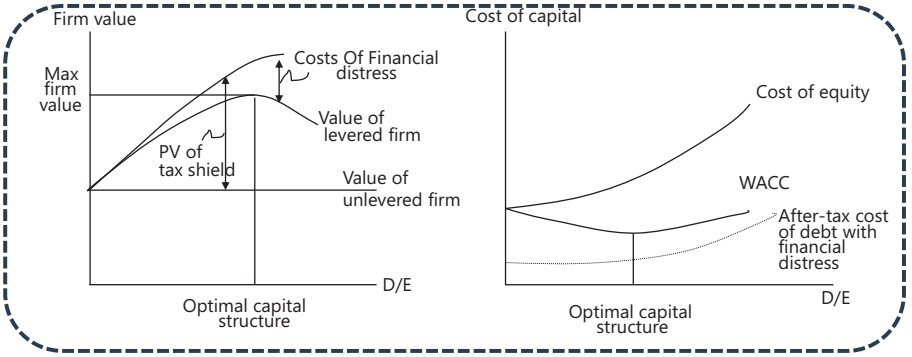
Cost of asymmetric information

- **Cost of asymmetric information result from managers having more information about a firm than investors.**
  - The provider of both debt and equity capital demand higher returns from companies with higher asymmetry in information because there is a great likelihood of agency costs.
- **Pecking order theory suggests that the management of the company prefers the way of financing that disclose less information.**
  - The pecking order is (from most favored to least favored)
    - ✓ Internally generated equity (i.e., retained earnings)
    - ✓ Debt
    - ✓ External equity (i.e., newly issued shares)
  - It predicts that the capital structure is a by-product of the individual financing decisions
  - It indicates that the management prefers to issue equity when it is overvalued; but is reluctant to issue equity when it is undervalued.
  - Issuance of equity is a negative signal of the company.

Static Trade-Off Theory

- **The static trade-off theory seeks to balance the costs of financial distress with the tax shield benefits from using debt and state that there is an optimal capital structure that has an optimal proportion debt.**

$$V_L = V_U + (t \times d) - \text{PV(Costs of Financial Distress)}$$



Static Trade-Off Theory

- **Key points of static trade-off theory:**
  - With increase in financial leverage,
    - ✓ the tax shield add value to the firm;
    - ✓ the impact of cost of financial distress, agency cost and cost of asymmetric reduce the firm value;
  - Unlike the MM proposition of no optimal capital structure, or a structure with almost all debt, static trade-off theory puts forth an optimal capital structure with an optimal proportion of debt.
    - ✓ Once the value adding from tax shield and value reduction from these costs are balanced, the company reaches a max value with lowest cost of capital → optimal capital structure.

Implications for managerial decision making

- **MM's proposition**
  - No tax: irrelevant
  - With tax: tax shield makes borrowing valuable, WACC is minimized at 100% debt

	Without taxes	With taxes
Proposition 1	$V_L=V_U$	$V_L=V_U+t*D$
Proposition 2	$r_e= r_0+(r_0-r_d)*D/E$	$r_e= r_0+(r_0-r_d)(1-t)*D/E$

- **Static trade-off theory**: Increasing the use of debt also increases the costs of financial distress. At some point, the costs of financial distress will exceed the tax benefits of debt.
  - Optimal proportion of debt

Implications for managerial decision making

- **Pecking order theory**: managers prefer to make financing choices that are least likely to send signals to investors. Pecking order (most favored to least favored) is:
  - Internally generated equity (i.e., retained earnings).
  - Debt
  - External equity (i.e., newly issued shares).

Target capital structure

- **The target capital structure**
  - The structure the firm uses over time when making capital structure decisions.
    - ✓ For managers trying to maximize the value of the firm, the target capital structure = optimal capital structure.
  - In practice, the actual capital structure will fluctuate around the target for two reasons:
    - ✓ management's exploitation of market opportunities. (e.g. A temporary rise in the firm's stock price may create a good opportunity to issue additional equity)
    - ✓ market value fluctuations. (e.g. Changes in stock and bond markets will cause fluctuations in the firm's stock and bond prices.)

Role of debt rating

- **Debt ratings** are an important consideration in the practical management of leverage.
  - Higher leverage, lower ratings of company's debt, higher costs of capital
- Because the cost of capital is tied to debt ratings, many managers have goals for **maintaining certain minimum debt ratings** when determining their capital structure policies.

Evaluating capital structure policy

- **Factors an analyst should consider when evaluating a firm's capital structure include:**
  - Changes in the firm's capital structure over time.
  - Capital structure of competitors with similar business risk.
  - Company-specific factors (e.g., better corporate governance reduce agency costs).
- **Scenario analysis is a useful tool to determine whether current capital structure policy is maximizing the value of the firm.**
  - Starting with the firm's current capital structure, an analyst can assess how changes in the firm's debt ratio may reduce the WACC and then evaluate what happens to the firm's value if the company moves toward its optimal capital structure.

International differences in leverage

- For international firms, country-specific factors may have a significant impact on a firm's capital structure policy. Observations regarding international differences in financial leverage include:
  - Total debt.
    - ✓ Companies in Japan, Italy, and France tend to have more total debt in capital structure than firms in the U.S. and the U.K.
  - Debt maturity.
    - ✓ Companies in North America tend to use longer maturity debt than companies in Japan.
  - Emerging market differences.
    - ✓ Companies in developed countries tend to use more total debt and use longer maturity debt than firms in emerging markets.

International differences in leverage

- **Major factors that explain the majority of the differences in capital structure across countries:**
  1. Institutional and Legal Factors.
     - ✓ Strength of legal system.
     - ✓ Information asymmetry.
     - ✓ taxes
  2. Financial market and banking system factors.
     - ✓ Liquidity of capital markets.
     - ✓ Reliance on banking system.
     - ✓ Institutional investor presence.
  3. Macroeconomic factors.
     - ✓ Inflation.
     - ✓ GDP growth.

International differences in leverage

1. **Institutional and Legal Factors.**
   - Strength of legal system.
     - ✓ Firms in countries with weak legal systems tend to have greater agency costs due to lack of legal protection for investors.
     - ✓ Firms in countries with strong legal systems tend to use less debt, and the debt tends to have longer maturities.
   - Information asymmetry.
     - ✓ High information asymmetry between managers and investors encourages managers to use more debt.
     - ✓ In countries where auditors and financial analysts have a greater presence, information asymmetries are reduced. Increased transparency results in lower financial leverage.
   - Taxes
     - ✓ Tax shield encourages debt financing. But it changes if dividends are taxed at a more favorable rate than interest income.
     - ✓ A favorable tax rate for dividends reduce r_e, causing firms in countries with lower tax rates on dividend income to use less debt financing.

International differences in leverage

2. **Financial market and banking system factors.**
   - Liquidity of capital markets.
     - ✓ Companies in countries with larger and more liquid capital markets use longer maturity debt than firms in countries with less liquid capital markets.
   - Reliance on banking system.
     - ✓ Companies in countries that are more reliant on the banking system than corporate bond markets tend to be more highly leveraged.
   - Institutional investor presence.
     - ✓ Institutional investors may have preferred maturity ranges for their debt investments (preferred habitat).
     - ✓ For example, life insurance companies and pension plans may exhibit a preference for long-term debt securities relative to short-term debt.
     - ✓ Firms in countries with active institutional investors issue more long-term debt compared to short-term debt. We may also observe marginally lower debt-to-equity ratios in these countries.

International differences in leverage

3. **Macroeconomic factors.**
   - Inflation.
     - ✓ Higher inflation reduces the value to investors of fixed interest payments. As a result, firms in countries with high inflation tend to use less debt financing, and the debt used has a shorter maturity.
   - GDP growth.
     - ✓ Firms in countries with higher GDP growth tend to use longer maturity debt.

International differences in leverage

➢ **Impact of country-specific factors on capital structure**

Country-specific factors	Use of Total Debt	Debt Maturity
Institutional and Legal Factors		
Strong legal system	lower	longer
Less Information asymmetry	lower	longer
Favorable tax rates on dividends	lower	N/A
Common law as opposed to civil law	lower	longer
Financial Market Factors		
More liquid stock and bond markets	N/A	longer
Greater reliance on banking system	higher	N/A
large institutional investors	lower	longer
Macroeconomic environment		
Higher inflation	lower	shorter
Higher GDP growth	N/A	longer

Reading 23

Dividends and Share Repurchases: Analysis

Framework

1. Dividends policy and company value theory
2. Factors affecting dividend policy
3. Payout policies
4. Analysis of dividend safety

Dividend policy and company value theory

➢ **Theories in dividend policy and company value:**

1. Does not matter;
2. Bird in hand;
3. Tax aversion;
4. Clientele effect;
5. Signaling;
6. Agency costs and dividend as a mechanism to control them

Dividend policy and company value theory

1. **Dividend policy does not matter**
   - Inference from MM theory;
     - ✓ Under MM assumption, no meaningful distinction between dividends and share repurchases
   - Perfect capital market assumptions;
   - Dividend is irrelevant to company value:
     - ✓ Homemade dividend by investors: if investors need dividend, they can construct their own dividend by selling sufficient shares to create cash flow;
     - ✓ **It does not mean dividend per share is irrelevant but the dividend policy is irrelevant;**

Dividend policy and company value theory

2. **Dividend policy matters: Bird in hand argument**
   - Prefer cash dividend to capital dividends as it is more certain;
     - ✓ The argument is that a company that pays dividends will have a lower cost of equity than a similar company that does not pay dividends, thus result in a higher share price.
   - MM theory contend that it is incorrect: under their assumption, current dividend does not affect the risk of future cash flow, only lower the ex-dividend price.
3. **Dividend policy matters: Tax aversion**
   - The investors prefers the way that incur lower tax;
   - Dividends are taxed at higher rates than capital gains
   - Tax-aversion theory implies that investors would want companies to have a zero dividend payout ratio so that they will not be burdened with higher tax rates.

Dividend policy and company value theory

4. Clientele effect

- Different investors desire different dividend policy due to:
  - ✓ Tax consideration: If $T_{CG} < T_D$, investor prefers capital gains.
  - ✓ Requirements of institutional investors: some institutional investors will invest only in companies that pay a dividend or have a dividend yield above some target threshold.
  - ✓ Individual investor preferences: Some investors prefer to buy stocks to spend the dividends while preserving the principal.
- The effect does not contradict with irrelevance but trend to promote stability of dividend policy;
  - ✓ If the demands of all clienteles for various dividend policies are satisfied by sufficient numbers of companies, a company cannot affect its own share value by changing its dividend policy.
  - ✓ The change would only result in a switch in clientele.

Dividend policy and company value theory

4. Clientele effect

- Tax effects the trading strategies in regard with dividend
  - ✓ Sell just before ex-dividend: $P_w-(P_w-P_b)T_{CG}$
  - ✓ Sell just after ex-dividend: $P_w-(P_X-P_b)T_{CG}+D(1-T_D)$
  - ✓ **Indifferent:** $P_w-(P_w-P_b)T_{CG} = P_X-(P_X-P_b)T_{CG}+D(1-T_D)$
  - ✓ $$\Delta P = Pw - Px = D(1-T_D)/(1-T_{CG})$$
  - ✓ Where, P_w= price before ex-dividend
    P_b= purchase price
    P_X= ex-dividend date price
    T_D= dividend tax, T_{CG}= capital gain tax
- Conclusions
  - ✓ $T_{CG} = T_D$, share drops = dividend
  - ✓ $T_{CG} < T_D$, share drops < dividend
  - ✓ $T_{CG} > T_D$, share drops > dividend

Example: Dividend vs. Capital gain

1. A firm is planning on declaring $12 in dividend. The tax rate for an investor are: T_D = 30%, T_{CG} = 15%. Compute the expected drop in stock price when the stock goes ex – dividend

2. Suppose the tax rate on capita gain is 25%, if the stock price of a company falls by 105% of the dividend amount to average when the stock goes ex – dividend, what is the tax rate on dividend for an investor in that stock?

➢ **Solution:**

- $$\Delta P = \frac{D(1-T_D)}{(1-T_{CG})} = \frac{\$12(1-30\%)}{(1-15\%)} = \$9.88$$
- $\frac{\$1(1-T_D)}{1-25\%} = \$1.05$ $T_D = 21.25\%$

Conclusions:

TCG = TD, share drops = dividend;
TCG < TD, share drops < dividend;
TCG > TD, share drops > dividend.

Dividend policy and company value theory

5. **Signaling:**
   - MM assume all investors, including outside investors, have the same information. In reality, mangers have more information (asymmetric info);
   - For outside investors, dividend is meaningful because of asymmetric info.
   - A company's BOD and management may use dividends to **signal to investors** how the company is really doing.

Dividend policy and company value theory

5. **Signaling:**
   - The information conveyed by dividend initiation is ambiguous.
     - ✓ A dividend initiation could mean that a company is optimistic about the future and is sharing its wealth with stockholders—a positive signal.
     - ✓ Initiating a dividend could mean that a company has a lack of profitable reinvestment opportunities—a negative signal.
   - An unexpected dividend increase can signal to investors that a company's future business prospects are strong and that managers will share the success with shareholders.
   - Unexpected dividend decreases or omissions are typically negative signals that the business is in trouble and that management does not believe that the current dividend payment can be maintained.

Dividend policy and company value theory

6. **Agency issues:**
   - Between shareholders and managers
     - ✓ Managers may have an incentive to overinvest (empire building). May invest in negative NPV projects.
     - ✓ One way to reduce agency cost is to increase the payout of free cash flow as dividends.
   - Between shareholders and bondholders
     - ✓ When risky debt outstanding, shareholders can pay themselves a large dividend, leaving the bondholders with a lower asset base as collateral.
     - ✓ Agency conflict between stockholders and bondholders is resolved via provisions in the bond indenture.
     - ✓ The provisions include restrictions on dividend payment, maintenance of certain balance sheet ratios, and so on.

Example - Agency Issues and Dividends

- Two dividend-paying companies A and B directly compete with each other. Both are all-equity financed and have recent dividend payout ratios averaging 35 percent. The corporate governance practices at Company B are weaker than at Company A. Recently, profitable investment opportunities for B have become fewer, although operating cash flow for A and B is strong.
- Based only on the information given, investors who own shares in both A and B are most likely to press for a dividend increase at:
  - A. Company A, because it has better growth prospects than Company B.
  - B. Company B, because a dividend increase may mitigate potential overinvestment agency problems.
  - C. Company B, because a dividend increase may mitigate potential underinvestment agency problems.

Example - Agency Issues and Dividends

- Solution:

  B is correct. Company B's strong operating cash flow in an environment of fewer profitable growth opportunities may tempt Company B's management to overinvest. The concern is increased because of Company B's relatively weak corporate governance.

Factors affecting dividend policy

- **Investment opportunities;**
  - More profitable investment opportunity, less cash dividend;
- **Expected volatility of future earnings;**
  - If earnings are volatile, firms are more cautious in *changing* dividend;
- **Financial flexibility;**
  - Firms with excess cash and a desire to maintain financial flexibility may resort to stock repurchases instead of dividends.
  - Since stock repurchase plans are not considered sticky, they don't entail reduction in financial flexibility going forward.
- **Tax considerations; (see next page)**
- **Flotation costs;**
  - Higher flotation costs, less dividend;
- **Contractual and legal restrictions**
  - Impairment of capital rule: dividend paid < retained earnings
  - Debt covenants: require a certain liquidity ratio and coverage ratio before dividend payout.

Tax consideration – Taxation methods

- **Tax consideration: Effective tax rate depends on the tax system**
  - Double-taxation
    - ✓ Earnings are taxed at the corporate level regardless of whether they are distributed as dividends, and dividends are taxed again at the shareholder level.
    - ✓ **Effective tax rate** = 1 x corporate tax rate + (1-corporate tax rate) x (individual tax rate)
  - Split-tax rate system
    - ✓ Corporate earnings as dividends are taxed at a lower rate at the corporate level than retained earnings.
    - ✓ At the individual level, dividends are taxed as ordinary income. Earnings as dividends are still taxed twice, but with relatively low corporate tax rate. The effect is to offset the higher (double) tax rate applied to dividends at the individual level.

Tax consideration – Taxation methods

- **Tax consideration: Effective tax rate depends on the tax system**
  - Tax-imputation system
    - ✓ taxes are paid at corporate level but are attributed to the shareholder, **all taxes are effectively paid at the shareholder rate**.

      Effective tax rate = shareholder's marginal tax rate.
    - ✓ If shareholder's marginal tax rate > company's, shareholder pays the difference between the two rates.
    - ✓ If the shareholder tax bracket is < company rate, the shareholder would receive a tax credit equal to the difference between the two rates.

Tax consideration – Dividends or Capital gains

- **Tax consideration: Shareholder Preference for Current Income vs. Capital Gains**
  - All else equal, the lower an investor's T_D relative to T_{CG}, the stronger preference for dividends.
  - Other issues also impinge on this preference
    - ✓ The investor may buy high-payout shares for a tax-exempt retirement account. Even if $T_D < T_{CG}$, it is not clear that shareholders will necessarily prefer higher dividends.
    - ✓ Tax-exempt institutions (e.g. pension funds and endowment funds) are major shareholders in most industrial countries and are exempt from both T_D and T_{CG}. (indifferent)
    - ✓ T_{CG} not have to be paid until being sold, whereas T_D must be paid in the year received, even if reinvested.

Example: Double taxation system

- A U.S. company's annual earnings are $300, and the corporate tax rate is 35%. Assume that the company pays out 100% of its earnings as dividends. Calculate the effective tax rate on a dollar of corporate earnings paid out as dividends assuming 15% tax rate on dividend income.
- **Answer:**

Earnings	$300.00
(—) Tax @ 35%	-105.00
Earnings after tax	195.00
Dividends (100% payout)	195.00
Tax on dividends (@ 15%)	-29.25
After tax dividend to investor	165.75

- Effective (double) tax rate = (300-167.75) / 300 = 44.75%
  - Or, 0.35 + (1-0.35)(0.15) = 0.4475 or 44.75%

Example: Split-rate system

- A German company's annual pretax earnings are €300. The corporate tax rate on retained earnings is 35%, and the corporate tax rate that applies to earnings paid out as dividends is 20%. Assuming that the company pays out 50% of its earnings as dividends, and the individual tax rate that applies to dividends is 30%, calculate the effective tax rate on one euro of corporate earnings paid out as a dividend.
- **Answer:**
  - effective tax rate on income distributed as dividends = 20% + [(1 - 20%) x 30%] = 44%
  - Note that under a split-rate system, earnings that are distributed as dividends are still taxed twice but at a lower corporate tax rate (corporate rate for distributed income).

Example: Tax imputation system

	Marginal shareholder tax rate	
	15%	47%
Pretax income	$100	$100
Taxes at 30% corporate tax rate	30	30
Net income after tax	70	70
Dividend assuming 100% Payout	70	70
Shareholder taxes	15	47
Less tax credit for corporate payment	30	30
Tax due from shareholder	(15)	17
Effective tax rate on dividend	15/100=15%	47/100=47%

- If the shareholder's marginal tax rate is higher than the company's, the shareholder pays the difference between the two rates.

Payout policies

- **Types of dividend policies**
  - Stable dividend policy;
  - Constant dividend payout ratio policy; (seldomly used)
  - Residual dividend policy.
- **Stable dividend policy**
  - Company tries to align its dividend growth rate with the company's long-term growth rate to provide a steadily increasing dividend;
  - **Target payout adjustment model**;

    Expected dividend=(previous dividend)
    + [(expected increase in EPS)
    * (target payout ratio) * (adjustment factor)]

    adjustment factor = 1 / number of years over which the adjustment in dividends will take place

Example: Target payout approach

- Last year, Buckeye, Inc. , had earnings of $ 3.50 per share and paid a dividend of $0.70 . In the current year, the company expects to earn $ 4.50 per share. The company has a 35 % target payout ratio and plans to bring its dividend up to the target payout ratio over a 5-year period . Calculate the expected dividend for the current year.

- **Answer :**

  expected dividend = $ 0.70 + [($ 4.50 - $3.50) X 0.35 X (1/5)]
  = $0.7 + ($1.00 X 0.35 X 0.2)
  = $0.7 + 0.07
  = $0.77

Payout policies

- **Residual dividend model**
  - Dividends are based on earnings less funds the firm retains to finance the equity portion of its capital budget.
  - The model is based on the firm's:
    - ✓ investment opportunity schedule;
    - ✓ target capital structure;
    - ✓ access to and cost of external capital.

Payout policies

- **Residual dividend model**
  - Steps to determine the target payout ratio:
    1) identify the optimal capital budget.
    2) determine the amount of equity needed to finance that capital budget for a given capital structure.
    3) meet equity requirement to the maximum extent possible with retained earnings.
    4) pay dividends with the "residual" earning that are available after the needs of the optimal capital budget are supported.

Dividend = Earnings

– (Capital budget * Equity% in capital structure)

or zero, whichever is greater

Example: Residual dividend model

- Larson Company has $ 1,000 in earnings and $900 in planned capital spending. Larson has a target debt-to-equity ratio of 0.5. This implies a capital structure of one-third debt and two-thirds equity.
- If the firm reinvests all of its earnings, its equity will increase by $1,000. To maintain the target capital structure, the firm must borrow an additional $500. Thus, the total amount of funds that can be generated without selling new equity is $ 1,000 + $ 500 = $ 1,500.
- If planned capital spending is less than the total amount of capital available (e.g. $ 900 versus $ 1,500) the firm can pay dividends.
  - To maintain the target capital structure, the $ 900 capital spending will be financed with [(1 / 3) ($ 900)] = $ 300 of debt and [(2 / 3) ($ 900)] = $600 of equity.
  - The residual amount is ($ 1,000 - $ 600) = $ 400 , so dividends under the residual method would be $ 400.

Payout policies

- **Residual dividend model**
  - Advantages:
    - ✓ easy for the company to use;
    - ✓ maximizes allocation of earnings to investment.
  - Disadvantage:
    - ✓ dividend fluctuates with investment opportunities and earnings;
    - ✓ uncertainty cause higher excepted return and lower valuation.

$$r_s \uparrow \Rightarrow P_0 = \frac{D_1}{r_s - g} \downarrow$$

  - Long-term residual dividend. Some firms try to mitigate the disadvantages by forecasting capital budget over a longer time frame. The leftover earnings are paid out as dividends in relatively equal amounts each year.
    - ✓ Any excess cash flows are distributed through share repurchases.

Example: Residual Dividend Approach

- Target Debt/Equity Ratio of 30/70 (dollars in millions)

Capital budget	$100	$150
Earnings	$100	$100
Target D/E	30/70	30/70
Capital spending	$100	$150
Financed from new debt	0.3*100=$30	0.3*150=$45
Financed from RE	0.7*100=$70	(0.7*150>100)=$100
Financed from new equity or debt	$0	$5
Residual cash flow = residual dividend	$100-$70=$30	$100-$100=$0
Implied payout ratio	30/100=30%	0/100=0%

- The $150 million in capital spending requires $105 million in equity ($150*0.7), which is greater than the company's total earnings of $100 million. The company would probably finance the shortfall with debt, temporarily deviating from target capital structure, rather than use more costly external equity financing.

Payout policies - Repurchase vs. Cash dividend

- **Repurchase vs. Cash dividend**
  - Since shares are bought using a company's own cash, a share repurchase can be considered an alternative to a cash dividend.
  - Rationales for share repurchase:
    - ✓ Tax advantages: $T_D > T_{CG}$, share repurchase have tax advantage over cash dividends.
    - ✓ Share price support/signaling;
    - ✓ Added flexibility
      - ◆Unlike dividends, share repurchases are not a long-term commitment.
      - ◆managers have discretion over "market timing" repurchases.
    - ✓ Offsetting dilution from employee stock options;
    - ✓ Increase financial leverage
      - ◆Share repurchases increase leverage.
      - ◆modify the capital structure by decreasing equity percentage.

Example: Share repurchase and cash dividend

- SPI has 20m shares outstanding with a current market value of $50 per share. SPI made $100m in profits for the recent quarter, and since only 70% of these profits will be reinvested back into the company, SPI's Board of Directors is considering two alternatives for distributing the remaining 30% to shareholders:
  - Pay a cash dividend of $30m / 20m shares = $1.50 per share.
  - Repurchase $30m worth of common stock.
- Assume that dividends are received when the shares go ex-dividend, the stock can be repurchased at the market price of $50 per share, and there are no differences in tax treatment between the two alternatives.
- How would the wealth of an SPI shareholder be affected by the board's decision on the method of distribution?

Example: Share repurchase and cash dividend

Answer:

(1) Cash dividend

After the shares go ex-dividend, a shareholder of a single share would have $1.50 in cash and a share worth $50 - $1.50 = $48.50.

The ex-dividend value of $48.50 can also be calculated as the market value of equity after the distribution of the $30 million, divided by the number of shares outstanding after the dividend payment.

[(20m)($50) - $30m] / 20m = $48.50

Total wealth from the ownership of one share = $48.50 + $1.50 = $50

(2) Share repurchase

With $30m, SPI could repurchase $30m / $50 = 0.6m shares of common stock. The share price after the repurchase is calculated as the market value of equity after the $30m repurchase divided by the shares outstanding after the repurchase:

[(20m)($50) - $30m] / (20m – 0.6m) = $50

Total wealth from the ownership of one share = $50.

After-tax cost of debt < earnings yield

- **SPI plans to borrow $30 million that it will use to repurchase shares. SPI's CFO has compiled the following information:**
  - Share price at the time of buyback = $50.
  - Shares outstanding before buyback = 20m
  - EPS before buyback = $5.00.
  - Earnings yield = $5.00 / $50 = 10%.
  - After-tax cost of borrowing = 8%.
  - Planned buyback = 600,000 shares.
- **Calculate the EPS after the buyback.**

After-tax cost of debt < earnings yield

- **Answer:**
  - Total earnings = $5.00 x 20,000,000 = $100,000,000

$$\text{EPS after buyback} = \frac{\text{Total earnings - after tax cost of funds}}{\text{shares outstanding after buyback}}$$

$$= \frac{\$100,000,000 - (600,000\text{shares} \times \$50 \times 0.08)}{(20,000,000 - 600,000)\text{shares}}$$

$$= 5.03$$

  - Since the after-tax cost of borrowing of 8% is less than the 10% earnings yield (E/P) of the shares, the share repurchase will increase the company's EPS.

After-tax cost of debt > earnings yield

- SPI plans to borrow $30 million that it will use to repurchase shares; creditors perceive a significant credit risk, and the after-tax cost of borrowing has jumped to 15%. Using the other information from the previous example, calculate the EPS after the buyback.

$$\text{EPS after buyback} = \frac{\text{Total earnings - after tax cost of funds}}{\text{shares outstanding after buyback}}$$

$$= \frac{\$100{,}000{,}000 - (600{,}000\text{shares} \times \$50 \times 0.15)}{(20{,}000{,}000 - 600{,}000)\text{shares}} = 4.92$$

- Because the after-tax cost of borrowing of 15% > earnings yield of 10%, the added interest paid reduces earnings, and the EPS after the buyback < the original $5.00.
- **Conclusion:**
  - share repurchase using borrowed funds increase EPS if the after-tax cost of debt < earnings yield of the shares before the repurchase.

Payout policies

- **Global trends in payout policy**
  - A lower proportion of U.S. companies pay dividends as compared to their European counterparts.
  - Globally, in developed markets, the proportion of companies paying cash dividends has trended downwards over the long term.
  - The percentage of companies making stock repurchases has been trending upwards in the United States since the 1980s and in the United Kingdom and continental Europe since the 1990s.

Analysis of dividend safety

- **Calculation of dividend coverage ratio**
  - Net income method:

    Dividend coverage ratio = net income / dividend paid
  - Free cash flow method:

    FCFE coverage ratio = FCFE / (dividends + share repurchases)

Example: Dividend sustainability analysis

Year Ending 31 December	2009	2008
NI	$ 10,483	$ 23,931
CFO	$ 19,373	$ 29,632
Capital Expenditures (Fclnv)	$ 19,843	$ 19,666
Net borrowing	$ 1,659	$ 1,682
Dividends paid	$ 5,373	$ 5,261
Stock repurchases	$ (168)	$ 6,821

1. Using the information provided, calculate: (a) Dividend payout ratio; (b) Dividend coverage ratio; (c) FCFE coverage ratio
2. Discuss the trend in dividend coverage ratio and compare it to FCFE coverage ratio
3. Is Chevron's dividend sustainable?

Example: Dividend sustainability analysis

1. a. Dividend payout ratio = dividend / net income.

   2008: 5,261 / 23,931 = 0.22 or 22%

   2009: 5,373 / 10,483 = 0.51 or 51%

   b. Dividend coverage ratio = net income / dividend

   2008: 23,931 / 5,261 = 4.55

   2009: 10,483 / 5,373 = 1.95

   c. FCFE = CFO - FClnv + net borrowings

   2008: FCFE = 29,632 - 19,666 + 1,682 = 11,648

   2009: FCFE = 19,373 - 19,843 + 1,659 = 1,189

   FCFE coverage ratio = FCFE / (dividends + share repurchases)

   2008: 11,648 / (5,261 + 6,821) = 0.96

   2009: 1,189 / [5,373 + (-168)] = 0.23

Example: Dividend sustainability analysis

2. The dividend coverage ratio has decreased considerably from 4.55 in 2008 to 1.95 in 2009.

   FCFE coverage ratio has also decreased significantly from 0.96 to 0.23.

   It appears that the dividend sustainability is lower in 2009 as compared to 2008.

3. Chevron's dividend coverage has decreased significantly from 2008 to 2009. Still, even with this decrease, Chevron's dividend coverage is almost 2 times.

   Chevron's FCFE coverage ratio has also decreased dramatically from 2008 to 2009. This is despite the fact that the company stopped its share repurchase plan in 2009 (in fact it issued additional stock-most likely to provide shares for exercise of employee stock options).

   Additionally, even if we consider 2009 to be a bad year due to a downturn in oil prices, the 2008 ratio is still below one. FCFE coverage ratio analysis therefore suggests that Chevron's payout policy is unsustainable for the long run.

Reading 24

Corporate Performance, Governance, and Business Ethics

Framework

1. Stakeholders of a company
2. Stakeholders Impact Analysis
3. An agency relationship
4. Roots of unethical behavior
5. Ethical considerations
6. Philosophical Approaches to Ethics

Stakeholders of a company

- A company's stakeholders can be divided into internal stakeholders and external stakeholders.

Internal Stakeholders	
Classification	Interests and Concerns
Stockholders Employees Managers Board members	Maximize the return on their investment Salary, job satisfaction, etc.

External Stakeholders	
Classification	Interests and Concerns
Customers Suppliers Creditors Governments Unions Local communities General public	Reliable products Revenues and dependable buyers Receive principle and interest on time Companies to obey the rules Union members' benefit Responsible citizens The quality of life will be improved

Stakeholders Impact Analysis

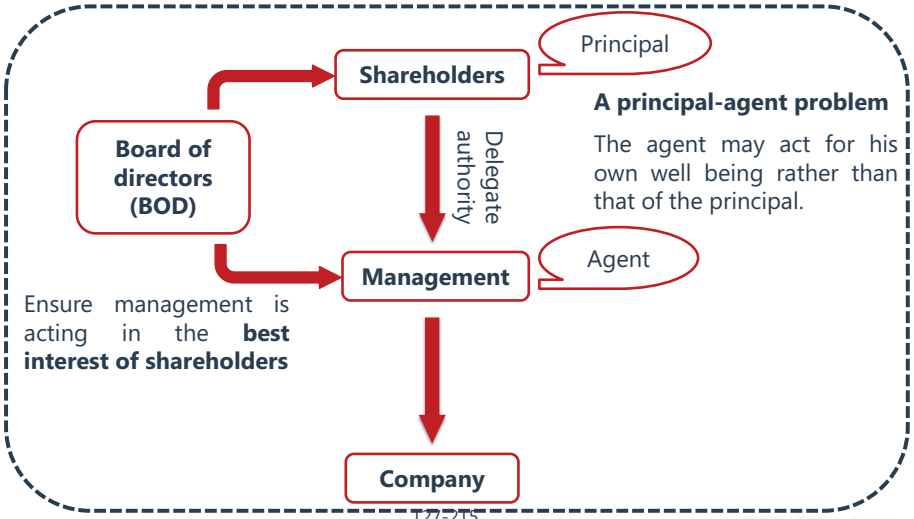
- **The reason of a stakeholders impact analysis**
  - The goals of different groups of stakeholders may conflict. A company must identify the most important stakeholders and give highest priority to pursuing strategies that satisfy their needs.
- Three stakeholder groups must be satisfied above all others if a company is to survive and prosper: customers, employees, and stockholders.

Maximize Shareholders' return → **Maximize the company' long-run profitability**

- **Conflict of interest**
  - Not all stakeholder groups want the company to maximize its long-run profitability and profit growth. Suppliers want to receive higher prices for their goods and services. Customers want to receive lower prices for the products they purchase from the company.

An agency relationship

- **A principal – agent relationship**



An agency relationship

- An agency relationship occurs when an individual, referred to as the agent, act on behalf of another individual, who is referred to as the principal. Such a relationship creates the potential for a principal-agent problem where the agent may act for his own well being rather than that of the principal.
- **Potential conflicts between**
  - **managers and shareholders:** management may act for their own interests rather than those of shareholders
    - ✓ Using funds to expand the size of the firm (empire building).
    - ✓ Granting excessive compensation and perquisites.
    - ✓ Investing in risky ventures.
    - ✓ Not taking enough risk.

An agency relationship

- **Potential conflicts between**
  - **Directors and shareholders:** directors should help ensure that management is acting in shareholders' best interest. Directors may align more with management interests rather those of shareholders.
    - ✓ Lack of independence.
    - ✓ Board members have personal relationships with management.
    - ✓ Board members have consulting or other business agreements with the firm.
    - ✓ Interlinked boards.
    - ✓ Directors are overcompensated.
- **Effective corporate governance systems are designed to monitor management's activities, reward good performance, and discipline managers who do not act in the best interests of shareholders.**

An agency relationship

- Suggestion for mitigating agency problems
  - Shape the behavior of agents so that they act in accordance with the goals set by principals.
  - Reduce the information asymmetry between agents and principals.
  - Develop mechanisms for removing agents who do not act in accordance with the goals of principals and mislead them.

Roots of unethical behavior

- Unethical behavior often arises in a corporate setting when managers decide to put the attainment of their own personal goals, or the goals of the enterprise, above the fundamental rights of one or more stakeholder groups.
  - **Self-dealing** occurs when managers find a way to feather their own nests with corporate monies.
  - **Information manipulation** occurs when managers want to enhance their own financial situation or the competitive position of the firm.
  - **Anticompetitive behavior** covers a range of actions aimed at harming actual or potential competitors.
  - **Opportunistic exploitation** violates the rights of suppliers.
  - **Substandard working conditions** arise when managers want to reduce company's costs of production.
  - **Environmental degradation** occurs when the firm takes actions that directly or indirectly result in pollution or other forms of environmental harm.
  - **Corruption** occurs when managers pay bribes to gain access to lucrative business contracts.

Roots of unethical behavior

- Root cause of unethical behavior
  - Personal ethical code.
  - Unconscious conduct of behaving unethically.
  - Organizational culture that de-emphasizes business ethics and considers all decisions to be purely economic ones.
  - Pressure from top management to meet performance goals.
  - Unethical leadership.

Ethical considerations

- **managers can and should do at least seven things to ensure that basic ethical principles are adhered to and that ethical issues are routinely considered when making business decisions.**
  1. favor hiring and promoting people with a well-grounded sense of personal ethics.
  2. build an organizational culture that places a high value on ethical behavior.
  3. make sure that leaders within the business not only articulate the rhetoric of ethical behavior but also act in a manner that is consistent with that rhetoric.
  4. put decision-making processes in place that require people to consider the ethical dimension of business decisions.
  5. hire ethics officers.
  6. put strong governance processes in place.
  7. act with moral courage.

Philosophical Approaches to Ethics

- **The Friedman Doctrine** (stockholder theory)
  - A company's only responsibility is to increase its profits. A company should have no "social responsibility" to the public or society because its only concern is to increase profits for itself and for its shareholders.
    - ✓ Weakness: have no regard for potential harm, justice.
- **Utilitarian and Kantian Ethics**
  - From a utilitarian perspective, the best decisions are those that produce the greatest good for the greatest number of people.
    - ✓ Weakness: have no regard for potential harm, justice.
  - Kantian ethics indicate that people are not instruments, like a machine. People have dignity and need to be respected as such.
    - ✓ Weakness: have no place for moral emotions or sentiments.

Philosophical Approaches to Ethics

- **Rights Theories**
  - Rights theories recognize that human beings have fundamental rights and privileges. Rights establish a minimum level of morally acceptable behavior. (e.g. the right to free speech)
- **Justice Theories**
  - The first principle is that each person should be permitted the maximum amount of basic liberty compatible with a similar liberty for others. Rawls takes these liberties to be political liberty (the right to vote), freedom of speech and assembly, liberty of conscience and freedom of thought, the freedom and right to hold personal property, and freedom from arbitrary arrest and seizure.
  - The second principle is that once equal basic liberty is ensured, inequality in basic social goods— such as income, wealth, and opportunities—is to be allowed only if it benefits everyone.

Reading 25

Corporate Governance

Framework

1. What Is The Corporate Governance
2. Three Major Business Forms
3. Responsibilities of The Board of Directors
4. Corporate Governance Best Practices
5. Corporate Governance Policies: Investors And Analysts Should Assess
6. The Strength And Effectiveness of A Corporate Governance System

What is the corporate governance?

- **Corporate governance is a system of principles, policies, procedures, and clearly defined responsibilities and accountabilities used by stakeholders to overcome conflicts of interest inherent in the corporate form.**
- **Corporate governance has two major objectives:**
  1. Eliminate or reduce conflicts of interest.
  2. Use the company's assets in a manner consistent with the best interests of investors and other stakeholders.
- **Core attributes of effective corporate governance system:**
  - Delineation of the **rights** of shareholders and other core stakeholders;
  - Clearly defined manager and director governance **responsibilities** to shareholders; (what to do)
  - Identifiable and measureable **accountabilities** for the performance of the responsibilities; (how to deal with bad performance)
  - **fair** and equitable treatment in dealings between managers, directors, and shareholders.
  - complete **transparency** and accuracy in disclosures regarding operations, performance, risk, and financial position.

Three major business forms

- **Sole proprietorships are owned and operated by a single individual. Liability unlimited, easy to set up.**
  - Conflicts between management and owners don't exist,
  - Conflicts of interest for a sole proprietorship involve creditors and suppliers.
- **Partnerships are composed of two or more owner. Liability unlimited, similar to sole proprietorship, more recourses. Pool knowledge and capital, as well as share in business risks.**
  - Conflicts also involve creditors and suppliers.
  - Potential conflicts between partners are addressed by creating partnership contracts that delineate the roles and responsibilities of each partner.

Three major business forms

- **Corporations are distinct legal entities that have rights similar to those of an individual person. Managers empowered to act as agents of the company.**
  - Advantages:
    - ✓ Easier to raise large amounts of capital.
    - ✓ Owners need not to be an expert. Any individual with sufficient capital can become a shareholder.
    - ✓ Ownership stakes transferable.
    - ✓ Limited liability.
  - Disadvantage:
    - ✓ Corporate shareholders have difficulty monitoring a firm's operations and the actions of management.
    - ✓ Separation of ownership and control creates the potential for conflicts between management and shareholders.

Responsibilities of the board of directors

- **Responsibilities of the board of directors:**
  1) institute corporate values and corporate governance mechanisms
  2) Ensure that the firm meets and complies with all legal and regulatory requirements in a timely manner.
  3) Create long-term strategic objectives for the company
  4) Determine management's responsibilities
  5) Regularly evaluate the performance of the CEO
  6) Require management to supply the board with complete and accurate information for the board to make decisions.
  7) Meet regularly
  8) Ensure board members are adequately trained to perform board functions

Evaluate effectiveness of BOD

- **Analyst might evaluate the board of directors in following aspects:**
  1. Board composition and independence;
  2. Independent chairman of the board;
  3. Qualification of directors;
  4. Annual election of directors;
  5. Annual self-assessment;
  6. Separate sessions of independent directors;
  7. 3 committees (audit, nominating and compensation);
  8. Independent or expert legal counsel;
  9. Statement of policies;
  10. Disclosure and transparency;
  11. Insider or related party transactions;
  12. Shareholder proxy votes;

Evaluate effectiveness of BOD

1. **Board composition and independence**
   - **Best practice**: at least three-quarters of board members should be independent.
   - Factors that often indicate a lack of independence include:
     - ✓ Former employment with the company.
     - ✓ Business relationships
     - ✓ Personal relationships
     - ✓ Interlocking directorships
     - ✓ Ongoing banking or other creditor relationships
2. **Independent chairman of the board**
   - Many companies have a single individual serve the dual role of CEO and Chairman of the Board.
   - Independence of the chairman of the board does not guarantee that the board will function properly, but should be regarded as a necessary condition, even if it is not a sufficient one.

Evaluate effectiveness of BOD

3. **Qualification of directors**
   - Best practice:
     - ✓ board members have the requisite industry, strategic planning, and risk management knowledge (Expertise in the industry)
     - ✓ not serve on more than two or three boards (dedication to the board)
     - ✓ show a commitment to investor interests and ethical management and investing principles. (dedication to investors)

Evaluate effectiveness of BOD

4. **Annual election of directors**
   - Proponents of staggered elections say that they ensure board continuity.
   - But strong corporate governance practice says that staggered elections limits the power of shareholders and doesn't allow changes to the board composition to occur quickly.
   - Annual elections force directors to make more careful decisions and be more attentive to shareholders because they can cast a vote to keep or eliminate a director each year.

Evaluate effectiveness of BOD

5. **Annual self-assessment**
   - Boards should evaluate and assess their effectiveness at least annually.
   - Should review:
     - ✓ Board's effectiveness as a whole
     - ✓ Performance of board members
     - ✓ Board committee activities
     - ✓ Effectiveness in monitoring and overseeing their specific functions
     - ✓ Future needs of the board
     - ✓ Report of the board self-assessment.

Evaluate effectiveness of BOD

6. **Separate sessions of independent directors**
   - **Best practice** requires independent board members to meet at least annually, preferably quarterly, in separate sessions without management in attendance.
   - Enhance the board's effectiveness by improving the cooperation among board members.

Evaluate effectiveness of BOD

7. **3 committees**
   - Audit committee
     - ✓ Best practice:
       - ◆consists only of independent directors
       - ◆has expertise in financial and accounting matters
       - ◆has full access to and the cooperation of management
       - ◆meets with auditors at least once annually
   - Nominating committee
     - ✓ Best practice
       - ◆nominating committee consists only of independent directors
   - Compensation committee
     - ✓ Best practice
       - ◆base salary and perquisites as a small percentage of compensation,
       - ◆with bonuses, stock options, and grants of restricted stock making up the majority of a senior manager's income

Evaluate effectiveness of BOD

8. **Independent or expert legal counsel**
   - The BOD should hire expert legal counsel to fulfill its fiduciary duties and assess the company's compliance with regulatory requirements.
   - poor corporate governance:
     - ✓ Internal corporate counsel to advise the BOD
   - Best practice
     - ✓ the board use independent, outside counsel whenever legal counsel is required.

Evaluate effectiveness of BOD

9. **Corporate governance policies: Should assess the following:**
   - Codes of ethics.
   - Directors' oversight, monitoring, and review responsibilities, including statements regarding internal controls, risk management, audit and accounting disclosure policies, regulatory compliance, nominations, and compensation.
   - Management's responsibility to the board. Provide complete information and timely information to board members, and to provide directors with direct access to the company's control and compliance functions.
   - Reports of directors' oversight and review function
   - Board self assessments
   - Management performance assessments
   - Director training.

Evaluate effectiveness of BOD

10. **Disclosure and transparency**
    - Investors depend on timely, complete, and accurate financial statements to value securities, inaccurate financial data can result in mispriced securities, thus reduce the efficiency of financial markets.
    - **Best practice**
      - ✓ more disclosure is better
      - ✓ A company should provide information about organization structure, corporate strategy, insider transactions, compensation policies, and changes to governance structures.

Evaluate effectiveness of BOD

11. **Insider or related party transactions**
    - The analyst should assess the company's policies concerning related-party transactions, whether the company has entered into any such transactions, and, if so, what the effects are on the company's financial statements.
    - **Best practice**
      - ✓ Any related-party transaction should require the prior approval of the BOD and a statement that such transactions are consistent with company policy.

Evaluate effectiveness of BOD

12. **Shareholder proxy votes**
    - A clear indicator of the extent to which directors and executives take seriously their fiduciary responsibility to shareholders is the response of the company to shareholder votes on proxy matters.
    - If an important matter such as executive compensation, a merger, or a governance issue is put to a shareholder vote and management ignores the result of the vote, it is obvious that management is not motivated by shareholder opinion as to what is in the best interest of the shareholders.

Environmental, Social, and Governance Factors

- **ESG factors**
  - Environmental risk: For example, related to greenhouse gas emissions that may cause climate change.
  - Social risk: Such as labor rights or occupational safety.
  - Governance risk: The effectiveness of the firm's governance structure.
- **The risks from these ESG factors can be categorized as follows:**
  - Legislative and Regulatory Risk
    - ✓ Governmental laws and regulations directly or indirectly affecting a company's operations will change with potentially severe adverse effects on the company's continued profitability and even its long-term sustainability.
    - ✓ investors who consider ESG factors and monitor regulatory and legislative developments for the companies they follow will be better equipped to make sound investment decisions.

Environmental, Social, and Governance Factors

  - Legal risk
    - ✓ Failures by company managers to effectively manage ESG factors will lead to lawsuits and other judicial remedies, resulting in potentially catastrophic losses for the company.
    - ✓ To evaluate the level of legal risk, should examine the company's regulatory filings, such as form 10-K, and consider the industry that the firm operates in, as well as its specific operations.
  - Reputational Risk
    - ✓ Companies with management that has been seen in the past to show insufficient regard for ESG factors will be valued at a lower market value compared to companies that manage these risk exposures suitably.

Environmental, Social, and Governance Factors

- Operating Risk
  - ✓ Operating risk refers to the possibility that a firm will be forced to modify an operation, or shut it down altogether, due to impact of ESG factors.
- Financial Risk
  - ✓ the risk that the ESG risk factors will result in a monetary cost to the firm or shareholders.
  - ✓ analysts should be sure to examine all possible sources of ESG risk when analyzing a company and include these potential risk impacts in the valuation.

The strength & effectiveness

- The strength and effectiveness of a corporate governance system has a direct and significant impact on the value of a company.
  1) **Strong/effective** corporate governance system has higher measures of profitability and generates higher returns for shareholders.
  2) **Weak/ineffective corporate** governance system increases the risk to investors, thus reducing the value of the company. Even cause a company to go bankrupt.
- Risks of an ineffective corporate system include:
  1) **Financial disclosure risk.** Incomplete, misleading, or materially misstated.
  2) **Asset risk.** Excessive compensation and perks.
  3) **Liability risk.** Off-balance sheet obligations reduce shareholders' value.
  4) **Strategic policy risk**. Acquisitions may increase the size of the firm and improve management's prestige and perhaps its pay, but ultimately destroy shareholder value

Reading 26

Mergers and Acquisitions

Framework

1. Categorize Merger And Acquisition Activities
2. Bootstrapping *
3. The Industry Life Cycle And Merger Motivations
4. Key Differences Between Forms of Acquisition
5. Method of Payment And US Antitrust Legislation
6. Takeover Defense Mechanisms: Pre-offer And Post-offer
7. The Herfindahl-Hirschman Index (HHI)
8. Valuing A Target Company：Three Basic Methods
9. Evaluating A Merger Bid
10. Downsizing Operations Through Corporate Restructuring

Categorize merger and acquisition activities

- **Types of mergers**
  1) In **a horizontal merger**, the two businesses operate in the same or similar industries, usually as competitors. Two reasons:
     - ✓ Pursuit of economies of scale, which are savings achieved through consolidation of operations and elimination of duplicate resources.
     - ✓ To increase market power
  2) In **a vertical merger**, the acquirer buys another company in the same production chain. Including forward integration to ultimate consumers and backward integration to suppliers
  3) In **a conglomerate merger**, the acquirer buys another company unrelated to its core business. There are few synergies from combining the two companies.
     - ✓ By investing in companies from a variety of industries, companies hoped to reduce the volatility of the conglomerate's total cash flows.
     - ✓ Company level diversification is not necessarily in the shareholders' best interests.

Categorize merger and acquisition activities

- **Forms of integration**
  1) In **a statutory merger**, the acquiring company acquires all of target's assets and liabilities.
     - ✓ A + B = A
  2) In **a subsidiary merger**, the target company becomes a subsidiary of the purchaser.
     - ✓ A + B = A + B
  3) With **a consolidation**, both companies cease to exist in their prior form, and they come together to form a completely new company.
     - ✓ A + B = C

Categorize merger and acquisition activities

- **Merger motivations**
  1. Synergies,
     - ✓ 1 + 1 > 2,
     - ✓ cost saving due to economies of scale,
     - ✓ sales synergies due to cross-selling, expanded market share, or higher prices from reduced competition.
  2. Achieving more rapid growth,
     - ✓ Making investments internally (**organic growth**) or buying the necessary resources externally (**external growth**).
     - ✓ Faster to grow externally. Growth through M&A is common for a company in a mature industry.
     - ✓ External growth can mitigate risk, less risky than to enter an unfamiliar market and establish resources internally.
  3. Increasing market power,
     - ✓ both vertical and horizon integration increase market power.
  4. Gaining access to unique capabilities and resources,

Categorize merger and acquisition activities

- **Merger motivations**
  5. Diversification,
     - ✓ Not in the best interest of the conglomerate's shareholders.
  6. Bootstrapping earnings
     - ✓ Possible to create the illusion of synergies or growth
  7. Personal benefits for managers.
     - ✓ Manger's compensation highly related to company size;
     - ✓ Corporate executives may be motivated by self-aggrandizement.
  8. Tax benefits
     - ✓ A target with tax losses has the tax shield, but not legally approved if the primary reason for merger is tax avoidance.
  9. Unlocking hidden value.
  10. Achieving international business goals
     - ✓ Taking advantage of market inefficiencies;
     - ✓ Working against disadvantageous government policies;
     - ✓ Technology transfer to new market;
     - ✓ Product differentiation;
     - ✓ Provide support to existing multinational clients

Bootstrapping Earnings

- **Bootstrapping** is a way of packaging the combined earnings from two companies after a merger so that merger generates an increase in the EPS of the acquirer, even when no real economic gains have been achieved.
- The "**bootstrap effect**" occurs when a high P/E firm (high growth prospects) acquires a low P/E firm (low growth prospects) in a stock transaction.
- The valuation multiplier would be based on the acquiring firm, the higher P/E. That results the total market value post to the acquisition is larger than the total market value of the acquiring and acquired firms prior to the acquisition.
- In practice, the market tends to recognize the bootstrapping effect and post-merger P/E's adjust accordingly. The post-merger P/E should adjust to the weighted average of the two companies' contributions to the post-merger company's total earnings.

Example: Bootstrapping

- Fastgro is planning to acquire Slowgro in a merger transaction. Calculate Fastgro's post-merger EPS and determine whether the merger created economic gains.

	Fastgro, Inc.	*Slowgro, Inc.*	*Fastgro—Post Merger*
Stock Price	$80.00	$40.00	$80.00
EPS	$3.00	$2.00	
P/E Ratio	26.7	20	
Total shares outstanding	200,000	100,000	250,000
Total earnings	$600,000	$200,000	$800,000
Market capitalization	$16,000,000	$4,000,000	$20,000,000

- **Answer:**
- Given Fastgro's stock price of $80, it can issue 50,000 new shares and use the proceeds to buy Slowgro ($4,000,000 / $80 = 50,000 shares). The total shares outstanding for the post-merger Fastgro will be 250,000. So we compute Fastgro's post-merger EPS as $3.20, which is $0.20 higher than Fastgro would have reported before the merger.

Example: Bootstrapping

- **Answer (cont'd):**
  - However, no economic value was created by the merger because the market capitalization of Fastgro post-merger is equal to the sum of the two companies' values prior to the merger ($16 + $4 = $20 million).
  - Fastgro's post-merger EPS is $3.20, while its P/E is 26.7, thus stock price will be $85.44, which is $5.44 higher than its original price.
  - The apparent growth in EPS through bootstrapping was not the result of growth in earnings through capital investment, increased corporate efficiency, or synergistic gains, but rather from the accounting involved in a stock merger with a low-growth firm.
  - In an efficient market, the post-merger P/E should adjust to the weighted average of the two companies' contributions to the post-merger company's total earnings(以total earnings的权重计算). In our example, this would mean that the post-merger P/E would be about 26.7 * 600,000 / 800,000 + 20 * 200,000 / 800,000 = 25, which would imply that Fastgro's stock price would remain at $80 after the merger.

The industry life cycle and merger motivations

Life cycle	Industry characteristics	Motivations	Types of mergers
Pioneering development	• Substantial development cost; • Low, slowly increasing sales growth	• Sell to larger and mature company; • Young firms merge to pool resources	• Conglomerate, • Horizontal
Rapid accelerating growth	• High profit margins caused by few participants in the market	• Large capital required to expand capacity to grow	• Conglomerate, • Horizontal
Mature growth	• Drop in the entry of new competition, • still have growth potential	• To achieve economies of scale/synergies, and operational efficiencies	• Vertical, • Horizontal

The industry life cycle and merger motivations

Life cycle	Industry characteristics	Motivations	Types of mergers
Stabilization and market mature	• Increasing competition; • capacity constraints	• Economies of scale to match the low cost and price performance of other companies • Large firms acquire small firms to improve management and reach a broader financial base	• Horizontal
Deceleration and decline	• Over capacity, • Eroding profit margin	• Horizontal merger to survive; • Vertical to increase efficiency and profit margin; • Firms in related industries merge to exploit synergy • May acquirer target in young industry	• Conglomerate, • Horizontal • Vertical

Form of acquisition

➢ **Form of acquisition**

- Stock purchase
  - ✓ It occurs when the acquirer gives the target 's shareholders some combination of cash and securities in exchange for shares of the target company's stock.
  - ✓ Shareholders receive compensation, not the company, and must approve the transaction with at least a majority vote.
  - ✓ Shareholders must pay tax on gains, but there are no taxes at the corporate level. If the target company has accumulated tax losses, a stock purchase benefits the shareholders.
  - ✓ The acquirer assume the target company's liabilities.

Form of acquisition

- Asset purchase
  - ✓ When the assets > 50% of the company, shareholder approval is required.
  - ✓ Advantage:
    - ◆Conducted more quickly and easily than a stock purchase because shareholder approval is not required unless a substantial proportion of the assets are being sold.
    - ◆acquirer can focus on buying the parts of a company of particular interest
  - ✓ Payment is made to the company, no direct tax for shareholder. Target company will pay any capital gain taxes.
  - ✓ Acquirer not assume any of the target company's liabilities. But sole purpose of avoiding the assumption of liabilities is not allowed from a legal standpoint.

Key differences between forms of acquisition

Major Differences of Stock versus Asset Purchases		
	Stock purchase	**Asset purchase**
Payment	• Made directly to target company shareholders in exchange for their shares	• Made directly to target company
Approval	• Majority shareholder approval required	• No shareholder approval needed unless asset sale is substantial
Tax: corporate	• No corporate level tax	• Target company pays capital gains taxes
Tax: shareholder	• Shareholders of target pay capital gain tax	• No direct tax consequence for target company's shareholders
Liabilities of target	• Acquirers assumes liabilities of target	• Acquirer usually avoids assumption of target's liability

Method of payment

- **Method of payment:**
  A securities offering, a cash offering, and combination of the two.
  - **In a securities offering**, the target shareholders receive shares of the acquirer's common stock in exchange for their shares in the target company.
  - **In a cash offering,** the acquirer simply pays an agreed upon amount of cash for the target company's share.
- **Exchange ratio**
  - Definition: number of shares that stockholders in the target company receive in exchange for each of their shares in the target company.
  - Because share prices are constantly fluctuating, exchange ratios are typically negotiated in advance for a range of stock prices.
  - The acquirer's cost is the product of the exchange ratio, the number of outstanding shares of the target company, and the value of the stock given to target shareholders.

Method of payment

- **3 main factors to be considered when deciding payment method:**
  1. Distribution of risk and reward between the acquirer and target shareholders.
     - ✓ If acquirer is confident in completing the merger and in the value to be created by the merger, inclined to negotiate for a cash offering rather than a stock offering.
  2. Relative valuations of companies involved
     - ✓ When an acquirer's shares are considered overvalued relative to the target's shares, stock financing is more appropriate.
     - ✓ stock offerings interpreted as overvaluation of acquirer's shares
  3. Changes in capital structure.
     - ✓ borrowing to raise funds for a cash offering increases the acquirer's financial leverage and risk.
     - ✓ issuing new common shares for a stock offering can dilute the ownership interests of existing shareholders.

Mind-Set of Target Management

- **Attitude of target management:**
  - **Friendly merger** offers usually begin with the acquirer directly approaching the target's management.
    - ✓ Once the negotiation and due diligence process is complete, attorneys draft a definitive merger agreement that outlines the terms of the transaction and the rights of each party.
    - ✓ Only when each parry signs the definitive merger agreement is the transaction announced to the public.
    - ✓ Announcement is accompanied by an endorsement of the merger from the target's management and BOD to encourage target shareholders to vote for the deal. The target company's shareholders are then given a proxy statement that outlines all of the pertinent facts of the transaction.
    - ✓ After approval by shareholders and regulators, payment is made, the deal is complete.

Mind-Set of Target Management

- **Attitude of target management:**
  - **Hostile merger offers:**
    - ✓ **Bear hug**: In a hostile merger, which is a merger that is opposed by the target company's management, the acquirer may decide to circumvent the target management's objections by submitting a merger proposal directly to the target company's BOD and bypassing the CEO.
    - ✓ **If the bear hug is unsuccessful**, the next step is to appeal directly to the target's shareholders using one of two methods:
      - ◆ **Tender offer**: The acquirer offers to buy the shares directly from the target shareholders, and each individual shareholder either accepts or rejects the offer.
      - ◆ **Proxy battle**: The acquirer seeks to control the target by having shareholders approve a new "acquirer approved" BOD.

Takeover defense mechanisms

- **When a target is faced with a hostile tender offer (takeover) attempt, the target managers and board of directors face a choice:**
  - Sell the company to hostile bidder or third party; or
  - Attempt to remain independent;
- **If the mangers and BOD decided to keep independent, a series of defense actions will be taken to protect from taking over.**
- **A target might use defensive measures to delay, negotiate a better deal for shareholders, or attempt to keep the company independent.**
  - Pre-Offer Takeover Defense
    - ✓ Two broad varieties are rights-based defenses, such as poison pills and poison puts, and a variety of changes to the corporate charter that are sometimes collectively referred to as **shark repellents**.
  - Post-Offer Takeover Defense
    - ✓ Typically used in conjunction with pre-offer defenses.

Takeover defense mechanisms

- **Pre-offer defense mechanisms**
  1) poison pill
     - ✓ **Flip-in pill**: the shareholders of target have right to buy its shares at a discount; (most effective)
     - ✓ **Flip-over pill**: the shareholders of target have right to buy the acquirer's shares at a discount;
     - ✓ **Dead hand provision**: allows the board of the target to redeem or cancel the poison pill only by a vote of the continuing directors. This makes it harder to take over a target without prior board approval.
  2) poison put
     - ✓ It gives rights to the bondholders of the target;
     - ✓ In the event of takeover, it allows bondholders to put the bonds to the target;
     - ✓ Increase the need for cash and raises the cost of acquisition.

Takeover defense mechanisms

  3) states with restrictive takeover laws
     - ✓ Companies that want to avoid a potential hostile merger offer may seek to reincorporate in a state that has enacted strict anti-takeover laws.
  4) staggered board
     - ✓ Only a part of board of directors are due to election each year;
     - ✓ It delays the control of boards by acquiring company due to freeze of election of most of board members in the coming future.

Takeover defense mechanisms

  5) restricted voting rights
     - ✓ Restricts stockholders who have recently acquired large blocks of stock from voting their shares;
     - ✓ The possibility of owning a controlling position in the target without being able to vote the shares serves as deterrent.
  6) supermajority voting provision for mergers
     - ✓ Requires shareholder support in excess of a simple majority. E.g. 66.7%, 75%, or 80% of votes in favor of a merger.
  7) fair price amendment
     - ✓ A term in corporate charter and bylaws that disallow mergers for which the offer is below a certain threshold.
  8) golden parachutes
     - ✓ Allows the senior management of the target to receive lucrative payouts if they leave the target following a change in corporate control.
     - ✓ Encourage key executives to stay with the target as the takeover progresses and the target explores to generate shareholder value.

Takeover defense mechanisms

- **Post-offer defense mechanisms**
  1) "just say no" defense
     - ✓ If the acquirer attempts a bear hug or tender offer, then target management lobbies the BOD and shareholders to decline and build a case for why the offer is not in the shareholders' best interests.
  2) Litigation
     - ✓ File a lawsuit against the acquirer based on alleged violation of securities or antitrust law.
  3) Greenmail
     - ✓ An agreement that allows the target to repurchase its own shares back from the acquiring company at a premium to the market price.

Takeover defense mechanisms

4) share repurchase
   - ✓ submit a tender offer for its own shares. This forces the acquirer to raise its bid and also increases the use of leverage in the target's capital structure, which can make the target a less attractive takeover candidate.
5) leveraged recapitalization
   - ✓ Repurchase of shares with assumption of a large amount of debt.
6) crown jewel defense
   - ✓ Target sells off assets to party upon announcement of taking-over.
   - ✓ This part of assets to be sold might be significant;
   - ✓ It makes target unattractive to acquiring company.

Takeover defense mechanisms

7) Pac-man defense
   - ✓ Offer to acquire the acquiring company.
8) White knight defense (overpay of winner, winner's curse)
   - ✓ The target company to seek a third party to acquire the target;
   - ✓ It may increase the biding price if the white knight appears;
9) White squire defense
   - ✓ The target seeks a friendly-party to buy a substantial minority stake the target;
   - ✓ It will block the hostile takeover without selling the entire company. (high litigation risk due to direct buying from target but no compensation for target's shareholders)

Antitrust law and HHI

- **US antitrust legislation**
  1) 1890: The Sherman Antitrust Act (monopolize is illegal)
  2) 1914: The Clayton Antitrust Act (detail the business practice)
  3) 1950: The Celler-Kefauver Act (acquisition of asset, conglomerate not just previous shares acquisition, horizontal)
  4) 1976: The Hart-Scott-Rodino Antitrust Improvements Act (required to be review an approve in advance)

Antitrust law and HHI

- The HHI is calculated as the sum of the squared market shares for all firms within an industry.

$$HHI = \sum_{i=1}^{n} (MS_i \times 100)^2$$

MS_i = market share of firm i

n = number of firms in the industry

- HHI concentration level and likelihood of antitrust action

Post-merger HHI	Concentration	Change in HHI	Government action
HHI < 1	Not concentrated	Any amount	No action
1 <HHI<1,800	Moderately concentrated	100 or more	Possible challenge
HHI > 1,800	Highly concentrated	50 or more	Challenge

Valuing a target company

- **The three basic methods that analysts use to value target companies in an M&A transaction are**
  1. discounted cash flow analysis
  2. comparable company analysis
  3. comparable transaction analysis

Discounted cash flow analysis

- **Discounted cash flow analysis**: similar to the free cash flow to the firm (FCFF) approach.
  1. Determine which FCF model to use for the analysis.
  2. Develop pro forma financial estimates.
  3. Calculate FCF using the pro forma data.
  4. Discount FCF back to the present at the appropriate rate. ($WACC_{adjusted}$)
  5. Determine the terminal value and discount it back to the present.
  6. Add the discounted FCF values for the first stage and the terminal value to determine the value of the target firm.

Discounted cash flow analysis

- **Discounted cash flow analysis**: similar to the free cash flow to the firm (FCFF) approach.

Net income	
+Net interest after tax	=unleveled Net income
±change in deferred taxes	
=Net operating profit less adjusted taxes(NOPLAT)	
+Net noncash charges	
±Change in net working capital	
-Capital expenditures(capex)	
=Free cash flow(FCF)	

Distinguish between NOPAT and NOPLAT

Discounted cash flow analysis

- **Discounted cash flow analysis – several concerns**
  - Terminal value can be reached by:
    - ✓ Perpetuity growth from a certain years' estimate, like Gordon growth model

$$\text{Terminal value}_T = \frac{FCF_T(1+g)}{(WACC_{adjusted} - g)}$$

    - ✓ Use multiplier that the analyst believes that the firm will trade at the end of the first stage

$$\text{Terminal value}_T = FCF_T * (P/FCF)$$

  - Discount rate
    - ✓ The discount rate is adjusted WACC to reflect the risk of the target

Summary: Discounted cash flow analysis

- **Summary: Discounted cash flow analysis**
  - Advantages
    - ✓ easy to model any changes;
    - ✓ Based on forecasts of fundamental conditions in the future rather than on current date
    - ✓ The model is easy to customize
  - Disadvantages
    - ✓ Model is difficult to apply when FCF is negative;
    - ✓ Estimates of cash flows and earnings are subject to error;
    - ✓ Discount rate changes over time;
    - ✓ Estimation is a major concern.

Comparable company analysis

- **Comparable company analysis:** uses relative valuation metrics for similar firms to estimate market value, and then adds a takeover premium to determine a "fair price" for the acquirer to pay for the target.
  1) Identify the set of comparable firms.
  2) Calculate various relative value measures based on the current market prices of companies in the sample. Multiples such as P/E, P/B, P/S.
  3) Calculate descriptive statistics for the relative value metrics and apply those measures to the target firm.
     - ✓ The estimated stock value of the target is a mean of value estimated with various multiples;

Comparable company analysis

- **Comparable company analysis: (cont'd)**
  4) Estimate a **takeover premium**.

$$PRM = \frac{DP - SP}{SP}$$

  - ✓ PRM = takeover premium
  - ✓ DP = deal price per share
  - ✓ SP = target company's stock price

  5) Calculate the estimated takeover price for the target as the sum of estimated stock value based on comparables and the takeover premium.
     - ✓ **Target's takeover price** = $\text{estimated stock value} \times (1 + \text{PRM})$

Comparable company analysis

- **Step 1:** Identify the set of comparable firms

Valuation variables	Company1	Company2	company3
•Current stock price	20	32	16
•Earnings per share	1.00	1.82	0.93
•Cash flows per share	2.55	3.90	2.25
•Book value per share	6.87	12.80	5.35
•Sales per share	12.62	18.82	7.62

Comparable company analysis

- **Step 2:** Calculate various relative value measures based on the current market prices of companies in the sample.

Valuation ratio	Company1	Company2	company3	Mean
P/E	20.00	17.58	17.20	18.26
P/CF	7.84	8.21	7.11	7.72
P/BV	2.91	2.50	2.99	2.80
P/S	1.58	1.70	2.10	1.79

Comparable company analysis

- **Step 3:** Calculate descriptive statistics for the relative value metrics and apply those measures to the target firm.

Target company Valuation variables	Target company a	Comparable companies' valuation variable	Mean b	Estimated stock value based on comparables a*b
Earnings per share	1.95	P/E	18.26	35.61
Cash flows per share	4.12	P/CF	7.72	31.81
Book value per share	12.15	P/BV	2.80	34.02
Sales per share	18.11	P/S	1.79	32.42
Estimated stock value			Mean	33.47

Comparable company analysis

- **Step 4** takeover premium
  - PRM = takeover premium $PRM = \frac{DP - SP}{SP}$
  - DP = deal price per share (Takeover price)
  - SP = target company's stock price prior to take over

Target company	Stock price prior to takeover	Take over price	Take over premium
V	23.00	28.50	23.9%
W	17.25	22.65	31.3%
X	86.75	102.00	17.6%
Y	45.00	43.75	19.4%
Z	36.75	45.00	22.4%
Mean premium			**22.9%**

Comparable company analysis

- **Step 5** Target's takeover price = $\text{estimated stock value} \times (1+\text{PRM})$
  - Target's estimated stock value (Step 4) $33.47
  - Estimated take over premium (Step 5) 22.9%
  - Estimated takeover price of target $33.47x1.229 = $41.14

Summary: Comparable company analysis

- **Summary: Comparable company analysis**
  - Advantages:
    - ✓ data is easy to access
    - ✓ Assumption that similar asset has similar value is fundamentally sound
    - ✓ Estimates derived directly from the market, rather than from assumptions and estimates about the future.
  - Disadvantages
    - ✓ the approach assumes the market's valuation is accurate
    - ✓ An appropriate takeover premium must be determined.
    - ✓ Synergies and capital structures are difficult to analyze
    - ✓ The takeover premium may not be timely.

Comparable transaction approach

- **Comparable transaction analysis** use details from recent takeover transactions of similar companies to estimate the target's takeover value. The methodology is very similar to the comparable company approach except that all of the comparables are firms that have recently been taken over.
  1) identify a set of recent takeover transactions
  2) Calculate various relative value measures based on completed deal prices for the companies in the sample.
     - ✓ The price used in calculating in the comparable multiples is the **takeover price** not the stock price prior transaction.
  3) Calculate descriptive statistics for the relative value metrics and apply those measures to the target firm.
     - ✓ The estimated takeover price is the mean of value estimated with various multiples.

Comparable transaction approach

- **Step 1:** Identify a set of recent takeover transactions

Valuation variables	Acquired Company1	Acquired Company2	Acquired company3
Current stock price	35.00	16.50	87.00
Earnings per share	2.12	0.89	4.37
Cash flows per share	3.06	1.98	7.95
Book value per share	9.62	4.90	21.62
Sales per share	15.26	7.61	32.66

Comparable transaction approach

- **Step 2:** Calculate various relative value measures based on completed deal prices for the companies in the sample.

Valuation ratio	Acquired Company1	Acquired Company2	Acquired company3	Mean
P/E	16.5	18.5	19.9	**18.3**
P/CF	11.4	8.3	10.9	**10.2**
P/BV	3.6	3.4	4.0	**3.7**
P/S	2.3	2.2	2.7	**2.4**

Takeover price has included premium

Comparable transaction approach

- **Step 3:** Calculate descriptive statistics for the relative value metrics and apply those measures to the target firm.

Target company Valuation variables	Target company a	Comparable companies' valuation variable	Mean b	Estimated stock value based on comparables axb=c	Weight d	Weighted estimated cxd
Earnings per share	2.62	P/E	18.3	47.95	**20%**	9.59
Cash flows per share	4.33	P/CF	10.2	44.17	**40%**	17.67
Book value per share	12.65	P/BV	3.7	46.81	**20%**	9.36
Sales per share	22.98	P/S	2.4	55.15	**20%**	11.03
Estimated stock value					**Mean**	**47.65**

price

Comparable transaction analysis

- **Summary: Comparable Transaction Approach**
  - Advantages:
    - ✓ no need to estimate a takeover premium
    - ✓ Estimates derive directly from recent prices for actual deals completed in marketplace ;
    - ✓ Low lawsuit risk against target's managers and BOD by shareholders.
  - Disadvantages:
    - ✓ Assumes the market valued the past transactions accurately
    - ✓ There may not be enough comparable transactions;
    - ✓ Difficult to incorporate merger synergies or changing capital structures into analysis

Evaluating a merger bid

- **Post-Merger Value of an Acquirer**

$V_{AT} = V_A + V_T + S - C$

V_{AT} = post-merger value of the combined company (acquirer and target)

V_A = pre-merger value of acquirer

V_T = pre-merger value of target

S = synergies created by themerger

C = cash paid to target shareholders

- **Gains Accrued to the Target**

$Gain_T = TP = P_T - V_T$

$Gain_T$ = gains accrued to target shareholders

TP = takeover premium

P_T = price paid for target

V_T = pre-merger value of target

Evaluating a merger bid

- **Gains Accrued to the Acquirer**

$$Gain_A = S - TP = S - (P_T - V_T)$$

$$Gain_A = \text{gains accrued to the acquirer shareholders}$$

- **Cash payment versus stock payment:** The gain of cash payment is capped. With a stock offer, the gains will be determined in part by the value of the combined firm. For a stock deal we must adjust our formula for the price of the target.

$$P_T = N \times P_{AT}$$

N = number of new shares the target receives.

P_{AT} = price per share of combined firm after the merger announcement

Effects of price and payment method

- **Effect of price:** acquirer will want to pay the lowest while the target wants to receive the highest.
- **Effect of payment method:**
  - **Cash offer:** the acquirer assumes all the risk and receives all potential reward from merger, confident in synergies
  - **Stock offer:** some of the risks and potential rewards from the merger shift to the target firm.
  - The main factor that affects the method of payment decision is confidence in the estimate of merger synergies. The more confident both parties are that synergies will be realized, the more the acquirer will prefer to pay cash and the more the target will prefer to receive stock.

Example: Evaluating a merger bid

- G and K are negotiating a friendly acquisition of K by G. The management teams at both companies have tentatively agreed upon a transaction value of about $27 per share for K's stock, but are presently negotiating alternative methods of payment.

	G	*K*
Pre-merger stock price	$36	$24
Number of shares outstanding (millions)	50	24
Pre-merger market value (millions)	$1,800	$576
Estimated NPV of cost reduction synergies	$120 million	

- Calculate the post-merger value of the combined firm, gains accrued to the target, and gains accrued to the acquirer under the following scenarios:
  - Case 1: Cash offer of $27 per share for K's stock.
  - Case 2: Stock offer of 0.75 shares of G stock per share of K.

Example: Evaluating a merger bid

- **Answer to Case 1 — Cash Offer:**
- A cash offer is the method of payment that is most straight-forward and easiest to evaluate.
  - Post merger value of the combined firm: $V_{AT} = V_A + V_T + S - C$
  - V_A = \$1,800
  - V_T = \$576 as
  - S = \$120
  - C = cash price offered x number of shares = \$27 x 24 = \$648
- The value of the combined firm is VAT = \$1,800 + \$576 + \$120 - \$648 = \$1,848.
- Gain to target: K's gain in the merger as the target = $Gain_T = TP = P_T - V_T$ = \$648 - \$576 = \$72. This represents the takeover premium in the transaction.
- Gain to acquirer: Giant Foods' gain in the merger as the acquirer = $P_T = S - (P_T - V_T)$ = \$120 - (\$648 - \$576) = \$48. This equals the value of synergies in the deal less the takeover premium paid to K's shareholders.

Example: Evaluating a merger bid

- **Answer to Case 2 – stock offer**
- A stock offer is much more complex and more difficult to evaluate. In this case, the stock offer of 0.75 shares for each share of K's is equal to (0.75 x \$36) = \$27, so it appears to be equivalent to the cash offer. However, the results are different because there is dilution when G issues new stock to K's shareholders.
- Since there are 24 million shares of K's outstanding, G must issue 24 million x 0.75 = 18 million new shares.
- Post merger value of the combined firm: $V_{AT} = V_A + V_T + S - C$
  - V_A = \$1,800
  - V_T = \$576
  - S = \$120
  - C = \$0 because no cash is changing hands
  - The value of the combined firm is VAT = \$1,800 + \$576 + \$120 - 0 = \$2,496.

Example: Evaluating a merger bid

- **Answer to Case 2 – stock offer**
- Gain to target: To account for the dilution and find the price per share for the combined firm, PAT, divide the post-merger value by the post-merger number of shares outstanding. Since 18 million new shares were issued, the total shares outstanding for G is (50 + 18) = 68 million.
- This means the actual value of each share given to K's shareholders is \$36.70, and the actual price paid for the target is:
  - $P_T = (N \times P_{AT})$ = (18 x \$36.70) = \$660.60
  - K's gain in the merger as the target is:
  - $Gain_T = TP = P_T - V_T$ = \$660.60 - \$576 = \$84.60
  - This represents the takeover premium in the transaction.
  - Gain to acquirer: G's gain in the merger as the acquirer is:
  - $Gain_A = S - TP = S - (P_T - V_T)$ = \$120 - (\$660.60 - \$576) = \$35.4 million

Example: Evaluating a merger bid

- This equals the value of synergies in the deal less the takeover premium paid to K's shareholders.
- The examples show that the gain to G's shareholders was $48 million in the all cash deal, but only $35.4 million in the stock deal. The dilution from the stock offer effectively reduced the acquirer's gains because the target was able to share in the risk and reward of the deal as a result of receiving shares.

Who benefits from merger?

- **Distribution of merger benefits: empirical evidence related to the distribution of benefits in a merger.**
  - **Short-term** performance studies show:
    - ✓ target shareholders reap 30% premiums over the stock's pre-announcement market price, and the acquirer's stock price falls between 1 and 3%;
    - ✓ on average, both the acquirer and target tend to see higher stock returns surrounding cash offers than around share offers.
    - ✓ The high average premiums paid to target shareholders may be attributed to the winner's curse.
    - ✓ Hubris of acquirers' mgt by overestimating synergies. Even if no synergies from a merger, managerial hubris would still lead to higher-than-market bids and a transfer of wealth from the acquirer's shareholders to the target's shareholders
  - **Longer term** performance studies show
    - ✓ that acquirers tend to underperform their peers
    - ✓ a general post-merger operational failure to capture synergies;

Who benefits from merger?

- Some mergers do enhance value for the acquirer. The following are characteristics of M&A deals that create value:
  - **Strong buyer**: Acquirers that have exhibited strong performance (in terms of earnings and stock price growth) in the prior three years.
  - **Low premium**: The acquirer pays a low takeover premium.
  - **Few bidders**: The lower the number of bidders, the greater the acquirer's future returns.
  - **Favorable market reaction**: Positive market price reaction to the acquisition announcement is a favorable indicator for the acquirer.

Corporate restructuring

- **Divestitures**
  1) Equity carve-outs, creating a new legal entity and sales of equity in it to outsiders;
  2) Spin-offs, parent company shareholders receive a proportional number of shares in a new, separate entity; Whereas the sale of a division results in an inflow of cash to the parent company, a spin-off does not.
  3) Split-offs, some of shareholders of parent company are given shares in new entity in exchange for shares of the parent company.
  4) Liquidations, break up the firm and sell off its asset piece by piece, which is associated with bankruptcy.

Corporate restructuring

- Previous mergers that did not work out as planned are not the only reason companies may choose to divest assets
- **Some of the common reasons for restructuring:**
  1) Change in strategic focus, division no longer fits into management's long-term strategy
  2) Poor fit (low profit)
  3) Reverse synergy, individual parts are worth more than the whole
     - ✓ Managers may feel that a segment of the company is undervalued by the market because of poor performance.
     - ✓ It is possible that the division and the company will be worth more separately than combined.
  4) Financial or CF needs, selling a division can create a significant cash flow for the parent company and reduce debt.

It's not the end but just beginning.

If you have people you love, allow them to be free beings. Give and don't expect. Advise, but don't order. Ask, but never demand. It might sound simple, but it is a lesson that may take a lifetime to truly practice. It is the secret to true Love. To truly practice it, you must sincerely feel no expectations from those who you love, and yet an unconditional caring.

如果你有爱的人，允许他们自由随意的存在。给予而不指望；建议而不命令；请求而不要求；可能听起来简单，但这需要一辈子去实践。这就是真爱的秘诀。真正去实践它，你必须对那些你爱的人没有期望，并给予无条件的关爱。