

Inventories, Long-lived Assets, Income Taxes, and Non-current Liabilities

Cost Measurement

Historical	Current		
Buy	Buy	Sell	Use
Historical cost (originally paid)	Current cost (pay today for the same asset)	Fair value (sell price)	Value In Use (present value of future cash flow)
Amortized cost (HC – depreciation / amortization - impairment)		Net realizable value (fair value – selling cost)	
AC = Carrying value / book value		Recoverable Amount: max (NRV, VIU)	

Asset Life

- Recognition 确认
- Depreciation 折旧 (有形资产)
- Amortization 摊销 (无形资产)
- Impairment 减值 (所有资产, 但是无形无限期资产只能减值)
- Revaluation 重新估值
- Derecognition 终止确认
 - Sold, exchange, abandon

Valuation Models

- **Cost model**
 - historical cost – depreciation/amortization - impairment
- **revaluation model (IFRS)**
 - gain as surplus in equity
- **fair value model (IFRS)**
 - gain in the income statement
 - investment property (earn rental or capital appreciation)

资产目的

- 使用
- 投资
 - Investment properties
- 销售
 - Sale
- 交换
 - Exchange
- 融资租赁
 - lease

重要资产

- PP&E
- 采购
- 投资
- 租赁

Asset

- **Tangible**
 - **Depreciation**
 - Systematic allocation of an asset's cost over time
- **Intangible**
 - **Amortization**
 - **impairment**

费用化和资本化

- 费用化是一次性支出，资本化是为了平滑成本的多次支出
- 支出是通过折旧或者均摊
- 减值是损失或者盈利
- 不可资本化
 - The costs related to the **preferred** shares (dividend) cannot be capitalized.
- 常见资本化
 - Construction loan
 - Construction **interest** (not dividend)
 - Intangible (purchased, merged: goodwill)

Capitalizing or Expensing

- Expenses can be **expensed** as they are incurred, or they can be **capitalized**.
- Expense on the **income statement** or capitalize it on the **balance sheet** as an **asset**.
- Under IFRS, any amounts earned by **temporarily** investing the funds are deducted from the capitalized amount.
- **Capitalizing or Expensing Rule**
 - **Capitalize** it if it provides a future **economic benefit** over **multiple** accounting periods. If future benefit is **unlikely** or **highly uncertain**, should be **expensed**.
 - Once an asset is capitalized, subsequent related expenditures that provides more future economic benefits (rebuild the asset) are also **capitalized**. Subsequent expenditures that merely **sustain** the usefulness of the asset (maintenance) are **expensed** when occurred.
- **Expensing Process**
 - **Expense** in the income statement and deducted it from pre-tax income.
- **Capitalizing Process**
 - **Balance Sheet**
 - Initially recorded as an **asset** on the balance sheet at **cost**, which is the **fair** value plus any **costs** necessary to prepare the asset for **use**.
 - **Income Statement**
 - Except for **land** and intangible assets with **indefinite** lives (i.e., goodwill), cost is allocated to the **income** statement over the life of

the asset as **depreciation** expense (tangible) or **amortization** expense (intangible with finite lives)

- **Cash flow**
 - **Investing Cash flow** 投资现金流

Expensing vs Capitalizing

Statement	Expensing	Capitalizing
Balance Sheet	NO	Asset Fair value + setup fee
Income Statement	Expense	Accumulated Depreciation
Cash flow	Operating	Investing
Equity		

Interest - Capitalized Interest or Interest Expense

- 和费用的资本化类似，利息是资产不可或缺的部分。
- IFRS & GAAP
 - Some interest is **capitalized** as part of the **asset cost** to better match the cost with revenues generated by the asset.
- Capitalized interest condition
 - Construct an **asset** for **own use** or **resale** 自用或者销售
 - during the construction period 建造期间的利息
- Income Statement
 - Capitalized interest is not reported as an **interest expense**.
 - held for use: **depreciation expense**
 - held for sale: **COGS**
- Cash Flow Statement
 - Capitalized interest -> **investing**
 - Interest expense -> **operating**
 - IFRS: interest expense can be either CFO (**operating**) or CFF (**financing**)

The expensing of the previously capitalized interest is a non-cash amount and does not affect cash flow from operations. Under US GAAP, cash flow from operations is higher as a result of the initial capitalizing of interest but not its **subsequent** expensing. If the interest had not been capitalized, interest expense would have been greater and net income and cash from operations lower.

Capitalized or Expensed Interest

Statement	Expensing	Capitalizing
Balance Sheet		
Income Statement	Interest Expense	Held for use: Depreciation expense Held for sale: COGS
Cash flow	Operating	GAAP: Investing IFRS: Operating or Financing

Intangible – Useful Life

- **Finite life - Amortization**
 - amortization
- **indefinite life - Impairment**
 - not amortized, but test for **impairment** at least annually.
 - If impaired, the reduction in value is recognized in the **income statement** as a loss in the period.
 - The **trademark** can be renewed at a minimal cost, so it is considered to have an indefinite life and amortization expense is not required.

Intangible - Identifiable - IFRS

- **Identifiable**
 - Expected to provide future economic benefits
 - The benefits must be probable, and the asset's costs must be **reliably** measurable.
 - Capable of being **separated** from the firm or arise from a contractual or legal right
 - Controlled by the firm
- **Unidentifiable**
 - Cannot be purchased **separately** and may have an **indefinite** life.
 - Most common example is **goodwill**

Intangible – Creation

- **Internally Created – Mostly Expensed**
 - Most costs are **expensed**.
 - Exception: research and development cost, software development cost.
 - IFRS
 - Research costs -> expensed
 - development cost can be **capitalized**
 - if can complete the asset, intend to use or sell it
 - GAAP
 - Research cost -> **expensed**
 - Development cost -> **expensed**
 - **Software development** -> similar to R&D in IFRS
 - **expensed** it
 - **technological feasibility** has been established -> **capitalized**
- **Purchased – Capitalized**
 - Balance sheet: Initially recorded at its fair value at acquisition.
 - If purchased as part of a group, they are allocated to each asset.
- **Business Combination - Capitalized**
 - **Acquisition** method is used.
 - The purchase price is allocated to the **identifiable** assets and liabilities.
 - Any **remaining** amount of the purchase price is recorded as **goodwill**.
 - Only goodwill in a business combination is capitalized, the rest are expensed.

Intangible - Classification

Intangible		Expensing or Capitalizing	
Level1	Level2	Expensing	Capitalizing
Life	Finite		YES (amortization, impairment)
	Indefinite	NO	YES (impairment) Trademarks
Separation	Identifiable		
	Unidentifiable		Goodwill
Creation	Internal	YES (most)	Depends
	Purchased	NO	YES
	Merged	Yes (Most)	goodwill

Intangible - Internal Created

Level1	Level2	IFRS	GAAP
Most		Expensed	Expensed
R &D	Research	Expensed	Expensed
	Development	Capitalized (if can complete it and intend to sale it)	Expensed
Software Development For Sale	Initial Stage		Expensed
	Stable (technology feasibility)		Capitalized

Expense & Capitalizing - Effects

- **Balance Sheet**
 - Capitalizing: Assets reported on the balance sheet, **higher** total assets.
- **Net Income**
 - **Timing**
 - Capitalizing an expenditure **delays** the recognition of an expense.
 - Total net income is the **same** whatever they are capitalized or expensed.
 - **Timing** of expense recognition is the only difference.
 - **Variability**
 - Capitalizing costs and depreciating them over time will show a **smoother** pattern of reported incomes.
 - Expensing firms have higher **variability** in reported income.
 - **Profitability**
 - Capitalizes: **higher profit** earlier, **lower** profit later
 - Expense: lower profit earlier, higher profit later
- **Shareholders' Equity**
 - Capitalizing
 - in the earlier stage (**high**)
 - Income -> retained earning -> higher equity
 - In the later stage (lower)
- **Cash Flow**
 - **Classification**

- Capitalizing: **investing** outflow (CFI)
 - Expensing: **operating** outflow (CFO)
- No difference in tax treatment
 - Assume no difference in tax, total cash outflow is the **same**.
 - Classification is the only difference
- Tax
 - Capitalizing: Less expense, high net profits, more tax in the first years
- In subsequent periods
 - **No effect** on cash flow aside from any tax effects
- **Financial Ratios**
 - profitability
 - A company that capitalizes its costs will display higher profitability ratios at the onset and lower ratios in the later stages.
 - Liquidity ratios
 - will experience little impact, except for the CFO ratio, which will be higher under the capitalization method.
 - Operation-efficiency ratios
 - total asset and fixed-asset turnover will be lower under the capitalization method, due to higher reported **fixed** assets.
 - At the onset, equity turnover will be higher under the capitalization method (lower total equity due to lower net profit).
 - Companies that capitalize their costs will initially report higher net income, lower equity and higher total assets. Remember that, on average, an equal dollar effect on a numerator and denominator will produce a higher net result. That said, on average, ROE & ROA will initially be higher for capitalizing firms.
 - Solvency ratios
 - better for firms that capitalize their costs because they have higher assets, EBIT and stockholders' equity.

Impact of Assets, Profitability and financial ratios

Overall	Initially		Later years	
	Capitalizing	Expensing	Capitalizing	Expensing
Net income	Higher	Lower	Lower	Higher
EBIT	Higher	Lower	Lower	Higher
EBITDA	no effect	no effect	no effect	no effect
Stockholder equity	Higher	Lower	Lower	Higher
Total Assets	Higher	Lower	Higher	Lower
CFO	Higher	Lower	Lower	Higher
CFI	Lower	Higher	-	-

Liquidity ratios	Initially		Later years	
	Capitalizing	Expensing	Capitalizing	Expensing
Cash Flow from operation ratios	Higher	Lower	Lower	Higher

Activity ratios	Initially		Later years	
	Capitalizing	Expensing	Capitalizing	Expensing
Total asset turnover	Lower	Higher	Lower	Higher
Fixed asset turnover	Lower	Higher	Lower	Higher

Investment ratios	Initially		Later years	
	Capitalizing	Expensing	Capitalizing	Expensing
ROA	Higher	Lower	Lower	Higher
ROE	Higher	Lower	Lower	Higher

Solvency ratios	Initially		Later years	
	Capitalizing	Expensing	Capitalizing	Expensing
debt to equity	Higher	Lower	-	-
Time interest earned	Higher	Lower	Lower	Higher
CFO to debt	Higher	Lower	Lower	higher

Depreciation – Cost Model 成本法

- Systematic allocation of an asset's cost over time.
- **Historical cost/gross investment 历史成本/毛投资**
 - The original purchase price of the asset including instalment and transportation costs.
- **Carrying (book) value 账面价值**
 - The net value of an asset or liability. 账面净值
 - PPE: book value = historical cost – accumulated depreciation - impairment
 - 历史成本 – 累计折旧 – 减值

Depreciation Methods

- Straight-Line Depreciation
 - Depreciation expense = (original cost – salvage value) / depreciable life
- Accelerated

- Double-declining balance (DDB) 双倍折旧法，均匀折旧的 2 倍。
 - depreciation in year $x = 2/\text{depreciable life} * \text{book value at the beginning of year}$
 - Stops once the carrying value reaches the salvage value.
- Initial value V , $d = 1 - 2/\text{depreciable life}$ is the **discount factor**
 - At the end of the first year, value is $V*d$ 折扣
 - At the end of n -th year, value $V = \max(V*d^n, \text{salvage})$
 - Maximum number of depreciation years
 - Ceiling $\lceil \log_d (\text{Salvage}/\text{Cost}) \rceil$
- Units-of-production method
 - Depreciation = (original cost – salvage value) / life in output * output units in the period

Depreciation Methods (V: original value, S: salvage value, N: number of years)

Method	Depreciation	Note
Straight-Line	$(V-S) * 1/N$	
Double-Decline Balance	$(2/N) * B_i$ if $B_{(i+1)} > S$, $B_i - S$	B_i : book value at the beginning of the i -th year book value \geq salvage value
Units-of-Production	$(V-S) * O_i/O$	O_i : output at the i -th year O : total output

Component Depreciation

- IFRS - **separately**
 - Depreciate the components of an asset separately
 - estimate useful life and residual value for each component
- GAAP - **whole**
 - Component depreciation is allowed but seldom used.
 - Use the **maximum** life

Revaluation Model – IFRS 市值法

- GAAP & IFRS – cost model (depreciated cost) 成本法
- Long-lived asset can be reported at its **fair value**
 - an **active** market exists so it's fair value can be reliably estimated.
 - Must choose the **same** treatment for similar assets (land and building)
 - **Rarely** used in practice
- **Revaluation = Cost Model + Fair Value Adjustment 定期折旧和重新估值**
 - An asset is carried at its **depreciated cost**
 - At evaluation date, it is adjusted to **fair value**
 - Between revaluation dates, **depreciation** is recorded for the asset
 - Must be done sufficient often to match its fair value.
- First Revaluation date
 - Carrying value $>$ fair value
 - IS: a **loss** (like an impairment charge)
 - Carrying value $<$ fair value
 - Equity: revaluation **surplus** (do not affect net income)

- Subsequent revaluation date (record to offset)
 - Carrying value > fair value
 - Equity: reduce **surplus account**
 - IS: Excess loss (loss - surplus) is a **loss**
 - Carrying value < fair value
 - IS: A **gain** to **reverse** any previously recorded loss
 - Equity: excess gain (gain - previously loss) in the **surplus** account

Revaluation Model - IFRS

Time	Condition	Balance Sheet	Income Statement	Equity
Initial		Original Cost		
between			Depreciation	
First Evaluation	Book > Fair	Fair value	Loss	
	Book < Fair			Surplus
Subsequent Evaluation	Book > Fair	Fair Value	2) loss = excess loss	1) reduce surplus
	Book < Fair		1) gain to reverse loss	2) excess gain

Evaluation Models - IFRS & GAAP

Mode	IFRS	GAAP	Book Value
Cost model	YES	YES	Historical cost + Accumulated Depreciation (Income Statement)
Revaluation Model	YES	NO	Historical Cost + Accumulated Depreciation (Income statement) + gain or Loss (Income Statement) + Surplus Account (Equity)
Component Depreciation	Separate	Whole	Separate : different useful life and salvage value

Impairment – Held for Use – Tangible and Finite Intangible 持有**使用**为目的

- Both tangible and intangible with finite lives that are held for use.
- IFRS
 - Event
 - Annually assess whether events or circumstances indicate an impairment has occurred.
 - Significant decline in market value or change in asset physical condition.
 - **Recoverable** amount 用于测试和减值
 - Recoverable amount is based on **own use or held for sale**
 - Recoverable amount = max (NRV, value in use)
 - Net realizable value (NRV) = fair value – selling cost
 - Value in use = PV of future cash flow from continued use
 - **Impairment Test**
 - carrying value < recoverable amount -> impaired
 - **Impaired Loss**
 - impairment loss = carrying value – recoverable amount
 - **Impaired**

- Balance sheet: written to **recoverable** amount
- Income statement: impairment loss is recognized
- **Reversal**
 - An **identifiable** long-lived asset can be reversed if value recovers
 - Loss reversal is limited to the **original** impairment loss.
- **GAAP**
 - future **undiscounted** cash flow 未来现金流的**非折现** 用于测试
 - Recoverability Test 比较保守
 - Carrying value > future **undiscounted** cash flow
 - Considerable management discretion
 - Estimated fair value 用于减值 (**销售或者自用**)
 - **fair value** or **VIU** (**discounted** future cash flow) if fair value is unknown
 - Loss Measurement
 - Carrying value - estimated fair value
 - **Impaired**
 - Balance sheet: written to estimated fair value
 - Income statement: impairment loss is recognized
 - **Reversal – NO**

Impairment – Intangible with Indefinite Lives – Fair Value 无形资产

- Not amortized **不摊销**
- Test for impairment at least annually 减值
- A loss is recognized when the carrying amount > **fair value**

Impairment – Held for Sale – Long-lived Assets – Net Realizable Value 用于销售

- held for use -> held for sale
 - no longer depreciated or amortized **不折旧或者摊销**
 - test for impairment 减值测试
- Impairment Test
 - Carrying value > **net realizable value** (fair value – selling cost)
- Impairment Loss
 - Carrying value -> **net realizable value**
- Reversal - IFRS & GAAP **都可以恢复**
 - Can be reversed if value recovers
 - Limited to original impairment loss

Situation	Purpose		New value	Comment
Tangible And definite intangible	use	IFRS	Max(NRV, VIU)	
		GAAP	Fair value or VIU	Undiscounted VIU 用于测试
Intangible indefinite			Fair value	不折旧摊销
Long-lived	sale		NRU	不折旧摊销

				GAAP 可以 reverse

Impairment – Definition

Item	Definition
Carrying/Book Value	Original Cost – accumulated cost – impairment 账面价值
Fair Value	
Net realizable value (NRV)	Fair value – selling cost 卖掉
Undiscounted Value in use	Undiscounted value of future cash flow
Value in use	Discounted value of future cash flow 自己用
Recoverable amount	Max (net realizable value, value in use) 卖掉或者留着

Impairment – Held for Use - IFRS & GAAP

Item	IFRS	GAAP
Recoverability Test	Carrying value > Recoverable amount	Carrying value > undiscounted future cash flow
Loss Measurement Income Statement	Carrying value – Recoverable amount	Carrying value – fair value or value in use
Loss Measurement Balance Sheet	recoverable amount	Fair value
Reversal	Yes. Carrying value cannot exceed the carrying value before the loss	NO

Impairment – Held for Sale (Both GAAP & IFRS)

Item	Description
Depreciation/Amortization	NO
Recoverability Test	Carrying value > net realizable value
Loss Measurement Income Statement	Carrying value – net realizable value
Loss Measurement Balance Sheet	net realizable value
Reversal	YES. Reversal cannot exceed the original impairment loss. New carrying value cannot exceed the carrying value before the loss was recognized.

Derecognition – PPE & Intangible 终止确认

- When assets are sold, exchanged, abandoned.
 - Remove from balance sheet
- Sold
 - balance sheet: removed the asset
 - Income statement: a gain or loss
 - Gain or loss = sale proceeds – carrying value

- carrying value = original cost – accumulated depreciation – impairment charge
 - Is part of **other** gains and losses, or reported separately if material.
 - cash flow statement 投资
 - Is a **investing** cash flow (CFI)
 - If use direct method, the gain or loss is **removed** from net income to compute CFO (operating)
- Abandoned
 - Similar to a sale, except there are no proceeds.
 - Remove from BS and a loss is recognized in the IS.
- Exchange
 - Balance sheet
 - remove old asset at its carrying value
 - record the new asset at its **fair** value
 - Income statement
 - Gain or loss = old asset carrying value – **old asset fair value** new or **new asset fair value** if its value is clearly more evident.

Derecognition - PPE & Intangible 终止确认

Purpose	Balance Sheet	Income Statement	Cash Flow
Sold	Remove	1 Change: Proceeds – carrying value 2 as other gain or loss	Investing inflow = proceeds
Abandoned	Remove	Loss: carrying value	NO
Exchange	1 Remove Old 2 Record new asset at fair value	Gain or loss = old fair value (or new asset fair value if it more evident) - carrying value	NO

Disclosure - PP&E, Intangible

- IFRS
 - Basic
 - Basis for measurement (historical cost)
 - Useful lives or depreciation rate
 - Gross carrying value and accumulated depreciation
 - **Reconciliation** of carrying amount from beginning to the end of the period
 - Must
 - Title restrictions and assets pledged as **collateral**
 - Agreements to **acquire** PP&E in the future
 - **If revaluation (fair value) model is used**
 - The revaluation **dates**
 - How **fair value** is determined
 - **Carrying value** using the historical cost
 - Intangible assets
 - Similar to PP&E, and whether useful lives are **finite or indefinite**
 - Impaired assets
 - **Circumstances** that caused the impairment loss or reversal

- **Amounts** of impairment losses and reversal by asset class
- Whether losses and reversals are **recognized** in the income statement
- GAAP
 - Basic
 - **Depreciation** expense by period
 - **Balance** of major classes of assets by nature and function, such as land, improvements, buildings, machinery, and furniture
 - **Accumulated** depreciation by major classes or in total
 - General description of depreciation **method** used
 - Intangible
 - Similar to PP&E, estimate **amortization** for the next **five** years
 - Impaired
 - A description of the impaired **asset**
 - **Circumstances** that caused the impairment loss
 - **How fair value was determined**
 - **Amounts** of impairment losses
 - Whether losses are recognized in the income statement

Investment Property - IFRS

- Definition
 - IFRS: own it to collect rental or earning capital appreciation
 - GAAP: no such distinguish
- Cost model
 - Same with PP&E
- **Fair value model**
 - Different from **revaluation** model, **no surplus account**, directly reflect as **gains** in the income statement
- Property change

Transform from	Transform to	Treatment
Owner-occupied	Investment property	Revaluation: recognizes gains if it reverses previously losses
Inventory	Investment property	Recognize gain or loss if fair value is different from carrying amount
Investment property	Owner-occupied or inventory	Fair value of asset at date of transfer will be its cost

Lease

- **Lessor** allow **lessee** to use the asset for periodic payment
- Classification
 - Financial/capital lease and operating lease
- Operating lease - rental expense

- A rental arrangement. No asset or liability is reported
- Periodic Lease payments are **rental expenses** in the income statement
- Operating lease will appear on the BS of **lessees** in 2019
- **Financial lease**
 - Purchase an asset that is financed with debt.
 - Inception
 - Both asset and liability
 - Overtime
 - **Depreciation expense** on the asset
 - **Interest expense** on the liability
- **Financial impact**
 - **Financial lease**
 - Increase debt, decrease early stage income

Reporting by Lessee (Purchase + Finance)

Lease Level 1	Lease Level 2	Balance Sheet	Income Statement	Cash Flow
Operating		NO	Rental expense	CFO: Lease payment
Finance	Lease Value	min (present value of future minimal lease payments, fair value)		
	Interest Expense	Interest expense = beginning liability * interest rate		
	Principle repayment	Principle repayment = lease payment – interest expense of the period		
	Inception	Asset: = Liability: lease payable = lease value		
	Over Time	Asset: Reduce? Liability: Reduce?	Depreciation expense Interest expense 只有利息费，无本金费	CFF: Principle repayment CFO: Interest expense (IFRS: CFF or CFO)

Reporting by Lessor (Sell + Invest)

Lease Level 1	Lease Level 2	Balance Sheet	Income Statement	Cash Flow
	Compute	Asset PV: V, rental income each period: PMT, contract years: N Depreciation Expense: V/N (assume straight-line depreciation) Total Rental income: PMT * N Total interest income: PMT * N – (V/N)*N		
Operating		Asset	Rental Income Depreciation expense	CFO: Lease Income
Finance	Lease Value	Present value of lease payments		

	Interest Income	Interest income = beginning lease receivable * interest rate		
	Principle reduction	Principle reduction = lease income – interest income of the period		
	Inception	Asset: remove asset Asset: add lease receivable = lease value	Revenue: lease value COGS: asset carrying value gross profit=0 for non-manufacture or dealer	
	Over Time	Lease receivable -= principle repayment	Interest Income 只有利息收入，无本金收入	CFI : Principle reduction CFO: Interest income

Lease Integrated

	Party	Time	Balance Sheet	Income Statement	Cash Flow
Operating	Lessee		NO	Rental Expense	CFO: Lease Payment
	Lessor		Asset	Rental income Depreciation expense	CFO: Lease received
Finance	Lessee	Inception	1 Asset 2 lease payable		
	Lessor		Lease receivable	1 Revenue: lease value 2 COGS: carrying value 3 gross profit=0 for non-manufacture or dealer	
	Lessee	Over time	1 Asset 2 Lease payable -= principle paid	Interest expense Depreciation expense	CFF : principle repayment CFO : interest expense (IFRS: CFO or CFF)
	Lessor		Lease receivable -= principle paid	Interest Income / revenue	CFI : principle reduction CFO : interest received