

Financial Accounting: why?

It provides the “numbers” we normally hear about a company (revenues, profit, assets value ...).

It is a fundamental part of company evaluation, i.e. it contributes (together with “expectations”) to determine for example:

- The shares’ price and market capitalization of a company in the day by day trading (financial analysis)

Note: Market capitalization, commonly called market cap, is the market value of a publicly traded company's shares outstanding. Market capitalization is equal to the share price multiplied by the number of shares outstanding. Shares outstanding are all the shares of a corporation that have been authorized, issued and purchased by investors and are held by them. They are distinguished from treasury shares, which are shares held by the corporation itself. Shares outstanding and treasury shares together amount to the number of issued shares.

- The target price in an M&A (due diligence)

Note: A merger occurs when two separate entities combine forces to create a new, joint organization. Meanwhile, an acquisition refers to the takeover of one entity by another. As an aspect of strategic management, M&A allows enterprises to grow or downsize, improve their reputation, diversify their products, and change the nature of their business or competitive position.

M&A in terms of financial data can have strong impact on a company's account because it leads to revaluation of the assets. Therefore, when we are acquiring another company and putting the accounts of company A and B together, we have opportunity to reevaluate the value of the assets bought. In this case, the value of the company is often greater than the book value.

Note: due diligence is an investigation, or review performed to confirm facts or details of a matter under consideration. In the financial world, due diligence requires an examination of financial records before entering into a proposed transaction with another party.

- The selling price of shares in an Initial Public Offering (due diligence)
- The credit stability (rating services)

When a company has a credit rating of A or even B, it means that this company is very stable. Usually a third party company determines the credit rating of an investigated company. It is a procedure that a company decide to go through in order to show to all investors and creditors its ability and performances. The official outcome of credit rating has a direct influence on which type of credit (i.e. bank loan) the company may take. For instance, if the company has high credit rating, the interest rate of loans will be lower or the conditions will be much more favorable.

In order to determine the credit rating of a company, many factors are taken into account. The most important things are financial solidity, cash flow, solvency, liquidity and profitability. In the credit rating process, we do not only assess the status of the company but also we evaluate the industry overall. For example, if your company is doing perfect, but the industry overall is perceived to be in a negative trend, the company's credit rating most likely decrease. It means you most likely will have troubles.

Note: If we would like to invest in a company with credit rating of A or even B, we should know that the change of their share's price between day one and for example six month later would be very low. It means the price will be most likely stable (financial perspective). From accounting perspective, this company is most likely profitable with great accounts and maybe even distribute dividends.

It should be noted there is not 100% correlation between profitability inside the company and the growth in their market share's price. For instance, Tesla has been in red for many years; however, its share's price has significantly grown. Therefore, the profit of investors and the profit of the company are not same. Of course, if the company is doing well, it has a positive impact on the share's price.

Note: liquidity of a company can be determined using both Income statement and cash flow statement.

What is the difference of BS and IS with CFS? The balance sheet and the income statement adopt the accrual logic while the cash logic is adopted in the cash flow statement. The discrepancy between the results from accrual logic and cash logic should not be big.

Accrual Logic versus Cash Logic

If we have a transaction, for example the selling of a product or the purchasing of raw material, we can register this transaction into our financial statement either by using an accrual logic or a cash logic.

Considering cash logic, we are going to register the cash in when the company receives some money. For example, if the company sold products we are going to register a cash in when the company receives the cash. On the opposite, we are going to register a cash out when the company pays the cash. For example, if a company is purchasing raw materials when raw materials are paid, we are registering a cash out. Therefore, by adopting the cash logic, events are registered only when the cash is received or is paid.

Using accrual logic, we are going to register the events when the transaction has its effects. If we are using accrual logic, we do not consider the moment of the payment but we are considering the moment in which the selling product has been transferred from one company to another one, which means that the transaction has its effects. On the opposite, we are going to register an expense when it is associated to a revenue. If we have the revenue, we need to identify the resources that are related to this specific revenue. Only if we have the expense related to that revenue, we can register the expense itself.

Note: The aim of accrual logic is to identify profit. Therefore, if you are using an accrual logic we can find a profit as a difference between revenue and expense while if we are adopting a cash logic, we can identify the net cash of the company as the difference between the cash in and the cash out.

Financial Accounting: how?

Annual report analysis sheds light on certain aspects of the company but at the very end, it is the analyst who has to provide his/her own interpretation.

Remembering that:

- not all the indicators have the same relevance
- indicators pose questions more than providing answers

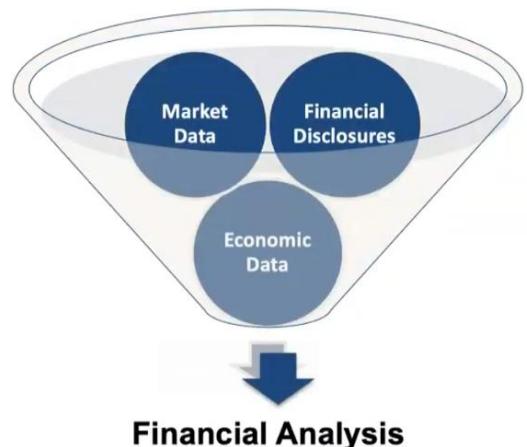
Financial Analysis

Financial analysis is a process of selecting, evaluating, and interpreting financial data, along with other pertinent information, in order to formulate an assessment of a company's present and future financial condition and performance.

Regarding market data, data of specific industry along with data related to specific country or countries (political and legal data), competitors' performance and consumers' data can be taken into consideration.

Financial analysis is more than calculating indicators, but it requires the following:

1. Sources selection and data "triangulation"
2. Segmental analysis
3. Common size analysis
4. Reclassification and adjustments
5. Benchmarking
6. Accounting-based indicators (selection)
7. Interpretation



1. Sources selection and data "triangulation"

- Financial disclosures

- Financial statements schemes

For example, timing differences. The end of the financial year can be represented by 31 December or 31 March (UK). In order to do benchmarking and comparison analysis you have to consider companies with align financial year timing.

- Shareholder letter

In shareholder letter, the company provides information regarding the most important events throughout the year to shareholders. The letter generally covers the firm's basic financial results, changes in the company's stock price, its current position in the market, and some of its plans. It is a chance for the executives of a firm to speak directly to shareholders.

- 2. Segmental analysis

Company's financial performance can be segmented in many ways, including physical location, products or areas of responsibility. Comparing segments of a business helps a company analyze its performance more accurately.

A business may operate in many geographic markets. For example, a retail business may have stores in all four quarters of the country. In that case, it is useful to compare how profitable the stores in the southeast are in comparison to the stores in the northwest. This can reveal the underlying components of profitability and may uncover any chronic problems in certain locations.

A business can be segmented by the various products or services it sells. In an insurance company, it makes sense to separate the life insurance from the health

insurance for reporting purposes. Analyzing individual lines of business can show which products or services are underperforming so they can be revamped or replaced.

Some companies want to analyze the performance of each **department**. This is often done for internal purposes rather than outside financial reporting. Comparing the expenses and turnover of each department can give a company an idea of how efficient and effective each one is.

- Non financial disclosures

- **Sustainability report**

It represents the activities and performances of an organization that have a direct impact on society, environment, and economic (CO₂ emissions, water usage, gender diversification ...). Sustainability report influence the reputation of the company, and ultimately, its profitability.

- **Country report**

- Market data

- **Market price of stock**

Note: big companies like Apple, Google etc. are traded in more than one stock exchange. Therefore, the market price of their stock shown on their website relate to the major exchange that they are traded in.

- **Volume traded (of the shares)**
 - **Value of bonds**

Note: A bond is a financial instrument that represents a loan made by an investor to a borrower (typically companies or governments). Bonds are used to finance investments and operations.

- **Industry and economic data**

Sources selection ⇒ financial disclosure: SEC filings

SEC (US Securities and Exchange Commission) filling is a financial statement submitted to SEC by **publicly traded corporations**

These are the major reference documents adopted by analysts and investors. There are different types of formats (some of them):

- **Form 10-K:** audited financial statement
- **Form 10-Q:** unaudited financial statement
- **Form 8-K:** current report companies must file to announce major events
- **Form 20-F:** annual financial statement filled by a non US company that has listed equity shares in the US

Audited financial statements are the company's financial statements provided by a person or a firm after being thoroughly checked and governed for providing accurate and reliable information to their shareholders and investors. **Unaudited financial statements** are not examined or verified by an external independent auditor. Unaudited financial statements show the same financial data as audited ones. However, it is quicker and cheaper to draw them up than to go through the audit process. Only annual financial statements are audited whereas quarterly and half-yearly statements are unaudited.

3. Common-size analysis

Common-size analysis is the restatement of financial statement information in a standardized form. There are two types of common-size analysis:

Vertical common-size analysis uses the aggregate value in a financial statement for a given year as the base, and each account's amount is restated as a percentage of the aggregate.

- Balance sheet: Aggregate amount is total assets.
- Income statement: Aggregate amount is revenues (Europe) or sales (US).

Horizontal common-size analysis uses the accounts in a specified year as the base, and subsequent years' amounts are stated as a percentage of the base value. (At least 5 years should be taken into account)

- Useful when comparing growth of different accounts over time.

Note: We should first apply vertical common-size analysis and then horizontal analysis.

Note: Using vertical common-size analysis, the percentage of tangible and intangible assets can help us to identify the type of the company. If the fixed assets (PPE) of the company are greater than the intangible ones, this company most likely is a manufacturing one.

Operating income Operating income is a company's earnings before interest and taxes (EBIT); it is also referred to as the operating profit or recurring profit.

Non-operating income is the portion of an organization's income that is derived from activities not related to its core business operations. It can include items such as dividend income, interest, and gains or losses from investments. A private university may classify tuition received as operating revenue, whereas gifts from alumni are considered non-operating revenue (because they are not part of ordinary university operations). If the non-operating revenues get bigger than the operating revenues, it is a bad signal for the company.

Apple Inc. Condensed Income Statement		
	Three Months Ended	
	Jun 29, 2019	Jun 30, 2018
Net sales:		
Products	\$42,354	\$43,095
Services	11,455	10,170
Total net sales	53,809	53,265
Cost of sales:		
Products	29,473	28,956
Services	4,109	3,888
Total cost of sales	33,582	32,844
Gross margin	20,227	20,421
Operating expenses:		
Research and development	4,257	3,701
Selling, general and administrative	4,426	4,108
Total operating expenses	8,683	7,809
Operating income	11,544	12,612
Other income/(expense), net	367	672
Income before provision for income taxes	11,911	13,284
Provision for income taxes	1,867	1,765
Net income	\$10,044	\$11,519

Goodwill is classified as an intangible asset on the balance sheet, since it can neither be seen nor touched. Goodwill arises when a company acquires another company for a price in excess of fair market value of net identifiable assets acquired. Examples of assets that are goodwill include a company's brand name, customer relationships, and any patents or proprietary technology. Goodwill is never amortized, because it is considered to have an indefinite useful life. Instead, it should be assessed for impairment. If the fair market value goes below historical cost (what goodwill was purchased for), an impairment must be recorded to bring it down to its fair market value. However, an increase in the fair market value would not be accounted for in the financial statements.

Example:

Case

- Company A acquires fully Company B, at 5.000 k€
- Knowing the following data on assets and liabilities of Company B:
 - Property/plant/equipment= 7.000 k€ (Fair Value of PPE = 9.000 k€)
 - Intangible Assets = 4.000 k€
 - Liabilities = 11.000 k€

1. What is the fair market value of net assets acquired?

- Total Asset (at Fair Value) = PPE (at fair value) + Intangible assets =
9000 + 4000 = 13.000 k€
- Total Liabilities = 11.000 k€

$$\text{Fair market value of net asset aquired} = \text{Total assets (FV)} - \text{Total Liabilities} = 13.000 \text{ k€} - 11.000 \text{ k€} = 2.000 \text{ k€}$$

2. What is the goodwill?

$$\text{Goodwill} = \text{acquisition cost} - \text{fair market value of net asset aquired} = 5.000 \text{ k€} - 2.000 \text{ k€} = 3.000 \text{ k€}$$

Minority interest (or non-controlling interest) is the portion of a subsidiary corporation's stock that is not owned by the parent corporation. The magnitude of the minority interest in the subsidiary company is generally less than 50% of outstanding shares.

Minority interest belongs to other investors and is reported on equity section of the consolidated balance sheet of the parent company to reflect the claim on assets belonging to other non-controlling shareholders. In addition, minority interest is reported on the consolidated income statement as a share of profit belonging to minority shareholders.

Reserves refer to a portion of shareholders' equity and define as accumulated of profit from previous years.

Liabilities with explicit interest rate are any type of liability with contractually defined interest rate. This kind of liabilities refer to any type of loans, bonds, and debts with an interest on it. However, everything related to trade payables, tax authorities, employees, and their pensions are not included in this type of liabilities.

Generally, the liability part is connected to stakeholders including banks, clients, employees, government and local authorities

Statement of changes in equity

A statement of changes in equity details the changes within the equity section of the balance sheet over a designated period. The report shows the amount of money earned by a company in exchange for its stock to investors. Therefore, within this document you can find everything connected to the additional issue of the shares of the company.

Cash Flow Statement (CFS)

A cash flow statement is a financial statement that summarizes the amount of cash and cash equivalents entering and leaving a company, and breaks the analysis down to operating, investing, and financing activities.

4. Reclassification and adjustments

Accounting principles might differ between organizations. Accounting choices can vary from one organization to another. Therefore, reclassification and adjustments aim to reorganize financial statement in order to:

- Increase their readability
- Underline key financial results
- Improve the comparability between different enterprises

What is object of reclassification and adjustments?

- Balance Sheet
- Income statement

The Balance Sheet reclassification

- FC: Fixed Capital

BALANCE SHEET (IAS/IFRS)	RECLASSIFIED BALANCE SHEET
1. NON-CURRENT ASSETS	1. FIXED CAPITAL
1.1 Property, plant and equipment	1.1 Property, plant and equipment
1.2 Investment property	1.2 Investment property
1.3 Goodwill	1.3 Goodwill
1.4 Other intangible assets	1.4 Other intangible assets
1.5 Equity investment	1.5 Equity investment
1.6 Other non-current financial assets	1.6 Other non-current financial assets
1.7 Deferred tax	1.7 Deferred tax

The main purpose of identifying fixed capital or fixed assets is to understand what we have for producing physical goods and/or services in the future. Therefore, as you can see from the above table, there is no difference between the types of assets but there may be difference in the numbers.

Example 1: considering a pharmaceutical company, in the intangible assets section, company has some patents that one of them will be expired this year, which means that the company should not include this patent in the fixed assets.

Example 2: assume a company that has a plant that is going to be closed and sold within the next 12 months because the company is constructing a new plant. Applying reclassification process, the former plant should be excluded from fixed assets (PPE line) and the amount of money that has already spent on the new plant should be included in fixed assets (PPE line).

Overall, reclassification provide information for our investors regarding real assets that we have and can be used in the future to realize products and/or services.

- **NWC: Net Working Capital**

The definition of Net Working Capital is linked to the notion of working capital cycle. The working capital cycle is defined as the average time it takes to acquire materials, services and labor, manufacture the product, sell the product and collect the proceeds from customers.

Net Working Capital is a measure of the operating liquidity of a company and represents the amount of the liquidity necessary to run the business during the working capital cycle. Therefore, it takes into account:

- Receivable
- Payables
- Inventories

NWC underlines the ability of an organization in managing the operating cycle (receivable, payables, and inventories).

NET WORKING CAPITAL	
Trade and other receivables	+
Inventories	+
Ordered work in progress	-
Provisions for liabilities and charges	-
Deferred tax liabilities	-
Trade and other payables	-
Current tax liabilities	

In practice there are different labels and formulas that are used with reference to Net Working Capital = Current assets – Current liabilities

Note: a positive net working capital implies that the company has enough liquidity to meet its short-term obligations.

Derivative is a contract that can be used for insuring against price movements of a product (hedging). Usually, in this contract the price and amount of the product is mentioned. Therefore, if the price goes up or down, it does not have any effect on our purchasing price of the product. Derivative is registered as an expense in financing activities of the cash flow statement.

- **NFD: Net Financial Debt**

NFD measures the ability of the enterprise to reimburse its debts if they were all due today. It is calculated by adding short-term and long-term debt (with explicit interest rate) and subtracting all cash and cash equivalents.

NET FINANCIAL DEBT	
Bonds (non current + current)	+
Bank debts (non-current + current)	+
Other financial current and non-current liabilities	-
Cash and cash equivalents	

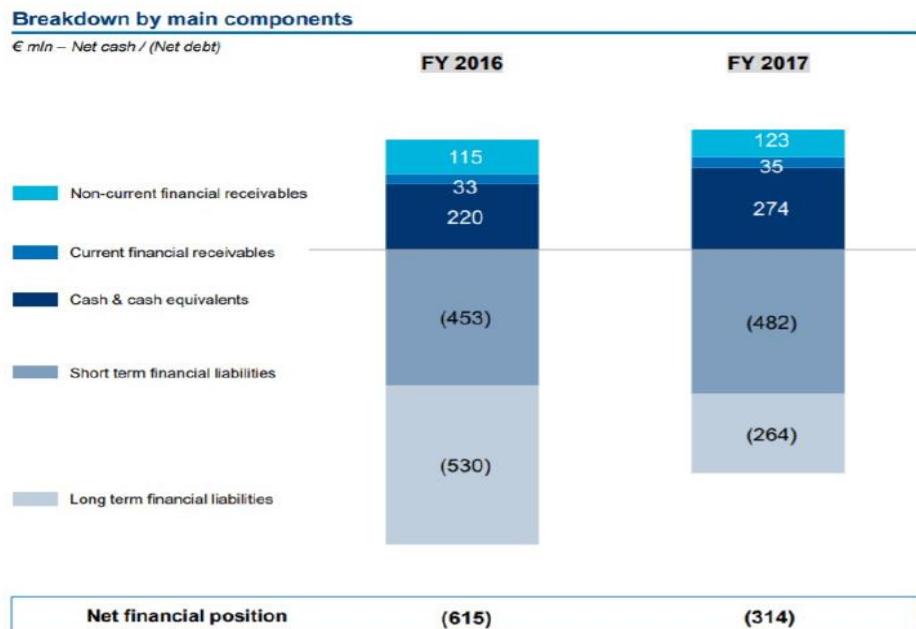
$$NFD = \text{financial liabilities} - \text{cash and cash equivalents}$$

Financial liabilities: borrowing from banks, bondholders, credit institutions and so on.

Operating liabilities: connected with the supply of goods or services, e.g. trade payable.

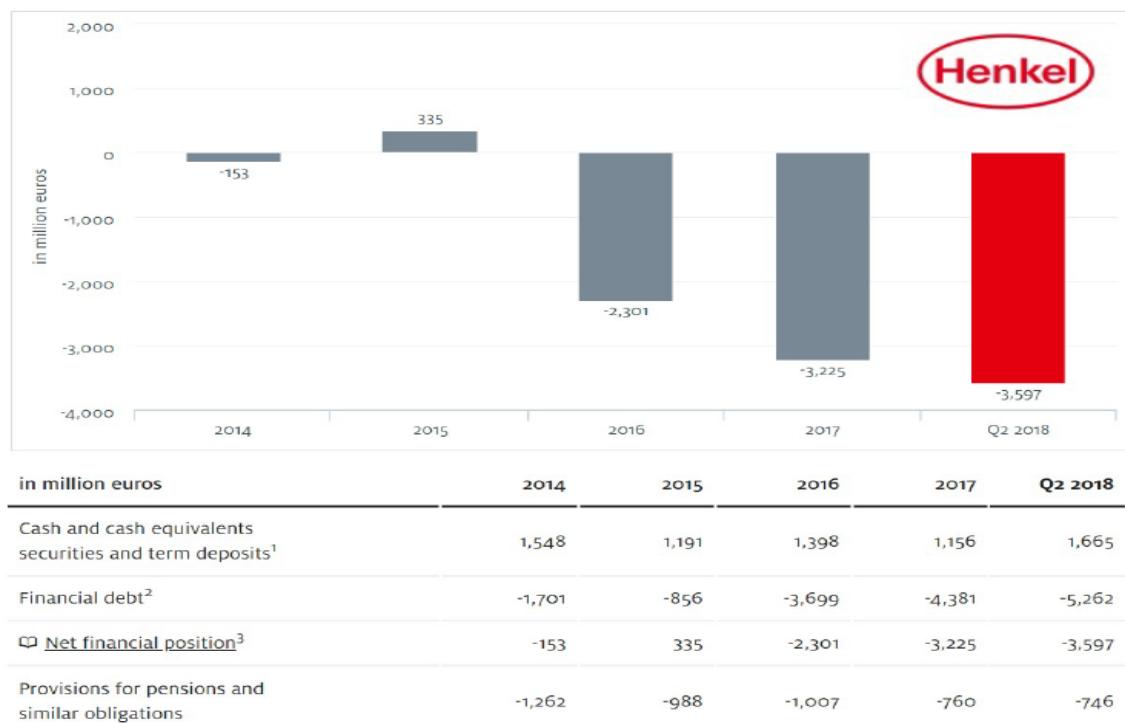
Note: In practice, there are different labels and formulas that are used with reference to net financial debt, such as Net Financial Position: i.e. (cash minus debt)

Note: In the re-payment to the borrowers, entity shall take into consideration the cash and equivalents, but also short-term and long-term financial receivables.



Note: having a negative net financial position does not mean a company is in a bad situation. Because it is normal, if a company has loans and it would be strange, if the company can cope with all its short and long-term loans just with cash.

Note: a normal company try to maintain its level of cash and cash equivalents within some operations requirements while if they decide to make any type of investments, most likely they use debt, loans or bonds.



The following table summarizes the group's balance sheet and financial position at 31 December 2017:

in millions of euros	31.12.2017		31.12.2016		Change %
	Amount	%	Amount	%	
Trade receivables	325.23	73.8	308.91	83.4	5.3
Inventories	309.69	70.3	278.91	75.4	11.0
Trade payables	(502.61)	(114.1)	(476.82)	(128.8)	5.4
Other, net	(105.49)	(23.9)	(107.58)	(29.1)	(19)
Net working capital	26.82	6.1	3.42	0.9	n.s.
Property, plant and equipment	95.09	216	88.17	23.8	7.8
Intangible assets	362.16	82.2	332.77	89.9	8.8
Investments	44.03	10.0	26.02	7.1	69.2
Non-current assets	501.28	113.8	446.96	120.8	12.2
Provision for severance indemnities and other provisions	(87.52)	(19.9)	(80.26)	(21.7)	9.0
Net invested capital	440.58	100.0	370.12	100.0	19.0
FINANCED BY:					
Net debt	50.05	11.4	99.94	27.0	(49.9)
Non-controlling interests	21.31	4.8	14.64	4.0	45.6
Group equity attributable to equity holders of the parent	369.22	83.8	255.54	69.0	44.5
Total sources of financing	440.58	100.0	370.12	100.0	19.0

Income statement reclassification

A company's Earnings before Interest, Taxes, Depreciation, and Amortization (**EBITDA**) is a measure of a company's profitability of the operating business only. It is derived by subtracting from revenues all costs of the operating business (e.g. personnel costs, costs of raw materials, general and administrative expenses ...) but not depreciation, amortization, interest, impairment, and taxes.

- EBITDA = Net Income + Taxes + Interest Expense + Depreciation & Amortization
- EBITDA = Operating Income (EBIT) + Depreciation & Amortization

Depreciation can be defined as the loss of value of a tangible or physical asset because of its usage overtime. The depreciation is based on the idea that the more a company use a certain asset, the lower the value of that asset is. **Amortization** is an accounting technique used to periodically lower the book value of an intangible asset over a set period.

Note: Depreciation and amortization is not money that a company pays to someone, but it is the value reduced from its tangible and intangible assets. Then, the company use it to repurchase new assets when the current ones become obsolete. Therefore, it is a non-cash expense and it is added back in the cash flow statement.

EBITA is not used as commonly as EBITDA, which adds depreciation into the calculation. Some companies, such as those in the utilities,

RECLASSIFIED INCOME STATEMENT
Total Revenues
Raw Material
General and administrative expenses
VALUE ADDED
Personnel costs
EBITDA
Depreciation and Amortization
EBIT
Net financial Expenses (income)
Earnings before tax and extraordinary items
Extraordinary gain (losses)
Pretax Income
Tax
NET INCOME

manufacturing, and telecommunications industries, require significant expenditures in equipment and infrastructure, which are reflected in their books.

Extraordinary gain (loss) line in the income statement refer to operations that happen just one year and it is not related to the core business of the company. For instance, selling a plant.

Adjustments

Adjustments refer to the amendment of an item (number) disclosed in annual reports.

Why? When unexpected events occurred or when accounting principles have changed over the years, the disclosed numbers in annual reports can be revised to provide a fair representation of the current situation.

What is adjusted? Operating profit, net profit, current assets, expenses (rarely) and so on are typical items that can be adjusted.

Example of adjustment in income statement:

(€ million)	Years ended December 31		
	2017	2016	2015
Net profit from continuing operations	€ 3,510	€ 1,814	€ 93
Tax expense	2,651	1,292	166
Net financial expenses	1,469	2,016	2,366
Adjustments:			
Reversal of a Brazilian indirect tax liability	(895)	—	—
Impairment expense	229	225	118
Recall campaigns - airbag inflators	102	414	—
Restructuring costs	95	88	53
Resolution of certain Components legal matters	43	—	—
Deconsolidation of Venezuela	42	—	—
Costs for recall - contested with supplier	—	132	—
NAFTA capacity realignment	(38)	156	834
Tianjin (China) port explosions (insurance recoveries)/costs	(68)	(55)	142
Gains on disposal of investments	(76)	(13)	—
Change in estimate for future recall campaign costs	—	—	761
NHTSA Consent Order and amendment	—	—	144
Currency devaluations	—	19	163
Other	(10)	(32)	(46)
Total Adjustments	(576)	934	2,169
Adjusted EBIT	€ 7,054	€ 6,056	€ 4,794

Thousands of cars destroyed in Tianjin port explosions

In order to show investors the actual performance of the company in the financial year in which port explosions happened (also in the next years), managers excluded the costs related to this occurrence. Otherwise, shareholders might think that the company was not performing well, while it was not true and managers were operating the business very well.

Note: adjustments related to the fluctuation of the currencies are very common and usually big multinational companies may consider this kind of adjustment in their financial statements.

Benchmarking

Benchmarking and comparison analysis help us to understand how a company is performing compare to its competitors, thus showing its efficiency and effectiveness. In addition, it provides additional information to investors and shareholders and help them to decide between holding and selling their shares.

Different definitions can be found in the following:

- The continuous process of measuring its own products, services, practices against the toughest competitors or those companies recognized as industry leaders.
- A kind of performance improvement process by identifying, understanding and adopting outstanding practices from within the same organization or from other businesses.
- The process of continuously comparing and measuring an organization against business leaders in the world to gain information, which will help to take actions to improve its performance.
- A comparison with other companies (not necessarily competitors)

What is not benchmarking?

Benchmarking never....

Ends: it is a continuous process that needs recalibration in the perspective of continuous improvement

Copies: information learned is not copied but adapted to the specificities of context (company's history, needs, culture, structure ...)

Cheats: it should be an honest, legal and virtuous analysis

The process of benchmarking

1. Identify the strategic objectives

Performance orientation

Identification of best practices in terms of financial and non-financial indicators like flexibility, timeliness, quality, costs, ...

⇒ Comparison of indicators

Process orientation

Identification of the best practices in terms of organizational structure, responsibilities, technologies, ...

⇒ Comparison of processes

Problems

- There is no guarantee that the various best practices are comparable
- Trade-off between the benchmarked performances and the others (not measured): if benchmarked performances improve, what happens to the others
- There is the possibility of a time lag between performance (numbers) and processes
- Difficulty of focusing the analysis on competitive differential (a process includes a variety of factors)
- Difficulty to identify the link between processes and performance

2. Sample selection

Different options exist:

- Leader Benchmarking: benchmarking on a specific performance or process

- e.g. 1 (performance) Fincantieri benchmarked itself against Boeing on its quality-focused strategy
- e.g. 2 (process) IBM benchmarked itself against Federal Express on its logistics system
- Sector Benchmarking (the most common): benchmarking with companies that act within the same industry
- Internal Benchmarking: benchmarking with different units of the same company

Note: In the case of controlling management, the sector benchmarking is the most suitable approach: reasonable and feasible goals, without being under-stimulating

Type	Pros	Cons
Leader	<ul style="list-style-type: none"> ▪ Unconventional ways of working (<i>first mover advantage</i>) ▪ Stimulating(innovation oriented) ▪ Discovering of new practices 	<ul style="list-style-type: none"> ▪ Applicability of one best practice in different contexts ▪ Emphasis of the trade-off between performances when benchmarking is done for each performance
Sector	<ul style="list-style-type: none"> ▪ Feasibility of the individualized best practices ▪ Help to search for best practices in the sector 	<ul style="list-style-type: none"> ▪ Do not stimulate innovation ▪ Time consuming ▪ Difficulty to access data
Internal	<ul style="list-style-type: none"> ▪ Cheap ▪ Precision in the comparison of information ▪ Easy to access data ▪ Easy to implement 	<ul style="list-style-type: none"> ▪ Self-referential ▪ No guarantee of competitive advantage ▪ No stimulating objectives

3. Involvement modality

Two different ways:

- Unconscious ⇒ Indirect involvement of competitors

Information are gathered through websites, publications, magazines, employees, customers and vendors, suppliers, databases, reverse engineering, balance sheets and other institutional public documents.

- Conscious ⇒ Direct involvement of the competitors, which provide the needed information

Best and more precise results BUT...

- Necessity of the organizations approval
- Necessity of reveal the own data.

4. Performances choice for the comparison

Definition of the scope: identification of the areas of the company that need to be benchmarked
e.g.:

- Whole company
- Some products/services (only finished goods, service features ...)
- Work processes (manufacturing, supply, logistics ...)
- Support Functions (HR, Marketing ...)

Definition of the measurement system: definition of indicators for comparison

5. Data correction

The best practices may descend from two different reasons:

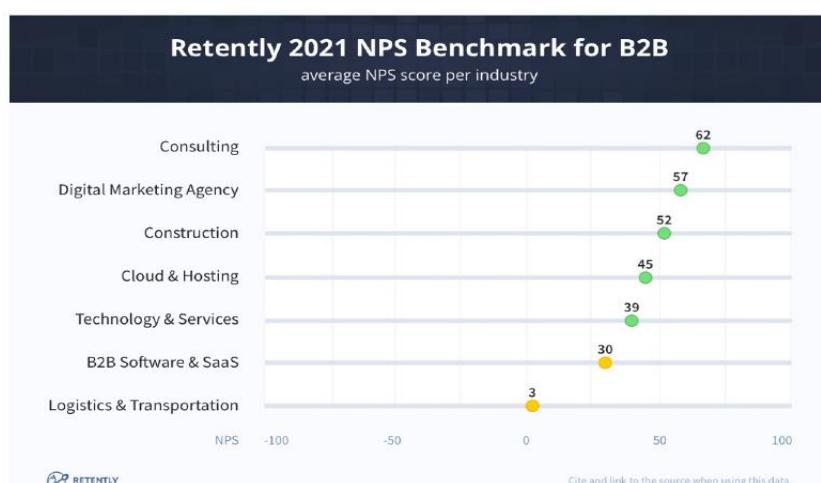
Better management: to be individualize through benchmarking

Difference in the conditions of the context: to be eliminated to make companies comparable.
Factors influencing context include:

- Scale
- Strategy (efficiency vs. effectiveness)
- Market expectations and perception
- Product itself in Leader Benchmarking

Example (non-financial indicator):

The example of an industry benchmark you may wish to use for customer service – the NPS (net promoter score).



Note: one the most important objectives of doing benchmark analysis is to identify competitive advantages of both the company itself and its competitors.

Note: Another objective of benchmarking analysis is to identify the best performances and apply them to our company. In the case of internal benchmarking, we recognize the best practices from different units and use them for other SBUs.

ASSETS	EQUITY & LIABILITIES	INCOME STATEMENT	OPENING CASH
NON-CURRENT ASSETS <ul style="list-style-type: none"> Tangible Assets Intangible Assets 	EQUITY <ul style="list-style-type: none"> Share Capital Reserves Net Income NON-CURRENT LIABILITIES <ul style="list-style-type: none"> Bank debts 	+ REVENUES - COSTS DUE TO THE OPERATING ACTIVITIES <ul style="list-style-type: none"> Cost of Materials Cost of Labour Other Operating Costs = EBITDA (Earnings Before Interests & Taxes & Depreciation & Amortization) <ul style="list-style-type: none"> Depreciation & Amortization = EBIT (Earnings Before Interests & Taxes) - COSTS DUE TO THE FINANCIAL ACTIVITIES <ul style="list-style-type: none"> Financial costs (due to Bank loans) = EBT (Earnings Before Taxes) - COSTS DUE TO THE FISCAL ACTIVITIES <ul style="list-style-type: none"> Taxes = NI (Net Income)	+ CASH FLOW FROM THE OPERATING ACTIVITIES <ul style="list-style-type: none"> EBIT D&A D&A OWC Financial costs Taxes + CASH FLOW FROM THE INVESTING ACTIVITIES <ul style="list-style-type: none"> CAPEX Disposal of assets + CASH FLOW FROM THE FINANCING ACTIVITIES <ul style="list-style-type: none"> BANK LOANS DIVIDENDS NEW SHARES
CURRENT ASSETS <ul style="list-style-type: none"> Receivables Inventories Cash 	CURRENT LIABILITIES <ul style="list-style-type: none"> Bank debts Payables 		
ASSETS & EQUITY & LIABILITIES			CASH AT THE END
			CASH FLOW STATEMENT

Exercise

1. You know the following data about the company C.

Assets as of December 31st, 2020:

- Property, plant, and Equipment: 100 mln€
- Goodwill: 200 mln€
- Equity investment: 70 mln€
- Receivables: 40 mln€
- cash and cash equivalents: 120 mln€

Liabilities and equity as of December 31st, 2020:

- Share capital: 100 mln€
- Reserves: 40 mln€
- Net profit: 10 mln€
- Bank debts: 230 mln€
- Benefits for employees: 120 mln€
- Payables: 30 mln€

The following two events will happen in the year 2021:

- Payment of dividends for 5 mln€;
- Depreciation of property, plant and equipment for 10 mln€.

What is the potential effect of these events on the company accounts? Consider the related balancing accounts and neglect any tax effect.

- a) The net profit (2021) might be negatively impacted by 15 mln€.
- b) The bank debts (2021) might decrease to 225 mln€.
- c) **The net profit (2021) might be negatively impacted by 10 mln€.**
- d) Cash and cash equivalents (2021) might decrease to 105 mln€.

Solution

Dividends will be paid as part of the net profit of 2020 in the next year, which is 2021. Therefore, it is always connected to **the year before its payment**. We can define the dividends as portion of the net profit of 2020 that involves:

- The profit attributable to the overall company
- The profit attributable to the shareholders of the company
- The profit attributable to the non-controlling interest
- Dividends

The payment of the dividends will be registered as the cash outflow in the cash flow statement of 2021 (financing activities). Dividends paid are not classified as an expense, so they have no impact on the income statement (more specifically, net profit). However, dividends paid will reduce the balance in the cash and retained earnings accounts once the dividends have been paid. Therefore, cash and cash equivalents in 2021 might decrease to 115 mln€.

Depreciation will negatively affect the net profit in the income statement of 2021. It also negatively affect the PPE value in the balance sheet of 2021. However, it does not have any effect on the cash flow statement using direct method.

2. Company A is an Italian company that produces high-quality sweets and sells them in Europe. In the following table, you can find an extract of the 2019 financial statements of company A that shows some selected financial data.

Cash flow statement 2019 (k€)

Delta NWC (final – initial)	7500
D&A	5000
Income taxes paid	2300
Dividends paid	900
Interest paid	400
Cash flow from operating activities	14000

Income statement 2019 (k€)

Cost of sales (COGS)	25000
Other period expenses	3000
General and administrative expenses	5000

Based on the available financial data and knowing that there are no deferred taxes, which answer is correct?

- a) EBIT = 20100 k€; Revenues = 53100 k€
- b) **EBIT = 19200 k€; Revenues = 52200 k€**
- c) EBIT = 4200 k€; Revenues = 37200 k€
- d) None of the above is corrected

Solution

Cash flow from operating activities = EBIT + D&A - Δ NWC - Income taxes paid - Interest paid

$$14000 = EBIT + 5000 - 7500 - 2300 - 400 \Rightarrow EBIT = 19200$$

Revenue = EBIT + D&A + Cost of sales + other period expenses + general and administrative expenses

$$Revenue = 19200 + 5000 + 25000 + 3000 + 5000 = 57200$$

3. Considering the “matching principle”, which of the following statements does NOT refer to a consequence of this principle?

- a) Equipment must be depreciated (it is the consequence of matching principle)
- b) Buying raw materials for the warehouse does not affect the EBIT (consequence)
- c) **Financial costs associated with bank loans must be paid by the end of each year**
- d) Period costs must be included in the Income Statement of the fiscal year when they are incurred (it is the consequence of matching principle)

The matching principle aims to match expenses with associated revenues for the period. The principle states that a company's income statement will reflect not only the revenue for the period reported but also the costs associated with those revenues.

Financial costs must be paid according to the specific contract. Moreover, the accrual principle does not refer to cash outflows, i.e. the term “paid” reinforces that this statement is not a consequence of the “matching principle”.

Applying the Matching Principle

Materials are bought with cash in Year 1. They are sold on credit and delivered to the customer in Year 2. Cash from the customer is received in Year 3. In which period will the transactions be recognized in each of the financial statements?

- Income Statement

The income statement has two line items that are going to be affected, revenue and cost of goods sold (COGS). If we start with year 1, we can see that the materials were purchased with cash. However, the product was not sold until year 2. The products were delivered to the customer in year 2 so revenue can be recognized during this period. The COGS must be matched with the associated revenues. Therefore, both the revenue and cost of goods sold will be recorded at the time of delivery, in year 2.

- Balance Sheet

Inventory and cash accounts on the balance sheet are affected by this transaction. Inventory is purchased in the form of materials in year 1. Therefore, the company will report an increase in inventory and decrease in cash in year 1. In year 2, this inventory is then sold resulting in a decrease in the reported inventory balance.

- Cash Flow Statement

The materials were purchased using cash in year 1. This will result in a decrease in the cash account and, therefore, a negative cash flow. Even though the product was sold in year 2, it was sold on credit so no cash is received. This means it can be recognized as revenue on the income statement, but cannot be reported in the cash flow statement as no cash has been received. A positive cash flow cannot be reported until year 3 on the company's cash flow statement.

Cash flow statement

Cash flow statement records cash in and cash out that occur during the financial year to show the net cash at the end of the year. The logic through which all of the cash out and cash in are registered is a cash logic. These flows of cash are recognized distinguishing them in three main categories. The first category is represented by operating activities. Regarding operating activities, we can identify the cash in because of the selling of the products or the cash out because of the purchasing of raw materials. If we have investing activities, we have the cash that enters and goes out because of the disposal of assets and acquisition of assets. In the financial activities, we register cash in and cash out considering changes in the equity structure of the company, repayments of bank debt or take bank loans, and the distribution of the dividend.

Cash flow statement can be defined by adopting two different approaches. Companies have the possibility of defining the cash flow statement by using direct method or indirect one. If the indirect method is adopted, the starting point is the operating profit. Therefore, it is necessary to add again all of those costs that do not represent a cash outflows (D&A). We add them because they have been previously deducted in order to calculate the EBIT. Then we need to adjust this profit by adding operating working capital. The operating working capital accounts for the variation in receivables, inventories and trade payables. If at the end of the period, the amount of receivables is higher than the amount of receivables at the beginning of the period, this means that the amount of the cash for the company is lower because we have receivables rather than having the cash inflows because of the selling of the products. The same happens with inventories. If the inventories at the end of the period are higher than the inventories at

the beginning of the period, we have negative impact on the cash. It is the opposite for the trade payables because if the trade payables are higher than what we have at the beginning of the year, the impact on the cash is positive and the reason why is because we have the debt, in this case the trade payables, rather than having the cash outflows. The remaining structure is the same of the direct method.

DIRECT METHOD		INDIRECT METHOD	
Operating activities	Euro	Operating activities	
+ Cash receipts from customers	55.000	Profit before interest and income taxes	+24.100
- Cash paid to suppliers	-7.000	+ Depreciation and Amortisation	+4.000
- Cash paid to employees	-8.500	+ Changes in receivables	-2.600
- Cash paid for other operating expenses	-10.000	+ Changes in inventories	-1.300
- Interest paid	-2.600	+ Changes in trade payables	+700
- Income taxes paid	-7.800	- Interest paid	-2.600
<i>Net cash from operating activities</i>	19.100	- Income taxes paid	-3.200
Investing activities		<i>Net cash from operating activities</i>	19.100
- Acquisition of assets	-15.000	Investing activities	
+ Disposal of assets	+3.000	- Acquisition of assets	-15.000
<i>Net cash used in investing activities</i>	-12.000	+ Disposal of assets	+3.000
Financing activities		<i>Net cash used in investing activities</i>	-12.000
- Dividends paid	-3.500	Financing activities	
+/- Repayments of borrowings	-2.700	- Dividends paid	-3.500
<i>Net cash from financing activities</i>	-6.200	+/- Repayments of borrowings	-2.700
Net increase/(decrease) in cash	+900	<i>Net cash from financing activities</i>	-6.200
Cash at the beginning of the year	+2.300	Net increase/(decrease) in cash	+900
Cash at the end of the year	+3.200	Cash at the beginning of the year	+2.300
		Cash at the end of the year	+3.200

Income statement

The income statement (profit & loss statement) shows the profit or the loss of the year. This document is defined by using an accrual logic. It is possible to define the income statement adopting two different approaches; income statement by nature or by function. The difference is in terms of how operating costs are classified.

If the income statement is recognized by nature, operating costs are classified according to their nature and are more in detail. Therefore, we will have, for example, raw material cost, labor cost, depreciation cost. In fact, costs are classified depending on the typology. On the contrary, if the income statement is defined by function, all of the operating costs are classified according to the organizational unit that is in charge of using this kind of resources. Therefore, for example, we will have costs of sales and selling, general and administrative expenses. It should be noted that apart from the operating costs, all of the other revenues and costs are the same either we are using the income statement by nature or by function.

IS by NATURE	IS by FUNCTION
Revenue	Revenue
Other operating income	Cost of sales
Changes in inventories of FP and WIP	GROSS PROFIT
Raw materials	Other operating income
Labour cost	Selling expenses
Depreciation expense	General expenses
Amortisation expense	Administrative expenses
Other operating expenses	
OPERATING PROFIT	OPERATING PROFIT

We are now focusing on the structure of the income statement by function:

- The difference between revenues and cost of goods sold is defined as **gross profit**.
- **Other operating income** related, for example, to rent and royalties, which are not related to the production, but still we are defining them as operating revenues.
- **Financial expenses and incomes** consider all of the expenses and the incomes that are related to financial activities. For example, the interests on the bank debt is a financial expense. While, the incomes from investments in other companies or the incomes from shares in associates are financial income.
- **Profit from the year from continuing operations** are all revenues and costs from the traditional and normal activity of the company. We can also have, instead, some other activity or some other revenues and expenses that are defined as **discontinued operations**. For example, the selling or the purchasing of a branch of a company, the acquisition of a new business. More specifically, the revenues and costs that come from unusual activities respect to the traditional activity of the company comprise discontinued operations.

The difference between the income statement by nature and by function can be identified until the operating profit. From the financial expenses, going on, the structures of both types of income statement are the same.

REVENUES	OPERATING ACTIVITY
- COST OF SALES	
GROSS PROFIT	FINANCIAL ACTIVITY
+ OTHER OPERATING INCOME	
- SGA EXPENSES	FISCAL ACTIVITY
OPERATING PROFIT (EBIT) - NOI	
- FINANCE EXPENSES	DISCONTINUED ACTIVITY
+ FINANCE INCOMES	
PROFIT BEFORE TAXES	DISCONTINUED ACTIVITY
- TAXES	
PROFIT FROM THE YEAR FROM CONTINUING OPERATIONS	
+/- RESULTS FROM DISCONTINUED OPERATIONS	
NET PROFIT OF THE YEAR	

If a company is a listed company in stock exchange, it should also provide the value of the earning per share (EPS). At the end of the income statement, after the net profit, we can identify the so-called EPS. The idea is to define the value of one share that is delivering to the shareholders. The EPS can be calculated by adopting two different formulas and both of them are shown within the income statement. The first formula considers the earning per share as the base earning per share (BEPS). It is calculated by considering the profit or the loss of the year minus the preferred dividends that are delivered to the shareholders; divided by the number of the shares outstanding. Finally, we can find the unitary value of one share.

Profit/Loss – preferred dividends

Number of shares outstanding

The other approach to calculate the earnings per share is defined as diluted earnings per share (DEPS). In this case, the numerator is the same. This value is divided by the number of the shares outstanding plus the convertible instruments. Convertible instruments include warrants, stock options, and convertible preferred shares. Therefore, we are talking about

additional rights of shareholders. If these people exercise these additional rights, the number of shares increase and as a result, the unitary value of the shares decreases.

Profit/Loss – preferred dividends

Number of shares outstanding + Convertible instruments

4. Company A is a multinational company that competes in the transportation sector, producing and selling cars, trucks, and construction equipment. Company A is preparing the Annual Report as of December 31st, 2020. The following data are available (all data are in million €):

- R&D Expenses: 1,835 M€
- Selling and Administrative Expenses: 3,900 M€
- Other operating expenses: 25 M€
- Other operating income: 60 M€
- Income taxes: 1,020 M€
- Cost of Goods Sold: 32,230 M€
- EBIT: 4,830 M€

Company A is also evaluating the effect of the impairment test of a production line, following an event happening at the very end of 2020. More specifically, this information is available:

- At the end of 2020, the production line has a book value of 3 M€, a fair value of 1 M€ and a value in use of 4 M€;
- At the beginning of 2020, this production line had a book value of 4 M€, a residual useful life of 4 years;
- The production line is amortized with a straight line and constant method;
- The list of available data above is prepared before the impairment of this production line and already considers the regular depreciation of the production line (i.e., before the impairment test).

Which of the following sentences is TRUE?

- a) Gross Profit = 10,530 M€; Revenues = 42,760 M€
- b) Gross Profit = 10,530 M€; Revenues = 42,757 M€
- c) Gross Profit = 9,510 M€; Revenues = 41,740 M€
- d) Gross Profit = 10,590 M€; Revenues = 42,818 M€

Solution

If we have an impairment loss, we have to show this loss on the income statement. Decrease of the value of the asset is shown on the balance sheet but also in other operating income/expenses account of the income statement.

The production line is NOT impaired, thus it has NO EFFECT on Gross Profit nor on net sales.

- Recoverable amount = Max (Fair Value; Value in Use) = 4 M€
- Min (Recoverable amount; Book Value) = Book Value (no impairment)

Since the value of Revenues is not provided, the Gross Profit has to be calculated starting from the EBIT:

$$\text{Gross Profit} = 4830 - 60 + 25 + 1835 + 3900 = 10530$$

$$\text{Revenues} = \text{Gross Profit} + \text{Cost of Goods Sold}$$

$$\text{Revenues} = 10530 + 32230 = 42760$$

Financial Statement Consolidation

What is consolidation?

The consolidated financial statement combines a set of financial documents

- Balance sheet
- Income statement
- Cash flow statement
- Statement of changes in equity
- Notes to the financial statements

of separated legal entities that are controlled by a parent company (hence a group) and present them as a unique entity.

A consolidated financial statement is the financial statement of a group of companies in which assets, liabilities, revenues, costs and cash flows of each organization inside the group are presented as a unique entity. It provides external accountability for a group rather than for a single company.

Why do companies need consolidated financial statement?

First, Considering Volkswagen Group that sells cars under the Audi, Bentley, Bugatti, Lamborghini, Porsche, etc., **investors** needs to know what is the performance of the group as a whole in the market because shares of the Volkswagen Group are being traded on the market not the shares of each entity.

Second, the parent company usually does not own one hundred percent of each entity. Therefore, consolidated financial statements acknowledge what **belongs** to the company and what is the minority interest.

Third, consolidated financial statements provide a thorough picture on the company and show the overall performance derived from the decisions made for the group.

The definition of a group

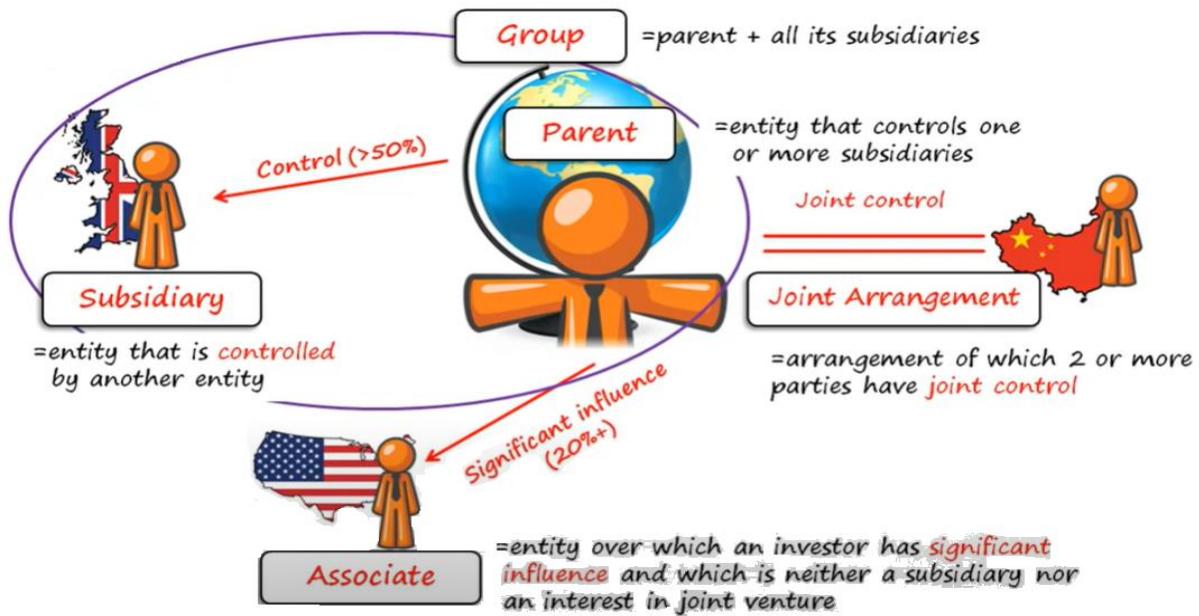
A group of companies is an economic entity formed by a set of companies (separate legal entities) which are either companies controlled by the same company (just has administrative obligations and is not producing goods or delivering services), or the controlling company itself (produce goods or deliver services itself and simultaneously has control on other companies). These are different types of configurations and does not have any effect on consolidated financial statements.

Different possible types of relationships between companies:

Subsidiary: An entity that is **fully controlled by the parent company** (it is able to make decisions and take responsibility for those decisions), which owns **more than 50% of total shares**, belonged to the entity.

Associates: An entity that another company **significantly influences its operational and strategic decisions** (consequently, the final results) because it holds **more than 20% but less than 50% of the equity** of that entity.

Joint arrangement: it is an arrangement in which two or more parties have joint control over another company. They have the same rights and decide together. Therefore, none of them has priority over another.



Type of investments

Criteria	Control	Significant influence	Joint control
Example of indicator	> 50%	> 20%	n/a
Accounting method	Full consolidation (line by line method)	Equity method	Depends on type
Other investments		Financial instruments (IFRS 9 / IAS 39) → Equity method	

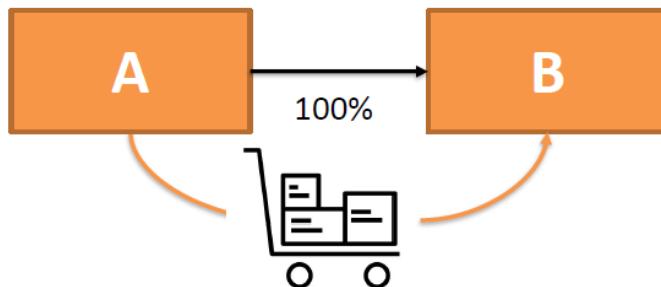
Why group accounting is needed?

To provide more reliable information about the composition of assets and liabilities of the group

A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #f2e0aa;">A</th> </tr> <tr> <th style="background-color: #f2e0aa;">Assets</th> <th style="background-color: #f2e0aa;">Liabilities</th> </tr> </thead> <tbody> <tr> <td>PPE Equity invest. Cash</td> <td>200 100 100</td> </tr> <tr> <td></td> <td>Equity Debt</td> </tr> <tr> <td></td> <td>300 100</td> </tr> </tbody> </table>	A		Assets	Liabilities	PPE Equity invest. Cash	200 100 100		Equity Debt		300 100	B <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #f2e0aa;">B'</th> </tr> <tr> <th style="background-color: #f2e0aa;">Assets</th> <th style="background-color: #f2e0aa;">Liabilities</th> </tr> </thead> <tbody> <tr> <td>PPE Inventories</td> <td>150 100</td> </tr> <tr> <td></td> <td>Equity Debt</td> </tr> <tr> <td></td> <td>100 150</td> </tr> </tbody> </table>	B'		Assets	Liabilities	PPE Inventories	150 100		Equity Debt		100 150	Before Acquisition <i>Or...</i> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #f2e0aa;">B''</th> </tr> <tr> <th style="background-color: #f2e0aa;">Assets</th> <th style="background-color: #f2e0aa;">Liabilities</th> </tr> </thead> <tbody> <tr> <td>Cash</td> <td>250</td> </tr> <tr> <td></td> <td>Equity Debt</td> </tr> <tr> <td></td> <td>100 150</td> </tr> </tbody> </table>	B''		Assets	Liabilities	Cash	250		Equity Debt		100 150
A																																
Assets	Liabilities																															
PPE Equity invest. Cash	200 100 100																															
	Equity Debt																															
	300 100																															
B'																																
Assets	Liabilities																															
PPE Inventories	150 100																															
	Equity Debt																															
	100 150																															
B''																																
Assets	Liabilities																															
Cash	250																															
	Equity Debt																															
	100 150																															
After Acquisition																																

In the case of subsidiaries, we have to exclude the equity investment that the parent company has done to acquire another company in order to avoid repetition.

To provide more reliable information about the income of the group



A sells to B finished goods for 10.000€, cost of goods sold is 6.000€ and profit is 4.000€

The purchased goods are not sold by B, but they are recorded in the inventory account that increases of 10.000€

From a group point of view, **an entity cannot recognize revenue (and related profit) from sales to another entity in the group; only sales to external entities must be recognized**. Therefore, all intragroup transactions should be eliminated from the consolidated financial statements.

Note: Minority interest or non-controlling interest refers to the percentage of the shares of subsidiaries that are not owned by the parent company.

Consolidated Income Statement

(in € million, except per share amounts)

	Note	2018	Years ended December 31,	
			2017	2016
Net revenues	4	€ 110,412	€ 105,730	€ 105,798
Cost of revenues		95,011	89,710	90,927
Selling, general and other costs		7,318	7,177	7,388
Research and development costs	5	3,051	2,903	2,930
Result from investments:		235	399	310
Share of the profit of equity method investees	12	240	400	308
Other income from investments		(5)	(1)	2
Reversal of a Brazilian indirect tax liability	22	—	895	—
Gains on disposal of investments		—	76	13
Restructuring costs		103	86	68
Net financial expenses	6	1,056	1,345	1,858
Profit before taxes		€ 4,108	€ 5,879	€ 2,950
Tax expense	7	778	2,588	1,237
Net profit from continuing operations		€ 3,330	€ 3,291	€ 1,713
Profit from discontinued operations, net of tax	3	302	219	101
Net profit		€ 3,632	€ 3,510	€ 1,814
Net profit attributable to:				
Owners of the parent		€ 3,608	€ 3,491	€ 1,803
Non-controlling interests		24	19	11
		€ 3,632	€ 3,510	€ 1,814
Net profit from continuing operations attributable to:				
Owners of the parent		€ 3,323	€ 3,281	€ 1,708
Non-controlling interests		7	10	5
		€ 3,330	€ 3,291	€ 1,713

Where the associates are recognized in the consolidated financial statements? As mentioned before, for associates we employ the **equity method**. Therefore, the results of the equity method can be seen in the consolidated income statement, financial part.

The following significant transactions with non-controlling interests occurred:

2018

- There were no significant transactions with non-controlling interests.

2017

- Disposal of the 16.0 percent of the Group's interest in FMM Pernambuco to the minority interest in January 2017, and subsequent loss of control during the third quarter of 2017, resulting in a gain on disposal of €19 million.

2016

- There were no significant transactions with non-controlling interests.

Note: Profit/loss from investments (e.g. the profit or loss on the disposal of investments) are recognized in the income statement, financial activities.

When to consolidate

IFRS 10 regulates the consolidation process. It is necessary to prepare consolidated financial statements when there is CONTROL between two parties (A exerts control over B). According to IAS/IFRS, control exists when:

Power: when there are substantive rights to direct relevant activities, voting rights or practical ability to exercise the rights. Company A (the parent) has power over the other one (the subsidiary – company B), When it has the majority of the voting rights, expressed as more than the 50%. A can have power even without having the **majority of voting rights**, like e.g. 30% but only if the other 70% of shares are assigned to many and small other people.

Exposure (rights) to variable returns: **Potential variability to positive or negative returns** (broad definition of returns). Company A is investing and does not know if the investment will give it profit or loss, so that it is taking a risk.

Ability of the investor to affect its returns through its power: Need to determine whether the “decision-maker” is an agent of another investor. **Company A can make strategic decisions and give a direction on the future result of company B**, if it has the power to decide.

Note: If these three conditions exist simultaneously, then company A has control over company B; there is control if at the same time I have power, I have exposure to variable return AND the ability to affect return.

Note: Subsidiaries are entities over which the group has control. Control is achieved when the group has power over the investee, when it is exposed to, or has rights to, variable returns from its involvement with the investee, and has the ability to use its power over the investee to affect the amount of the investor's returns.

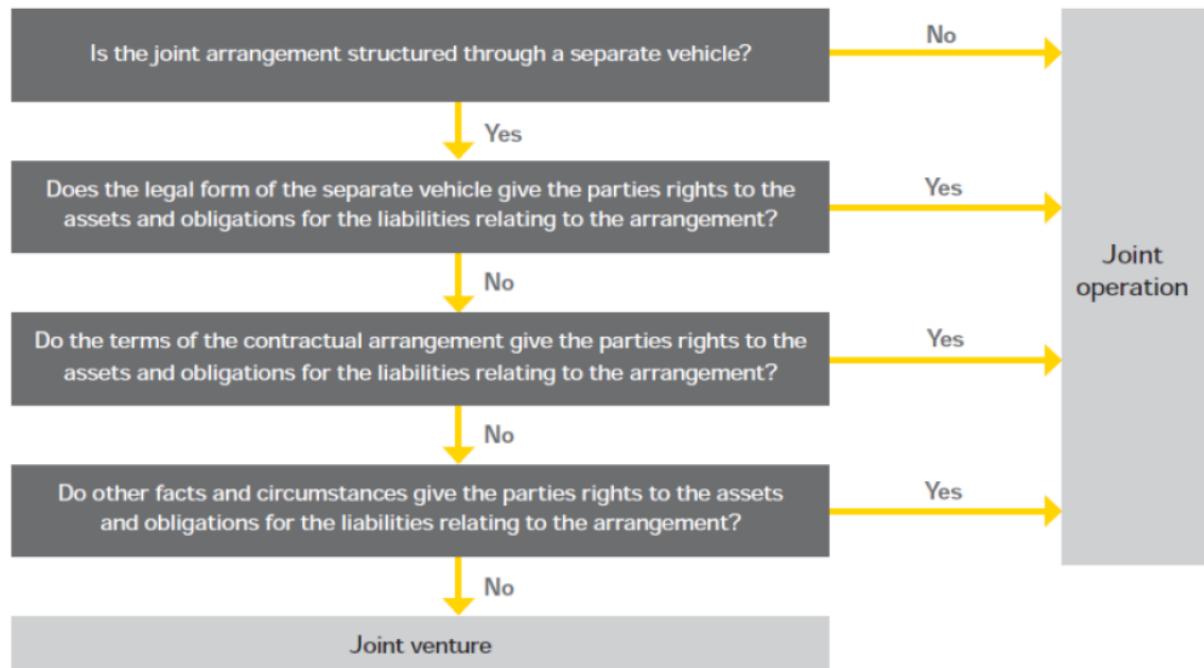
Note: Difference between associate and subsidiary ⇒ it is the notion of control

- If there is control ⇒ subsidiary
- If there is no control ⇒ associates, which are outside the scope of consolidation of the parent company.

In some cases, rather than control there can be **joint control or joint arrangements** (IFRS 11), which can be of two types:

Joint venture ⇒ **a third entity is constituted and jointly controlled by two organizations. The joint controlling companies do not have the rights on individual assets.**

Joint operation ⇒ there is not a third entity or there is a third entity constituted and jointly controlled by the joint controlling companies that have the rights on individual assets.



Note: Both subsidiaries and joint arrangements are disclosed in consolidated annual reports, but the approach to consolidation is different.

Note: Joint operations can be consolidated in the financial statements using the line-by-line method because the involved companies can clearly define what they own from the joint arrangement. The equity method can also be used for joint operations. On the contrary, in the case of joint ventures, it is impossible to consolidate them by the line-by-line method in the financial statements. Therefore, the equity method is most likely employed for joint ventures.

Consolidation process: pre-consolidation adjustments

1. Collect the individual companies' financial statements
2. Make them uniform as concerns:
 - The accounting period they refer to (differences between reporting dates cannot be longer than 3 months, otherwise it may lead to high discrepancies in the results);
 - The accounting policies (e.g. methods for D&A of assets ...);
 - The reporting currency (if necessary, translation must take place);
 - The layout of the financial documents.
3. Combine (sum up) assets, liabilities, equity, income, expenses and cash flows of the parent with those of its subsidiaries; each item shall be added according to its accounting category to determine the aggregate financial statement.

The aggregate financial statement does not show the real situation because in many cases they have duplications (e.g. intragroup transactions ...).

Pre-consolidation adjustments: closing period

When the closing date of the financial statements of one or more subsidiaries is different from that of the parent company, the **subsidiary prepares interim financial statements** at the closing date of the parent company

When this is not feasible, the closing date of the financial statements of the subsidiary and the parent company is allowed to be different on condition that:

- The difference between the **closing dates does not exceed three months**;
- The duration of the financial year and the difference between the closing dates **remain constant over time**;
- **Adjustments are made for significant transactions and events**, which occur between the closing date of the subsidiary and the closing date of the parent company.

Pre-consolidation adjustments: accounting policy

When one or more subsidiaries use different accounting policies than those adopted by the group for similar transactions, then appropriate pre-consolidation adjustments are made as part of the consolidation process. Operationally this can be achieved:

- By applying in the **subsidiaries' individual accounts the accounting policies adopted by the group, to the extent that these are not in contrast with local law**;
- By requiring the subsidiaries to **provide individual statements for the consolidation process appropriately adjusted to be consistent with the accounting policies used for the consolidated financial statements**.

Example: R&D costs

- Under US GAAP, R&D costs are expensed as incurred
- Under IFRS research costs are expensed, like US GAAP, but, unlike US GAAP, IFRS has broad-based guidance that requires companies to capitalize development expenditures, when certain criteria are met

Pre-consolidation adjustments: reporting currency

If the scope of consolidation includes companies that keep their accounts in a currency that is different from the reporting currency of the consolidated financial statements, it is necessary to translate financial statements denominated in currencies other than the reporting currency of the consolidated financial statements.

Income statement items (including the profit for the year) are translated at:

- The effective exchange rate at the date of each transaction, or
- The average exchange rate of the financial year

Balance sheet items, except for the profit for the year, are translated at the exchange rate at the reporting ("closing") date of the consolidated financial statements.

Note: consolidated financial statements are reported based on the currency of the country where **the headquarter of the parent company is located**.

If the rate used for translating income statement values does not coincide with the one used for the balance sheet, it causes a 'translation difference', which should be classified in a special owners' equity reserve named 'translation reserve' that can cover translation costs.

Pre-consolidation adjustments: aggregation

The aggregation step consists in combining (summing up) assets, liabilities, equity, income, expenses and cash flows of the parent with those of its subsidiaries; each item shall be added according to its accounting category.

A			A	B	Aggregated
Assets	Liabilities	Plant	-	100	100
Cash 300	Equity 400	Cash	300		300
Other assets 600	Debt 600	Other assets	600		600
Investments 100		Investments	100		100
B		Total Assets	1.000	100	1.100
Assets Liabilities		Owners' equity	400	100	500
Plant 100	Equity 100	Liabilities	600		600
Total Liabilities and equity		Total Liabilities and equity	1.000	100	1.100

Consolidation process: consolidation adjustments

4. Offset (eliminate) the carrying amount of the **parent's investment** in each subsidiary against the **parent's proportionate share of equity** of each – subsidiary;
5. Recognize and measure the share of equity attributable to other shareholders in non wholly-owned subsidiaries (i.e. non-controlling interests);
6. Eliminate any **intra-group assets, liabilities, equity, income, expenses and cash flows relating to transactions between consolidated entities**;
7. Calculate and allocate the group's and non-controlling interests' results;
8. Prepare the final consolidated financial statements.

Consolidation process: offset of the investment

The first consolidation adjustment consists in offsetting (eliminating) the carrying amount of the parent's investment in each subsidiary against the parent's proportionate share of equity of each – subsidiary

Case 1

The acquisition involves **100 per cent** of the subsidiary's shares (there are no non-controlling interests). There are no intra-group transactions. **The value of the investment matches the book value of the subsidiary's equity** (*Investments of A = Equity of B*).

A		B	
Assets	Liabilities	Assets	Liabilities
Cash 300	Equity 400	Plant 100	Equity 100
Other assets 600	Debt 600		
Investments 100			

Our purpose is to represent the situation as if A had acquired the assets and liabilities of B directly and in order to do so, we need to offset the item 'Investments' against B's equity value.

Since the investment in B (i.e. the accounting item "Investments") already incorporates the value of B's assets and liabilities, we need to make sure that we are not counting those values twice.

	A	B	Aggregated	Elimination of investment	Consolidated SFP
Plant	-	100	100		100
Cash	300		300		300
Other assets	600		600		600
Investments	100		100	(100)	-
Total Assets	1.000	100	1.100	(100)	1.000
Owners' equity	400	100	500	(100)	400
Liabilities	600		600		600
Total Liabilities	1.000	100	1.100	(100)	1.000

Note: in the consolidated balance sheet the equity of parent company (A) and acquired company (B) are not summed up because the subsidiary's equity must be eliminated.

Note: In most cases, the cost of the investment does not match the book value of the subsidiary's equity. In other words, this situation is not likely to happen in reality.

The purchase price paid for the investment is ideally attributable to the following components:

1. + Book value of subsidiary's equity
2. +/- Changes in values of assets and liabilities

If A acquires B, we sum up book value of parent (A) with fair value of subsidiary (B) in the balance sheet. If the fair value differs from the book value, we need to make an adjustment. For unrecognized surpluses in assets' and liabilities' values, we add the surpluses (positive or negative) to the subsidiary's assets and liabilities values, so that all the subsidiary's assets and liabilities are recognized at their fair values at the time control is acquired.

Fair value is the value attributable to the assets or liabilities at which those assets or liabilities could be sold in the market at a specific time.

3. -/+ Tax effects on those changes

The tax effects on such surpluses must be considered. The differences between the book and fair values of the recognized items may create 'temporary differences' that will give rise to (or will lower) taxes in the future. We want to recognize such future obligation (or benefit) through the separate recognition of deferred tax liabilities (or assets).

For example, if the book value of PP&E of company B is 100, but its fair value is 80, this difference between the book and fair values is recognized as a loss in the consolidated income statement (financial activities) and lower the EBT, thus decreasing taxes.

4. +/- Goodwill

The difference between (i) the cost of acquisition (investment or equity investment) and (ii) the parent's interest in the fair value of the subsidiary's net assets/ liabilities at the acquisition date must be recorded in the following way:

a) **If positive** (price paid > fair value of equity attributable to the parent), it must be included as an asset, the so called '**goodwill**', in the consolidated financial statements;

b) **If negative** (price paid < fair value of equity attributable to the parent), estimates of the fair values of assets/ liabilities of the subsidiary should be reviewed; the negative difference - if still existing - **must be allocated to the consolidated income statement as a gain (financial activities)**.

Note: The situation b rarely happens, and if it happens, it is most likely a sign of an existing problem in company B. Therefore, after reviewing the fair values of assets/ liabilities of the subsidiary, the situation most likely change from b to a. However, if it remains higher than the cost of acquisition after reviewing the fair value, company A must recognize it as a gain in P&L.

Example LVMH 2017 acquisition of Dior

French billionaire Bernard Arnault moved to consolidate control over Christian Dior for about 12.1 billion euros (\$13.2 billion), folding the fashion house's operations into the LVMH luxury empire in one of his biggest transactions.

LVMH rose as much as 4.9 percent in Paris trading, while Dior gained as much as 13 percent.

Dior investors can choose payment in cash or stock of Hermes, using shares in the rival Paris-based luxury company that the Arnault family received in 2014 after a controversial effort by LVMH to build a stake.

CONSOLIDATED BALANCE SHEET

ASSETS [EUR millions]	Notes	2017	2016	LIABILITIES AND EQUITY [EUR millions]	Notes	2017	2016
Brands and other intangible assets	3	13,714	13,335	Share capital	15.1	152	152
Goodwill	4	16,514	10,401	Share premium account	15.1	2,614	2,601
Property, plant and equipment	6	13,206	12,139	Treasury shares and LVMH share-settled derivatives	15.2	(530)	(520)
Investments in joint ventures and associates	7	639	770	Cumulative translation adjustment	15.4	357	1,165
Non-current available for sale financial assets	8	789	744	Revaluation reserves		1,472	1,049
Other non-current assets	9	868	777	Other reserves		19,658	17,965
Deferred tax	27	1,738	2,058	Net profit, Group share		5,129	3,981
Non-current assets		47,468	40,224	Equity, Group share		28,852	26,393
Inventories and work in progress	10	10,908	10,546	Minority interests	17	1,408	1,510
Trade accounts receivable	11	2,737	2,685	Equity		30,260	27,903
Income taxes		780	280	Long-term borrowings	18	7,046	3,932
Other current assets	12	2,919	2,343	Non-current provisions	19	2,474	2,342
Cash and cash equivalents	14	3,738	3,544	Deferred tax	27	3,910	4,137
Current assets		21,082	19,398	Other non-current liabilities	20	9,857	8,498
Total assets		68,550	59,622	Non-current liabilities		23,287	18,909
				Short-term borrowings	18	4,530	3,447
				Trade accounts payable	21.1	4,540	4,184
				Income taxes		763	428
				Current provisions	19	404	352
				Other current liabilities	21.2	4,766	4,399
				Current liabilities		15,003	12,810
				Total liabilities and equity		68,550	59,622

Note: LVMH paid €12.1 billion to Dior, using its profits from previous years, reserves, long-term and short-term borrowings and shares of another company owned by LVMH group. The last one affected the balance sheet through the asset side. In other words, these shares are in the asset side of the consolidated balance sheet of the LVMH group.

Note: Share capital is not changed because we should exclude both the investment equity of the parent company and the equity of the acquired company in the consolidated BS.

Case 2 (Micky – Mouse)

On 31 December, company Micky buys 100% of shares in company MOUSE. The cost of the investment is 2.700. The balance sheet of the two companies at the date of the acquisition is reported in the following table:

On the acquisition date, the fair value of the assets and liabilities of MOUSE equals their book value, except for plant, whose fair value is 1.000 higher than the carrying amount, and provisions, whose fair value is 200 higher than the book value.

The difference between the cost of the investment and owners' equity is recorded as goodwill.

Consider that the tax rate applied by the two companies is 50%.

	Mickey	Mouse
Non-current assets		
PPE	1.000	1.500
Goodwill		
Other intangible assets	3.000	2.000
Deferred tax assets		
Investments	2.700	
Total Assets	6.700	3.500
Owners' equity		
Common stock	3.000	1.500
Retained earnings	600	500
Non-controlling interests		
Deferred tax liabilities		
Current and non-current liabilities	3.100	1.500
Total Liabilities and equity	6.700	3.500

Note: Goodwill is an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized.

Note: When we have goodwill, we do not amortize it. Instead, we make an **impairment test**.

Note: A deferred tax asset is an item on a company's balance sheet that reduces its taxable income in the future. This money will eventually affect the business in the form of tax relief. Therefore, it becomes an asset to the company. A deferred tax asset is the opposite of a deferred tax liability, which indicates an expected increase in the amount of income tax owed by a company. An increase in the assets lead to more production and consequently an increase in income taxes.

If there were no difference between book and fair values of assets and liabilities of Mouse, the goodwill would be $2700 - 1500 - 500 = 700$.

	Mickey	Mouse	Aggregated	Elimination of investment	Consolidated SFP
Non-current assets					
PPE	1.000	1.500	2.500	1.000 [1]	3.500
Goodwill		-		300 [4]	300
Other intangible assets	3.000	2.000	5.000		5.000
Deferred tax assets		-		100 [3]	100
Investments	2.700		2.700	(2.700) [2]	-
Total Assets	6.700	3.500	10.200	(1.300)	8.900
Owners' equity					
Common stock	3.000	1.500	4.500	(1.500) [2]	3.000
Retained earnings	600	500	1.100	(500) [2]	600
Non-controlling interests		-			-
Deferred tax liabilities		-		500 [3]	500
Current and non-current liabilities	3.100	1.500	4.600	200 [1]	4.800
Total Liabilities and equity	6.700	3.500	10.200	(1.300)	8.900

[1] Recognition of surplus on PPE and provisions [1.000 and 200, respectively]

[2] Elimination of investment [2.700] and subsidiary's equity [1.500+500 = 2.000]

[3] Recognition of deferred tax liabilities $[1.000 * 0.5 = 500]$ and deferred tax assets $[200 * 0.5 = 100]$

[4] Recognition of goodwill = purchase price [2700] – book value of subsidiary's equity [2000] – increase in PP&E's value [1000] + deferred tax liabilities [500] + decrease in provision's value [200] – deferred tax assets [100] = 300

Consolidation process: non-controlling interests

Non-controlling interests arises when a subsidiary is not wholly controlled. For example, if a parent owns 85 per cent of a subsidiary, it has to consolidate 100 per cent of the subsidiary's net assets and results and report **non-controlling interests of 15 per cent**.

With regard to the measurement of the non-controlling interests, the investor may choose to measure a non-controlling interest in the investee, at the acquisition date, according to two approaches

- At fair value – the so called full goodwill accounting, or
- At the non-controlling interest's proportionate share of the investee's identifiable net assets

Example: STAR acquires LIGHT by purchasing 60% of its equity for 300 million in cash. The fair value of the non-controlling interests is determined to be 200 million. The company's tax rate is on a 40% basis.

The key figures included in the Balance Sheet of LIGHT at the date of acquisition are summarized in the front table:

The fair values for all assets and liabilities of LIGHT are equal to their book values, except for a parcel of land, a building and a trademark. The fair values of those assets are given in the following table:

Balance sheet LIGHT		
Assets 290		Equity 190
		Liabilities 100
	Book value	Fair value
Building	50	140
Land	30	75
Trademark	90	255

If the company chooses to apply the full goodwill method, the non controlling interests' value is equal to their fair value (200 million). In such a case, the total value of the company is equal to the price paid by the parent company + fair value of non controlling interests.

Consideration paid by the parent company (60%)	300
Fair value of non-controlling interests (40%)	200
Total Value (100%)	500
Goodwill can be computed as:	
Total Value	500
- Book value of equity	(190)
- Net surpluses (net of tax effects)	(180)
= Goodwill	130

The tax effect is determined as
surpluses*tax rate = $300*0.4 = 120$
Net surpluses = $300-120 = 180$

If STAR chooses to record the non-controlling interests at their proportionate share of the amount of the investee's identifiable net assets, the goodwill recognized and measured in the consolidated financial statements is only the amount attributable to the portion belonging to the parent company (i.e. STAR).

- The book value of equity for the non-controlling interests is 76 (i.e. book value of the proportionate share of the investee's identifiable net assets)
- The portion of net surpluses belonging to the controlling entity is 108 (i.e. 180 x 60%)

Price paid (60% of subsidiary FV)	300
- Book value of equity (60%)	(114) $190 * 0,6$
- Net surplus on identifiable assets (605)	(108) $180 * 0,6$
= Goodwill recognized (60%)	78

Note: using proportionate share method, there will not be any line related to non-controlling interest in the consolidated financial statements (e.g. net profit attributable to non-controlling interest). However, companies rarely use this method.

Elimination of intra-group transactions

IFRS 10 requires the full elimination of intra-group transactions between entities of the group, that consist in

- Intra-group revenues and costs, receivables and payables;
- Intercompany profits and losses, related to inventories and fixed assets;
- Intra-group dividends.

From the perspective of the consolidated financial statements, the transactions that occur between group companies are equivalent to transactions between divisions/ functions within a single company. Such transactions cannot be presented in the consolidated financial statements, as these must present only those transactions that group companies have made with third parties, i.e. outside the group.

Examples:

The supply of goods from one company to another within the group is equivalent, from a consolidation point of view, to the 'transfer' of goods from one warehouse to another, within the same company. This should not be identified by the general ledger system as a sale of goods and, by the same token, intra-group supplies should leave the consolidated financial statements untouched.

Financing provided by a holding company to subsidiaries is equal, in terms of the consolidated financial statements, to a 'cash transfer' from a division to another within the same company. This operation does not qualify as financing and consequently it should not be recognized in the group financial statements.

For example, company A (parent) gives company C (subsidiary) cash to buy a plant. In the balance sheet of C, there will be an increase in the asset side (buying plant) and liabilities side (internal debt to A). However, we should not consider it a financing activity in the consolidated financial statements. There will be no change in the asset side since cash decreased and PP&E increased correspondingly.

Elimination of intra-group payables and receivables

The adjustments posted to eliminate intercompany payables and receivables, revenues and expenses follow the steps below:

1. Identify which values of credit/debit and costs/revenues arising from intragroup transactions are recorded in the financial statements of the companies included in consolidated financial statement;
2. Make sure there is mutual equivalence between the accounts. If this equivalence is not present, reconcile intra-group values;
3. Delete the mutual accounts (receivables and payables, costs and revenues).

Elimination of intra-group profits and losses

The adjustments posted to eliminate intercompany profits and losses related to fixed assets and inventories follow the steps below:

- Adjusting the carrying values of assets that have been the subject of the intra-group transaction and that are still recognized in the balance sheet of the acquiring company; the value of these goods must be 'brought back' to the original value as if they had never been sold.

Company A has an 80% stake in Company B. On 1.1.X, Company A sold to Company B a plant for a total amount of 1.100 (book value: 900; yearly depreciation quota: 100). During the year X, Company B recorded depreciation for 110.

Adjustment 1: eliminate the surplus gain recorded by A ($1.100 - 900 = 200$). Therefore, there will be no change in the consolidated income statement. However, in the income statement of company A, 200 profit from selling the plant should be recognized.

Adjustment 2: bring back to 900 of the value of the asset recorded by B (purchased and recorded for 1.100). Therefore, there will be no change in the consolidated balance sheet. However, in the balance sheet of company B the value of the plant will be recorded as 1100. In addition, in the income statement of B, there will be cost of purchasing the plant (1100).

Adjustment 3: eliminate the amount exceeding the 'original' depreciation quota ($110 - 100 = 10$). Therefore, there will be no change in the consolidated income statement.

- Adjusting the income items related to those goods that are 'generated' by the intra-group transaction. The result of operations of companies involved in the transaction, in fact, may be changed as a result of the intra-group transaction, and this change must be eliminated.

Elimination of intra-group dividends

The adjustments posted to eliminate intra-group dividends follow the steps below:

- Eliminating the financial income, recognized by the company that receives the dividends;
- Reintegrating the reserves of the company that distributes the dividends;
- Decreasing in shareholders' equity attributable to non-controlling interests by the amount of dividends received by them.

If company A has a 100% stake in company B, dividends from the net profit of company B should be paid to the shareholders (company A). Therefore, A recognizes income from dividends of B in its income statements and B recognizes a portion of net profit as dividends to the parent company. However, these transactions are eliminated in the group financial statements to avoid duplication of dividends paid from net profit.

The distribution of dividends by a parent company to its shareholders does not constitute an intra-group transaction. In this case, those who receive the dividends (the parent's

shareholders) are external to the group, since the group is made of the parent company and its subsidiaries.

Equity method

Equity method is used when the investor holds significant influence over investee, but does not exercise full control over it, as in the relationship between parent and subsidiary.

Unlike in the consolidation method, **there is no consolidation and elimination process**.

The investor reports a proportionate share of the investee's equity as an investment (at cost of acquisition):

- **Profit / loss from the investee increase / reduce the investment account by an amount proportionate to the investor's shares**
- **Dividends paid out by the investee are deducted from this account**

Accounting-based Indicators

The aim of the analysis of an annual report is to provide a quick and useful overview of the company's main results (**performance**).

The overview summarizes relevant information about:

- The economic profit achieved and its components (**profitability analysis**: capability of the company to generate a positive difference between revenues and costs). From the ethical perspective, it is important to generate profit because a company uses resources that are scarce and limited. Therefore, if it does not generate profit, it is better to not exist even.
- The status of liquidity and its "coherence" with existing present obligations (**liquidity analysis**: the capability of the company to meet the obligations towards stakeholders, suppliers, taxes, employees ...). Therefore, it is the capability of the company to have a positive difference between cash inflows and cash outflows.

The abovementioned analysis aims at:

1. Understanding and measuring the current performance
2. Understanding the reasons why the company achieves this performance
3. Predicting the future performance: looking at the past, we want to make a short-term prediction of the results in the next 12 months.

Revenue is vanity, profit is sanity and cash is reality

Revenue is a measure of how big the company is (also shows the bargaining power), profit shows the capability to generate more revenues than costs and cash shows the capability to generate more cash inflows than cash outflows. Between profit and cash, the latter is more important because the company needs cash to invest, to buy machineries, to sustain the growth, to pay the salaries, to pay the suppliers, to pay the taxes. Therefore, at the very end, the cash is the only metric of success.

Financial analysts usually:

- Compare present with past company's performance (3-4 years) and define a historical trend, further investigating potential impacts of contingencies or non-ordinary events related to the company's own activities
- Compare the performance of the company with that of other firms (usually main competitors), further investigating potential impacts of contingencies or non-ordinary events related to the industry(ies) where the company operates

Profitability Analysis

The aim of profitability analysis is to evaluate the ability of the company in making profit and to identify its main components. Profitability analysis covers three different perspectives:

- **Shareholders' perspective** (the perspective of the owners of the company), assuming net profit (E) (i.e. the "reward" of shareholders) as the main item of analysis
- **Overall company's perspective**, assuming operating profit (i.e. EBIT) as the main item of analysis. We can also call it the perspective of middle-line managers; how managers inside the company look at the performance of the company.

Note: the middle-line managers could be in charge of a business unit or a function of the company (R&D, sales, marketing, logistics ...).

Note: The EBIT is the main component from the overall company's perspective because the middle-line managers have no control on the financial cost/income and taxes. In other words, from the operating profit, going on, the middle-line managers have no control on the income statement. Overall, they are responsible of the EBIT.

Note: Top-level managers' (CEO ...) perspective is the same as shareholders' perspective because they are the first ones that will be evaluated by shareholders. Therefore, they look at the company performance in the same way as shareholders.

Note: the main role of the CEO is to connect the company with the shareholders.

- **Stakeholders' perspective**, analyzing the effects of I (Interests) and T (Taxes) on the final net profit (E). Stakeholders' perspective refers to two main Stakeholders:

- Banks and bondholders who are interested in financial expenses (Interest)
- State or government who are interested on taxes

Note: Profitability analysis is based on the income statement.

Shareholders' perspective

$$ROE \text{ (Return On Equity)} (\%) = \frac{\text{Net Profit}}{\text{Shareholders' Equity}}$$

It measures the “interest rate” on shareholders’ equity, i.e. how much they earned on the investment they made in the company. The result of this ratio is important to shareholders because they are investors and they compare different investment opportunities to choose the best one.

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Revenues}}$$

It is also known as bottom line margin. Bottom line refers to the last line of the income statement.

It measures the percentage of revenues (i.e. the starting point of Income Statement) that shareholders can retain from it as a profit.

$$NPM = \frac{\text{Net Profit}}{\text{Revenues}}$$

$$NPM = \frac{\text{Revenues} + \text{Other Operating Incomes} - (\text{Operating Costs} + \text{Net financial costs} + \text{Taxes})}{\text{Revenues}}$$

$$NPM = 1 + \frac{\text{Other Operating Incomes}}{\text{Revenues}} - \frac{\text{Operating Costs}}{\text{Revenues}} - \frac{\text{Net financial costs}}{\text{Revenues}} - \frac{\text{Taxes}}{\text{Revenues}}$$

Note: The impact of the operating, financial and fiscal activities on NPM should be analyzed.

$$\text{Payout Ratio}(t) = \frac{\text{Dividends}(t)}{\text{Net Profit } (t - 1)}$$

It measures the percentage of net profit that is returned by cash to shareholders (dividends). It is the real monetary reward of shareholders. In about 90% of companies, the financial year begins in January 1 and ends in December 31. It should be noted that every May, the assembly of shareholders would approve the financial statements of the previous year, and then the shareholders decide what to do with the net profit of the previous year. There are two options:

- Shareholders ask for the dividends, and then the company pays the dividends.
- Shareholders decide to keep the money inside the company to sustain the growth.

Note: Considering payout ratio, it is not always the higher the better because in many cases, it is important that the shareholders assembly decide to reinvest in the company. The company needs their money to sustain the growth because asking money from banks, bondholders or other debtholders might be risky. If the shareholders decide to keep the money for themselves, it means that probably they do not trust in company's strategy or they need the money for other investment opportunities.

Note: High payout ratio means the company has no idea for the future and its proposed strategy plan for future is very weak so the company easily lose the money.

Overall company's perspective

$$ROA \text{ (Return on Assets)} = \frac{\text{Operating Profit (EBIT)}}{\text{Total Assets}}$$

It measures the ability of middle level managers to generate profit by using company's assets. It is also used in managers' internal evaluation. The main idea is to evaluate the capability of the managers to use all the resources that they have to generate a positive difference between revenues and operating costs. The difference between revenues and operating costs must be high because EBIT should also cover financial costs and taxes.

Note: The break-even point (BEP) is the point at which total cost and total revenue are equal. In other words, it shows the minimum volume of products sold to get the EBIT equal to zero.

Note: The denominator of ROA is not a good proxy for the resources that managers can actually use to generate a positive difference between revenues and operating costs. Some liabilities are not connected to the money that is invested to provide managers with resources. This kind of liabilities are liabilities without an explicit interest rate such as trade payables that is connected with the supply of goods or services. Trade payable is not the money that suppliers invest in our company to sustain the growth and to provide managers with resources, so it does not have an interest rate. Furthermore, taxes are liabilities without an explicit interest rate. Overall, to address this problem, more precise ratio called ROI (Return on Invested Capital) is defined.

$$ROI \text{ (Return on Invested Capital)} = \frac{\text{Operating Profit (EBIT)}}{\text{Total Assets} - \text{Liabilities without an explicit interest rate}}$$

Total Assets – Liabilities without an explicit interest rate = Equity + Financial Liabilities (current & non-current)

Note: The fact that there is no interest rate for liabilities means that this money is not being invested in the company (it is not part of invested capital).

Note: Equity has an interest rate, which is dividends.

$$ROCE \text{ (Return On Capital Employed)} = \frac{\text{Operating Profit (EBIT)}}{\text{Equity} + \text{Non current Financial Liabilities}}$$

ROCE put away the assumption that short-term financial liabilities (current) can be used to sustain the growth.

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit (EBIT)}}{\text{Revenues}}$$

It is also known as Return on Sales (ROS). It measures the margin percentage that can be retained from revenues. Typically, there is a psychological threshold on the ROS. It should be at least 10 percent.

Note: ROS should not be used to make strategic decisions because in the ROS we have non-differential cost.

$$\text{Asset Turnover Ratio (ATR)} = \frac{\text{Revenues}}{\text{Total Assets}}$$

It is an efficiency indicator that identifies the capability of the company to manage assets efficiently for generating revenues. The idea is how many times the assets rotate (working or producing) to generate the revenues. Typically, there is a psychological threshold on the ATR. It should be at least one. In capital-intensive sectors like oil & gas, chemical, pharmaceutical and so on, the ATR is lower than one because of many machineries, plants, and equipment. However, in digital sector the ATR is very high because the total assets are less.

$$ROA = ROS * ATR$$

Stakeholders' perspective

Ratios commonly used under the stakeholders' perspective are:

$$\left. \begin{array}{l} \text{Debt-to-Equity Ratio } \left(\frac{D}{E} \right) = \frac{\text{Liabilities}}{\text{Shareholders' Equity}} \\ \\ \text{I} \quad \text{Interest Coverage Ratio (ICR)} = \frac{\text{Operating Profit (EBIT)}}{\text{Financial Expenses}} \\ \\ \text{Average Cost of Debt} = \frac{\text{Interest Costs} \quad \text{Banks' interest + Coupon to bond holders}}{\text{Debt with explicit interest rate} \quad \text{bank debt + Bonds}} \end{array} \right\}$$

Debt-to-Equity ratio

Debt-to-Equity ratio is all the resources provided by stakeholders divided by all the resources provided by shareholders. It gives us information regarding the composition of the funding sources of the company. Typically, this number is more than one because the cost of liabilities is lower than the cost of equity because the risk for shareholders is higher than the risk for stakeholders. Therefore, the company prefers to rely on the money provided by stakeholders.

Typically, there is a psychological threshold on the debt-to-equity ratio. It should be at most three. When this number is more than three, the company perceived as risky. Of course, each industry has its own threshold. Therefore, debt-to-equity ratio also provide us with the risk profile of the company.

Note: In accounting, D means total liabilities but in corporate finance, it means bank debts. Therefore, the first ratio is computed in two different ways.

Interest Coverage Ratio (ICR)

Interest Coverage Ratio (ICR) indicates how many times the EBIT is able to cover the financial expenses. When ICR is close to one, a company can just cover the financial expenses and is not able to cover the taxes. Typically, there is a psychological threshold on the ICR. It should be at least one.

if the ratio = 1 => the net income is negative, ebit don't cover the Taxes!

3, 4 => means they are not collecting money from the bank and they are not investing, always denominator is important.

The other definition for ICR is the ratio between operating profit and banks' financial costs (interest cost). This make the value of the ratio bigger than the former definition because it does not take into account all of the financial costs (derivative, changes in currency exchange rate ...).

Average cost of debt

The return on invested capital should be higher than average cost of debt. This comparison is used in many cases but it is not fully correct because in the denominator of the ROI, there is also the equity

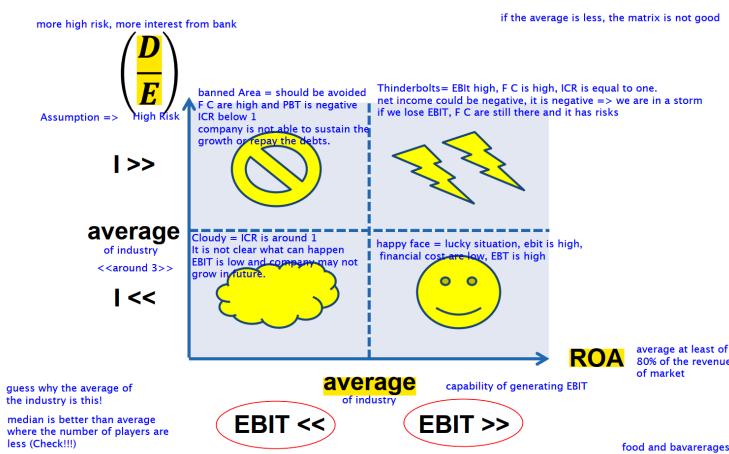
Effective Tax Rate

$$T \left[\text{Effective Tax Rate} = \frac{\text{Taxes}}{\text{Pre-tax Profit}} \right]$$

It measures the effective weight of taxation on the company's profit. This indicator is very stable over time.

Risk / Operational Efficiency Matrix

On the horizontal axis, we have the ROA and on the vertical axis debt to equity ratio. We use the average of the industry for ROA and debt to equity ratio. "I" means financial cost. If a company located in the upper part of the matrix, it is perceived risky by the banks and financial cost is bigger. On the contrary, if a company located on the lower part of the matrix, its financial cost is lower than the average. The matrix is divided into four quarters namely happy face, lightning bolts, ban and foggy areas.



In the **happy face area**, EBIT is very high and financial cost is very low means that the company is able to sustain its financial structure and generate high profit. Therefore, the company is mature, might be the **leader of the industry**, and have all the conditions to generate **high profitability**. EBT is high

The **lightning bolts area** is very **critical** because EBIT is very high but also financial cost is very high. Until a company is able to generate high EBIT, there is no problem. However, it is the risky situation because if the prices are reduced, the demand decreases or the cost of raw materials increases, there will be imbalance between EBIT and financial cost.

In the **ban area** where a company should not be in because EBIT is very low but financial cost is very high. This means that Interest Coverage Ratio might be lower than one. Therefore, the company is in a risky situation because it cannot generate profitability. EBT is negative, ICR below 1

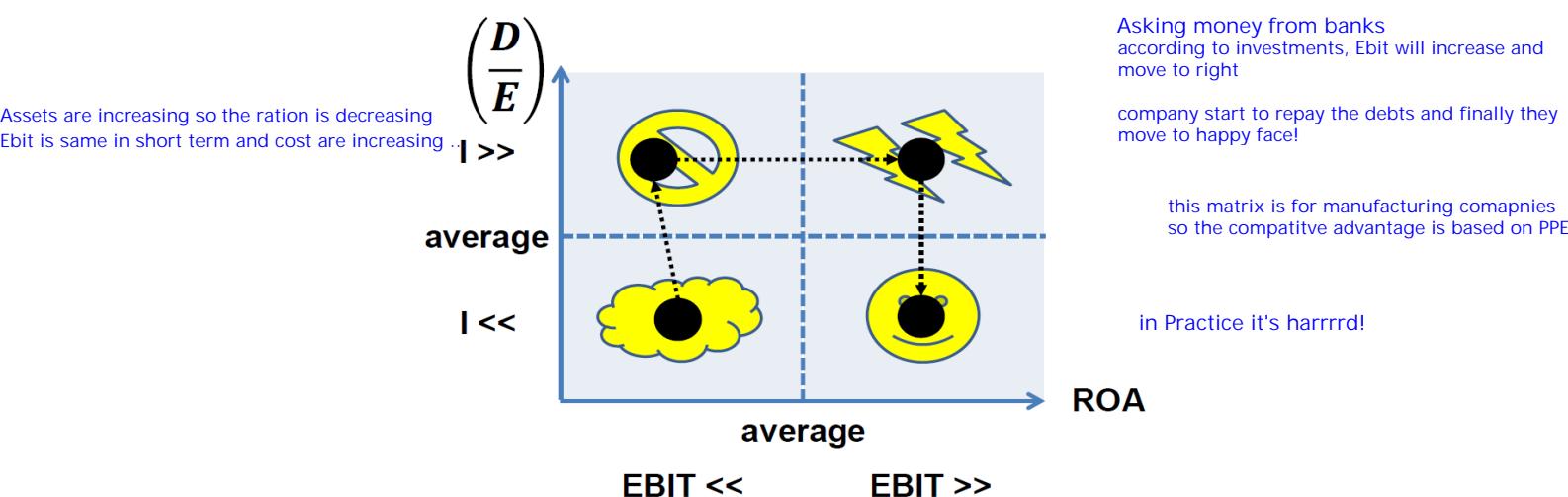
In the **foggy area**, the situation is not very clear because EBIT is very low but also financial cost is very low and they might be balanced; however, the company cannot generate enough profit. In this situation, we have opportunity cost issue and the company is just surviving and not able to generate high profitability.

Question: can a company move directly from the foggy area towards the happy face area?

This movement is possible unlikely.
this company is not competitive enough. company need to change and improve competitive advantage. for that they need money so they go to Banned Area (Next Slide)

No, it is very unlikely to happen. A company should first invest on changing its technology, organization and configuration, for example, increase its assets; buy new machineries to increase the volume of products. In order to invest, the company should ask money from stakeholders. Therefore, the financial cost will increase.

From the below diagram, we can see that after making investments, the company move from foggy area towards ban area. In the short-term, revenues remain constant because the result of investments will appear after several years. In other words, EBIT decreases because revenues remain constant and at the same time, operating cost increases. Therefore, the line between foggy and ban areas is deflected to the left. After this stage, if the investment strategy were successful, EBIT would be increased and the company move towards the lightning bolts area. In this situation, the company is capable to return the borrowed money to stakeholders. Therefore, financial cost decreases and the company move towards happy face area.



Note: The above pathway is very simple in theory but it is complicated in reality because there are many risks along this way and nothing is deterministic (e.g. reaction of competitors).

Note: If a company with 0.8 debt-to-equity ratio operates in an industry with average debt-to-equity ratio of 0.5, we cannot claim that this company is risky and cannot pay for financial cost. Therefore, if the averages change, the descriptions will be changed too.

Liquidity Analysis

ability of the company to meet its short and long term obligations to different stakeholders

The aim of liquidity analysis is to evaluate the status of liquidity and its "coherence" with existing present obligations, i.e. the ability of the company to meet its financial obligations (current and non-current liabilities) when claimed by owners of related rights.

Liquidity analysis firstly assesses the amount of money needed to sustain the operating cycle of a company (working capital assessment). Ratios are then used under two different perspectives:

- **Assets-Liabilities perspective**, analyzing "liquidity" items in the Balance Sheet;
- **Cash Flow perspective**, analyzing "liquidity" items in Cash Flow Statement

Working Capital

Net Working Capital is the amount of money needed (or generated) during the working capital cycle (the capability of a company to meet short-term obligations) and can be measured by

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

* focus on this one more!

Current assets are the assets that will be transformed to money in the next 12 months.

Current liabilities are the liabilities that will be due in the next 12 months.

Note: Net Working Capital does not consider time because for example if all current liabilities will be due in January and current assets transform to money in December, it is obvious that there is a cash imbalance.

Net Operating Working Capital = Receivables + Inventory - Payables must be more than zero

Note: In most cases, receivables and inventory account for 80% of current assets because a company possess small amount of cash due to investments and just use it for small payments in the short term. In addition, short-term investments are very small. Therefore, receivables and inventory are the main current assets.

Note: in the case of current liabilities, the payables are the most relevant item and connected with the supply of goods or services. Short-term financial liabilities are very small and large portion of financial liabilities are long-term.

Ratios in assets-liabilities perspective measure to what extent company's current assets (quick ratio further refined by isolating only most liquid assets) are readily available to pay off its current liabilities. Ratios commonly used under the **assets-liabilities perspective** are:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$



The threshold for current ratio is one, which means that the difference between current assets and current liabilities are positive ($NWC > 0$)

The higher the current ratio the better for the company, however, if the current ratio is too high, it means a company have large volume of cash that is not invested or it may represent high amount of receivables that might show low bargaining power against buyers. Therefore, if this ratio is very higher than 1, it is better to investigate the reasons for that.

Note: like Net Working Capital, current ratio does not consider time. Therefore, it cannot make us sure, that the company will meet the short-term obligations.

$$\text{Quick Ratio (Acid Test Ratio)} = \frac{\text{Cash} + \text{Short term investment} + \text{Receivables}}{\text{Current Liabilities}}$$

for Q R => current assets - inventories / current liabilities

Quick ratio only considers current assets that surely (100%) will become money. Therefore, it omits inventory (raw materials, finished goods and work in progress) from the nominator. The threshold for quick ratio is one, which means that with lower resources used in current ratio, a company should meet short-term obligations.

Note: The only difference is inventories, thus we should find out if investigated company can sell its inventories easily or not. Finally, we should choose the one that better shows the capability of the company to pay its current liabilities (meet short-term obligations).

$$\text{Inventory Turnover Ratio} = \frac{\text{Revenues}}{\text{Inventories}}$$

This ratio is very relevant for manufacturing companies. The idea is how many times the inventories rotate to generate the revenues. It also measures a company's efficiency. The lower the inventories, the better for a company because inventories are expensive and there is a risk that inventories lose their value and become obsolete. When inventory increases, it

must be high. with small amount of inventories, should generate revenues
it's hard to align sales and production

means that there is an inefficiency in production planning and sales and it finally leads to losing market share. Therefore, inventories are the measure of inefficiency.

Average Collection Time of Trade Receivables (days):

$$Days Sales Outstanding (DSO) = \frac{\text{Trade Receivables}}{\text{Revenues}} * 365$$

average delay the customers allowed to pay for the product

It is the number of days that a company allows a distributor to postpone the payments for products. Typically, the postponement of the payments is between 60 to 90 days. In the case of supermarket and restaurant (B2C), the DSO is equal to zero because customers should immediately pay after shopping or having meal. The lower the DSO, the better for a company.

Average Payment Time of Trade Payables (days):

$$Days Payable Outstanding (DPO) = \frac{\text{Trade Payables}}{\text{Purchases}} * 365$$

suppliers allow us to postpone the payment

It is the number of days that a supplier allows a company to postpone the payments for raw materials, services or products. Again, the postponement of the payments is typically between 60 to 90 days. The higher the DPO, the better for a company.

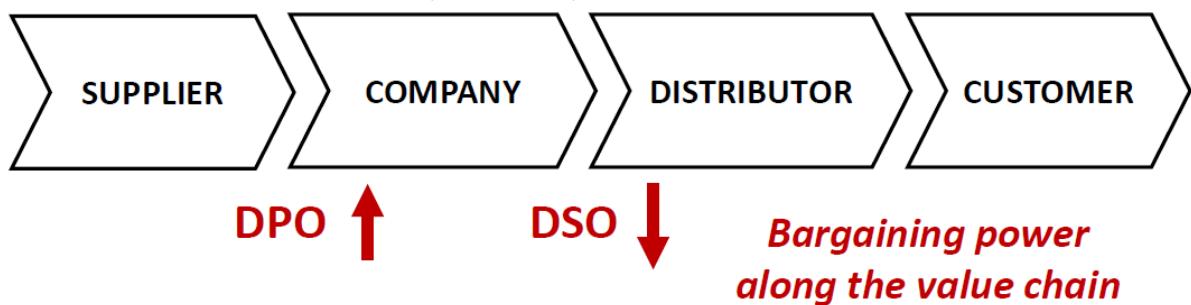
DSO and DPO are used to evaluate the bargaining power of a company along the value chain. In other words, it shows how strong a company is against suppliers and distributors. Therefore, DSO should be lower than DPO.

Note: Purchases are refer to raw materials and some services (big portion of that relates to raw materials). In the income statement by function, purchases are not shown; however, you can find it in the income statement by nature.

Question: If a company has low DSO and high DPO, why it does not try to pay the suppliers sooner? Because a company usually try to keep the available cash inside the company high to sustain the growth and make investments.

Note: sometimes a company besides promoting itself by increasing DPO and decreasing DSO, should also evaluate its supply chain against competitors' supply chain because at the end of the day the company's supply chain should have a better performance than the competitors' to generate bigger profit and sustain its competitive advantage. For example, if a distributor face a crisis, company should increase the **DSO** and feed the distributor with cash because it is part of your supply chain and it must survive for the sake of the company's survival.

Strengthening the total value chain
Co operate and compete



Ratios commonly used under the cash flow perspective are:

$$\text{Cash Flow_to_Debt Ratio} = \frac{\text{Operating Cash Flow}}{\text{Financial Liabilities}}$$

Bank debts + Bonds

Typically, the psychological threshold is at least 10 percent. If we reverse the above ratio, we can compute the number of years that it takes to generate enough cash from the operating activities to pay back the financial liabilities. Therefore, if the cash flow-to-debt ratio equals 0.1, assuming a constant cash from the operating activities over the next years, a company needs 10 years to repay its financial liabilities. Therefore, it shows the capability of a company to repay the financial debts in the long-term.

$$\text{Short-term Debt Coverage} = \frac{\text{Operating Cash Flow}}{\text{Current Financial Liabilities}}$$

It shows the capability of a company to repay the current financial debts. Therefore, it is very good for a company to have short-term debt coverage of bigger than one.

$$\text{Capital Expenditure Coverage} = \frac{\text{Operating Cash Flow}}{\text{Capital Expenditure (CAPEX)}}$$

Are the installments company pays to buy new assets(part of the value of assets)

Capital expenditure (CAPEX) are funds used by a company to acquire, upgrade, and maintain assets such as property, plants, buildings, technology, software, license, or equipment (tangible and intangible assets). Therefore, a company uses it to make investments to increase the scope of their operations and sustain the growth. It should be noted that the value of CAPEX on the cash flow statement could be refer to the full amount of investments made or to a portion of invested money (installments). For example, if CAPEX refers to the full amount of invested money, this ratio shows the number of years that it takes to generate enough cash from the operating activities equals to CAPEX.

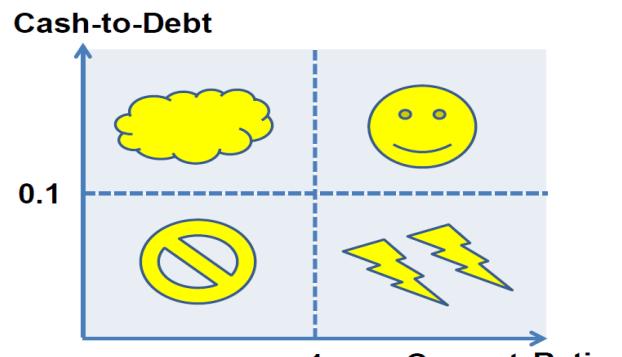
when the capex > operating cash flow => banks from loan or issue shares to shareholeder

Note: generally, operating cash flow is a synonym for the net cash flow from operating activities; however, to be more precise, it does not take into account the cash outflow for income taxes paid and interest paid. Professor recommended using net cash flow from operating activities as operating cash flow, because the difference between them caused by taxes and interest, is not big.

The Liquidity Matrix

The horizontal axis shows the capability of a company to meet obligations in the short-term or next 12 months. The vertical axis represents the capability of a company to meet obligations in the long-term or next years (short-term liabilities constitute a small portion of financial liabilities in cash flow-to-debt ratio).

In the happy face area, there is no problem to meet short-term and long-term obligations.



In the ban area, the current ratio is lower than one so a company cannot meet the obligations in the short-term. In addition, the company needs more than 10 years to repay its financial liabilities. It means that the company cannot generate enough cash from operating activities because of the improper product price, DSO, DPO or structure.

In the lightning bolt area, a company has no problem in meeting the short-term obligations but has problems in long-term ones. However, the company has time to solve the problem.

Cloudy = it's not liquid enough in short term but in long term is ok. there the sun in long term but there are problem in short term in short by increasing the debt, or DPO/DSO it can be survive

In the foggy area, a company has no problem in meeting the long-term obligations but has problems in short-term ones. Although there might be a risk of bankruptcy in the short-term, it is not a bad situation because in many ways a company can solve the problem in the short-term like asking money from shareholders or using bonds to generate cash.

Absolute Indicators: Residual Income

Residual Income is an accounting measure of net operating income minus the return expected by stakeholders and shareholders (WACC). RI represents what remains in a company after the payment of expectations of stakeholders and shareholders. EBIT should be able at least to pay the above expectations.

$$\text{Residual Income (RI)} = \text{EBIT} - K * \text{Invested Capital}$$

where:

K is the cost of capital of the company = WACC (Weighted Average Cost of Capital)

$\text{Invested Capital} = E + \text{Financial Liabilities}$

$$RI = EBIT - WACC * I > 0 \quad ROI = (EBIT / I) > WACC$$

Note: ROI must be higher than WACC.

Should we prefer residual income or return on invested capital? RI should be preferred to ROI. From the below example, we can understand that sometimes there could be a conflict between decision-making tools. Using ROI perspective, managers reject the opportunity, while, employing RI perspective, managers accept the opportunity. Therefore, even they have the same formulas, they provide managers with two opposite recommendations. However, the right choice is RI perspective because this opportunity is positive and generates value for shareholders, and helps to pay the banks and bondholders. Therefore, ROI might provide managers with wrong indications and consequently, the RI must be always used instead of ROI.

“AS IS”	“opportunity”	“MIGHT BE”
$\text{TARGET ROI} = 18\%$		$\text{TARGET ROI} = 18\%$
$\text{WACC} = 10\%$		$\text{WACC} = 10\%$
$I = 1,000$	$I = 1,000$	$I = 2,000$
$\text{EBIT} = 200$	$\text{EBIT} = 150$	$\text{EBIT} = 350$
$\text{ROI} = 20\%$		$\text{ROI} = 17.5\%$
$\text{RI} = 100$		$\text{RI} = 150$

Note: return on invested capital being a ratio prefers small size investment with very high return. Therefore, it cannot deal with very aggressive capital-intensive strategies because its denominator becomes very large. Overall, this ratio will never appreciate capital-intensive strategies. On the contrary, residual income is an absolute indicator and does not face above problem.

Note: if a company has a good financial situation and has the money for large size investments, it is better to use residual income for making strategy decisions. On the contrary,

we should analyze the company first,
we are liquid => we always use RI
we are risky/foggy/ ... => ROI is determiner
ROI is ratio and RI is absolute

ROI step by step investment
Future what will happen? Information! if we can risk so go with RI (confident darim)
Fast moving industry => ROI

If a company has some financial problems, it is recommended to use return on invested capital for making strategy decisions because this indicator can identify small size investments that are coherent to the financial situation of the company.

Note: the strategy that rises from return on invested capital is called **greedy strategy** because it aims at generating high EBIT using small size investments. In addition, this kind of strategies are short-term oriented.

Note: Suppose a company has high capability to foresight what will happen in the industry in the next 5, 10, or 15 years. In that case, it is better to use residual income because the company can implement large capital-intensive strategies (considering that the company knows what will happen in the next years). On the contrary, if a company has low capability to foresight what will happen in the industry (legislations might be changed, unclear future actions of competitors, uncertainty is high ...), it is better to use return on invested capital to get the most in the short-term.

Cash Flow ROI

$$\text{Cash Flow ROI (CFROI)} = \frac{\text{Cash Flow from operating activities}}{\text{Market Value of Invested Capital}}$$

$$CFROI > WACC$$

It is a proxy of the capability of the company to repay its resources and meets the expectations of both shareholders and debtholders.

Note: considering that the value of assets decreasing year after year (depreciation), in the denominator of CFROI market value of invested capital is used.

Note: If we reverse the above ratio, we can compute the number of years that it takes to generate enough cash to buy again your assets from the market.

Summary and conclusions

There are no "golden rules" ... even if some models exist.

There are many techniques to predict the future performance of a company, in particular to predict the bankruptcy of a company. The most well-known predictor is **Altman's Z SCORE** (1968). This score aims at predicting the bankruptcy of a company in the next 12 months. If the z score is higher than 3, the company has solid situation. If the z score is below 1.8, there is a very high probability of bankruptcy. When the z score is between 1.8 and 3, there is no idea what will happen.

$$\text{Altman's Z SCORE} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

where:

- A = net working capital / total assets
- B = retained earnings / total assets
- C = EBIT / total assets = ROA
- D = market value of equity / total liabilities
- E = revenues / total assets = ATR

** higher the return on asset => lower bankruptcy!
clear that middle line manager must maximize it!
ROA (ROI) >> WACC => repay the cost of the assets

Analysis of the Leverage

The aim of the **Financial Leverage analysis** is to understand how the company has exploited the leverage (i.e. the financial resources collected from other stakeholders than the shareholders, mainly banks) to increase the profitability. The financial leverage analysis explains return on equity as a function of debt-to-equity ratio.

Note: leverage is a ratio between total liabilities and the equity (debt to equity ratio). It helps to understand how different proportions between liabilities and the equity might affect the return on equity (final result of the company). A company tries to balance sources of funding (stakeholders and shareholders) in order to be efficient and sustainable over time.

Question: why the focus is on **ROE**?

- First, it has an historical reason. For decades all financial analyst assume it as the most relevant indicator. Therefore, it is the general opinion in the last decades.
- Second, it mirrors the expectation of the shareholders on the return from invested capital (equity). Therefore, it is a proxy of the cost of equity, which is the expectation by the shareholders on the capability of the company to generate value.

$$ROE = f\left(\frac{D}{E}\right) \quad \text{where } D = \text{Total Liabilities}$$

There are different approaches to the analysis of the Leverage. Even if they differ, the key takeaways that can be gathered are very similar. We will review three different approaches that were formalized by different stakeholders.

- Du Pont approach (developed by top managers)
- Financial analyst approach (developed by financial auditing companies - consultants)
- Theoretical approach (developed by scholars of accounting)

Du Pont Approach to Leverage Analysis

Capability to leverage (current ration between equity and liabilities in order to create ROE means increase this ration => capital from bank is better than share holders !!!!!!! cost of them differs

It is the most well-known and simplest approach.

$$ROE = f\left(\frac{D}{E}\right) \quad \text{where } D = \text{Total Liabilities}$$

$$ROE = \left(\frac{\text{Net Profit}}{E}\right)$$

$$ROE = \left(\frac{\text{Net Profit}}{E}\right) * \left(\frac{\text{Revenues}}{\text{Revenues}}\right)$$

$$ROE = NPM * \left(\frac{\text{Revenues}}{E}\right)$$

$$ROE = NPM * \left(\frac{\text{Revenues}}{E}\right) * \left(\frac{\text{Assets}}{\text{Assets}}\right)$$

$$ROE = NPM * ATR * \left(\frac{\text{Assets}}{E}\right)$$

$$ROE = NPM * ATR * \left(\frac{E + D}{E}\right)$$

$$ROE = NPM * ATR * \left(1 + \frac{D}{E}\right) \Rightarrow \text{Equity multiplier}$$

increasing must be in numerator, not decreasing the equity (like paying dividends, ...) leverage to increase assets to invest

There is a misleading interpretation of this formula that tell more you increase the equity multiplier more you increase the ROE. If you want to increase the equity multiplier, it does not mean to reduce the equity but it means to increase the liabilities, in particular, the bank debts.

It might be true that by increasing the liabilities, a company can increase the ROE. However, there is a psychological threshold on the debt-to-equity ratio. Therefore, when the bank debts increase too much and the debt-to-equity ratio goes beyond 3 (e.g. 6, 7 ...), the situation might be different. For instance, the EBIT might not be sufficient to cover financial costs and as a what happens here?

money from bank => increasing financial cost => decreasing net profit & more debt => risky and more fin. cost, EBIT decrease because of asset depreciation, salaries will increase, cost of raw increase leveraging => D/E is increasing => NPM ATR in decreasing ===> final result is not clear!

in short term roe will be decreasing, long term will be good.

result, earnings before taxes (EBT) becomes negative. In addition, return on investment might become less than the WACC. We can investigate every term of the above formula while increasing the equity multiplier:

Regarding NPM, as it was mentioned before by increasing the equity multiplier, financial costs increase and EBIT at a certain point is not able to cover it, so NPM most likely decreases and might become negative. More in detail, a company asks money from banks to invest and buy plants, machineries, patents and so on. However, there is always a time lag, meaning if a company invest today, it takes years to get returns. Therefore, EBIT decreases in the short-term because revenues in the short-term will likely remain constant but operating cost increases a lot because there are more depreciation cost, new employees cost, raw materials cost and so forth.

Regarding ATR, as it was mentioned before by increasing the equity multiplier revenues in the short-term will likely remain as they are (because of time lag between investments and get returns). In addition, assets increase because a company asks money from banks to invest and buy plants, machineries, patents and so on. Therefore, the ATR decreases because it is an efficiency indicator and when a company is at the beginning of its investment strategy, it is very inefficient (input increases but output remains constant).

To sum up, if the debt-to-equity ratio is increasing, NPM most likely will decrease and ATR will decrease. However, it is not very clear what will happen to ROE. If a company has a healthy financial structure and its debt-to-equity ratio is below 3, by increasing bank debts, ROE might increase. However, if the debt-to-equity ratio goes beyond 3, we cannot predict what will happen to ROE so a company takes a risk by increasing bank debts.

It should be noted that we use leverage analysis approach for the next 12 months. It is a short-term oriented approach (a company is at the beginning of its business strategy).

Note: the threshold of debt-to-equity ratio is something general and the value of this ratio might vary industry by industry. For instance, ratio equal to 5 might be normal for one industry and very high for another.

Note: to identify if an investment strategy is successful or not, we should calculate and analyze each term of the formula for at least three years period.

Financial Analyst Approach to Leverage Analysis it's not very common

First, we investigate the theoretical approach that considers some assumptions for simplifying purposes. Therefore, this approach cannot applied for real cases, meaning it does not have practical applications considering the below assumptions.

$$ROE = f\left(\frac{D}{E}\right) \quad \text{where } D = \text{Total Liabilities}$$

Assumptions:

$$\text{Tax rate} = 0 \Rightarrow \text{Taxes} = 0$$

$$\text{Financial Income} = 0 \text{ (might happen in real life that it equal to 0 or small number)}$$

$$\text{Net Profit} = EBIT - I \text{ interest cost (Bank)}$$

$$ROE = \left(\frac{EBIT - I}{E}\right) \quad I = \text{financial cost}$$

$$ROE = EBIT * \left(1 - \frac{I}{EBIT}\right) * \left(\frac{1}{E}\right)$$

$$ROE = EBIT * \left(1 - \frac{1}{ICR}\right) * \left(\frac{1}{E}\right) * \left(\frac{\text{Assets}}{\text{Assets}}\right)$$

$$ROE = ROA * \left(1 - \frac{1}{ICR}\right) * \left(\frac{E + D}{E}\right)$$

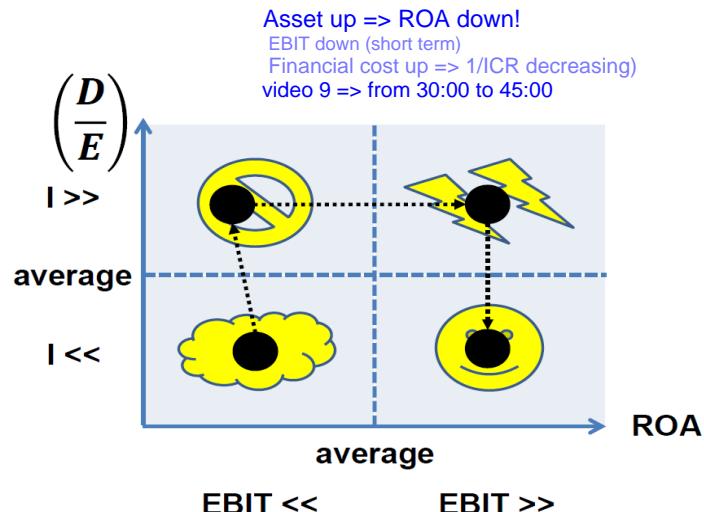
$$ROE = ROA * \left(1 - \frac{1}{ICR}\right) * \left(1 + \frac{D}{E}\right) \Rightarrow \text{Equity multiplier}$$

Risk/Operational Efficiency Matrix is the product of above formula. This matrix can be used to explain the financial leverage analysis.

There is a misleading interpretation of this formula that tell more you increase the equity multiplier more you increase the ROE.

Regarding ROA, assets increase because a company asks money from banks to invest and buy plants, machineries, patents and so on. In addition, EBIT might decrease because revenues in the short-term will likely remain as they are (because of time lag between investments and get returns) but operating cost increases a lot because there are more depreciation cost, labor cost, raw materials cost and so forth. Therefore, ROA in the short-term is decreasing.

From the below diagram, we can see that after making investments, the company move from foggy area towards ban area. In the short-term, revenues remain constant because the result of investments will appear after several years. In other words, EBIT decreases because revenues remain constant and at the same time, operating cost increases. Furthermore, assets are increasing. Therefore, the line between foggy and ban areas is deflected to the left.



Regarding ICR, financial costs are increasing because a company asks more money from banks. In addition, as it was mentioned above, EBIT is decreasing in the short-term. Therefore, ICR is decreasing, 1/ICR is increasing and $(1 - 1/ICR)$ is decreasing.

Finally, we can conclude that the first two elements of the formula is decreasing and the third one is increasing. However, it is not very clear what will happen to ROE.

Note: the above formula demonstrates the alignment between top managers and middle level managers. Top managers focus on return on equity and middle level managers try to improve return on assets. Therefore, in a way they are aiming at same result meeting the shareholders' expectations. Therefore, if a company wants to meet the shareholders' expectations, middle level managers must be able to generate enough EBIT.

Now we can try to alter assumptions in order to develop a formula that can be applied to real cases. Typically, the financial income is close to zero because companies are not expected to generate profit from financial investments.

$$ROE = f\left(\frac{D}{E}\right) \quad \text{where } D = \text{Total Liabilities}$$

Assumptions:

$$\text{Financial Interests} - \text{Financial Income} = \text{Net Financial Interests} = EBIT - EBT = I^*$$

$$\text{Net Profit} = EBIT - I^* - \text{Taxes}$$

$$ROE = \left(\frac{EBIT - I^* - \text{Taxes}}{E} \right)$$

$$ROE = EBIT * \left(1 - \frac{I^*}{EBIT} - \frac{\text{Taxes}}{EBIT} \right) * \left(\frac{1}{E} \right)$$

$$ROE = EBIT * \left(1 - \frac{1}{ICR^*} - \frac{\text{Taxes}}{EBIT} \right) * \left(\frac{1}{E} \right) * \left(\frac{\text{Assets}}{\text{Assets}} \right)$$

$$ROE = ROA * \left(1 - \frac{1}{ICR^*} - \frac{\text{Taxes}}{EBIT} \right) * \left(\frac{E + D}{E} \right)$$

$$ROE = ROA * \left(1 - \frac{1}{ICR^*} - \frac{\text{Taxes}}{EBIT} \right) * \left(1 + \frac{D}{E} \right) \Rightarrow \text{Equity multiplier}$$

The interpretation of this formula is the same as the theoretical one.

Theoretical Approach to Leverage Analysis

$$ROE = f \left(\frac{D}{E} \right) \quad \text{where } D = \text{Total Liabilities}$$

Assumptions:

$$\text{Financial Interests} - \text{Financial Income} = \text{Net Financial Interests} = EBIT - EBT = I^*$$

$$\text{Net Profit} = EBIT - I^* - \text{Taxes}$$

$$ROE = \left(\frac{EBIT - I^* - \text{Taxes}}{E} \right)$$

$$ROE = \left(\frac{EBT}{EBT} \right) * \left(\frac{EBIT - I^* - \text{Taxes}}{E} \right)$$

$$ROE = s * \frac{1}{E} * (EBIT - I^*) \quad \text{where } s = \text{impact of fiscal activities}$$

$$ROE = s * \frac{1}{E} * \left(EBIT * \left(\frac{\text{Assets}}{\text{Assets}} \right) - I^* * \left(\frac{D}{D} \right) \right)$$

$$ROE = s * \frac{1}{E} * (ROA * (E + D) - r * D) \quad \text{where } r = \text{average cost of debt}$$

$$ROE = s * \frac{1}{E} * (ROA * E + D * (ROA - r))$$

$$ROE = s * \left(ROA + \left(\frac{D}{E} \right) * (ROA - r) \right)$$

why important to academia => three different activities in a company:
 ROA => Operating activity
 R => Financial
 S => Fiscal

Note: in the above formula, r is not exactly equal to the average cost of debt because nominator should be financial interests but it is net financial interests. In addition, denominator

s is not commented=>

is given!!!! beyond the company control

should be just liabilities with explicit interest rate but it is total liabilities. Therefore, r approximates the real average cost of debt.

$$Average\ cost\ of\ debt = \frac{financial\ interests}{liabilities\ with\ explicit\ interest\ rate}$$

To interpret the above formula, we assume that tax rate is equal to zero so s becomes one. In this way, we can focus on the second part of formula.

Again, this formula demonstrates the alignment between top managers (ROE) and middle level managers (ROA). Also again, there is a misleading interpretation of this formula that tell more you increase the debt-to-equity more you increase the ROE. Of course, it might be true until the ROA is bigger than the average cost of debt (r) because after that the more you increase the debt-to-equity more you decrease the ROE.

Question: assume that $r=0.02$, $ROA=0.15$ and debt-to-equity ratio is equal to 1. What is your interpretations? First, r is not the real cost of debt. Therefore, we should consider the ratio between financial costs and financial liabilities instead of r because the value of real cost of debt is higher than r . Furthermore, in our analysis we should not just consider cost of debt but also cost of equity. In addition, it is better to consider ROI instead of ROA, because the value of ROI is higher than ROE. Furthermore, regarding debt-to-equity ratio, we can say that company does not have any idea about what to do with money; there is no project, there is no plan for investments and so on. Therefore, the company does not use the leverage meaning it does not ask for money from banks, bondholders and so on.

Discontinued operations refer to parts of a company's core business or product line that have been divested or shut down, and which are reported separately from continuing operations on the income statement. The total gain or loss from the discontinued operations is reported, followed by the relevant income taxes. This tax is often a future tax benefit because discontinued operations often incur losses. To determine the company's total net income (NI), the gain or loss from discontinued operations is aggregated with that of continuing operations.

Leverage Analysis: 3 coherent Perspectives

$$ROE = f\left(\frac{D}{E}\right) \quad \text{where } D = \text{Total Liabilities}$$

$$ROE = NPM * ATR * \left(1 + \frac{D}{E}\right)$$

$$ROE = ROA * (1 - ICR) * \left(1 + \frac{D}{E}\right) \quad \text{Under a few assumptions}$$

$$ROE = s * \left(ROA + \left(\frac{D}{E}\right) * (ROA - r)\right)$$

Short Exercises on Accounting-based Indicators

Exercise 1: You are trying to calculate ROE of Wind Ltd for 2018, but you do not have access to the complete Financial Statements. You were able to gather just the following information:

- Total Assets = 150 mln €
- Total Liabilities = 70 mln €
- Asset Turnover Ratio (ATR) = 2
- Effective tax rate = 35% (noise)
- CAPEX Coverage = 0.5 (noise)
- Net Profit Margin (NPM) = 10%

$$\text{Equity} = \text{Assets} - \text{Liabilities} = 150 - 70 = 80 \text{ mln€}$$

$$ATR = \frac{\text{Revenues}}{\text{Assets}} = \frac{\text{Revenues}}{150} = 2 \Rightarrow \text{Revenues} = 300 \text{ mln€}$$

$$NPM = \frac{\text{Net Profit}}{\text{Revenues}} = \frac{\text{Net Profit}}{300} = 0.1 \Rightarrow \text{Net Profit} = 30 \text{ mln€}$$

$$ROE = \frac{\text{Net Profit}}{\text{Equity}} = \frac{30}{80} = 37.5\%$$

Exercise 2: You are trying to calculate ROA for Company Alpha in 2019. You do not have access to the complete Financial Statements, but just to the following data:

- Total Assets = 150 mln€
- Total (Current and Non-Current) Liabilities = 80 mln€
- Asset Turnover Ratio (ATR) = 2
- Corporate tax rate = 35%
- Financial Revenues = 2 mln€
- Financial Expenses = 7 mln€
- ROE = 15%

$$\text{Equity} = \text{Assets} - \text{Liabilities} = 150 - 80 = 70 \text{ mln€}$$

$$ROE = \frac{\text{Net Profit}}{\text{Equity}} = \frac{\text{Net Profit}}{70} = 0.15 \Rightarrow \text{Net Profit} = 10.5 \text{ mln€}$$

$$\frac{\text{Net Profit}}{\text{EBT}} = \frac{10.5}{\text{EBT}} = 0.65 \Rightarrow \text{EBT} = 16.15 \text{ mln€}$$

$$EBIT = EBT + \text{Financial Expenses} - \text{Financial Revenues} = 16.15 + 7 - 2 = 21.15 \text{ mln€}$$

$$ROA = \frac{\text{EBIT}}{\text{Assets}} = 14.1\%$$

Exercise 3: assuming that only the balance sheet of the last fiscal year is available, which of the following accounting-based indicators can be computed?

- ROE, Net Working Capital, Quick Ratio
- ROE, Quick Ratio, ATR
- ROE, Current Ratio, CAPEX Coverage
- Net Working Capital, Days Sales Outstanding, Equity
- None of the above

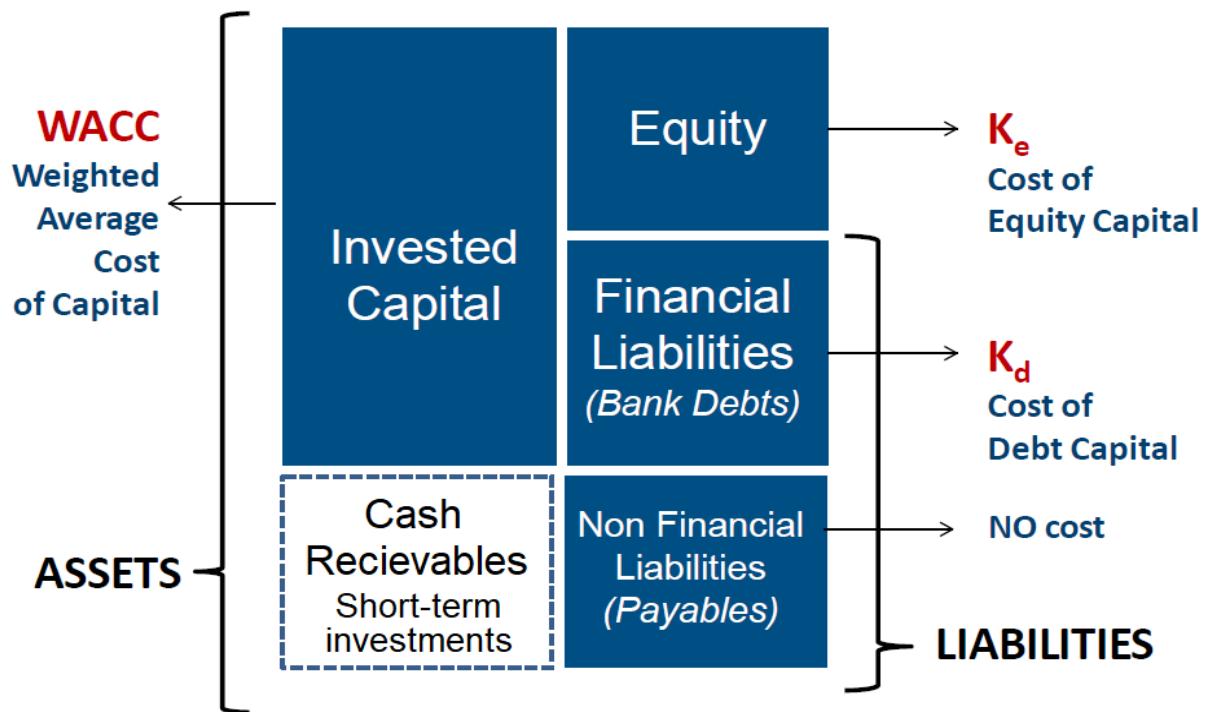
Note: Equity is a composition of three items, share capital, reserves and net profit.

net profit in equity section!

equity:

- share capital
- reserves
- net profit

Cost of Capital (corporate finance)



Equity is a composition of three items namely, share capital, reserves and net profit. In a mature company, share capital is a small portion of the equity and reserves are the big portion of the equity. The share capital is very important at the beginning for a company that recently was founded.

The equity is not for free meaning that shareholders expect a remuneration of the equity capital. K_e is the cost of equity capital and defined as the remuneration expected by the shareholders for the money they provided for the company.

The capital provided by stakeholders is also not for free meaning that stakeholders expect an interest rate. K_d is the cost of debt capital lent by stakeholders (banks and bondholders). The majority of this capital is from banks. K_d is a ratio between financial interests and financial liabilities (average cost of debt).

Since non-financial liabilities do not have an explicit interest rate, they do not have cost of capital.

As companies use the combination of shareholders' and stakeholders' money, another term called WACC was defined. Weighted average cost of capital (WACC) is the combination of cost of equity capital and cost of debt capital.

Weighted Average Cost of Capital – WACC

WACC is the Weighted Average Cost of Capital of the firm

$$WACC = K_e \left(\frac{E}{D + E} \right) + K_d (1 - t_c) \left(\frac{D}{D + E} \right)$$

K_e : cost of equity

K_d : cost of debt (pre tax)

t_c : corporate tax rate

$(1 - t_c)$: tax shield

$K_e >> WACC >> K_d \Rightarrow$ cost of debt is secured (time, guarantee), first to pay,

توی اینکام استیممنت
بالاتریها رو داریم زودتر
میدیم و کاست کنتری داره
برامون تا اکوییتی

E: shareholders' equity

D: debt (including only financial debt)

E + D = invested capital

$\frac{E}{D+E}$ = the percentage of the invested capital provided by the shareholders

$\frac{D}{D+E}$ = the percentage of the invested capital provided by the debtholders (banks)

$\frac{E}{D+E}$ and $\frac{D}{D+E}$ are used to balance between K_d and K_e

Note: K_d is always lower than K_e . In other words, the cost of equity exceeds the cost of debt because the risk to shareholders is greater than to debtholders since payment on a debt is required by law regardless of the company's profit margin. Thus, shareholders are risking with their money in the company because the remuneration is expected but not guaranteed. Another way to call K_e is the cost of risk capital.

Note: ROE can be considered as a proxy for K_e because the remuneration expected by shareholders (dividends) comes from net profit, which is obtained after subtracting the taxes. On the contrary, K_d is the ratio between financial interest and financial debts, therefore, it is connected to the financial interest, which is situated before taxes in the income statement. Thus, we can see that the two terms of the formula are not homogeneous because K_e is the cost of equity after taxes but K_d is the cost of debt before taxes. Therefore, the second part of the formula is multiplied the tax shield so that both terms become after taxes or homogenous.

Note: The higher the financial cost the lower the taxes because financial cost decrease the earnings before taxes. Therefore, the cost of debt is compensated by the reduction in taxes. The financial cost is a shield respect to taxes and reduce the financial pressure on the company. It is why $(1 - t_c)$ is called the tax shield.

Note: Another tax shield is related to depreciation. More the depreciation less the EBIT and less the taxes.

Cost of Equity – K_e

K_e is the cost of equity capital for an enterprise and defined as the remuneration expected by the shareholders. It is a priority for every top manager to meet this expectation and balance between long-term and short-term goals. In addition, every top manager strives to persuade the shareholders' assembly to reinvest and keep their money in the company for sustaining the growth. In this way, the top manager's focus moves from short-term goals to long-term goals.

K_e is how much an enterprise has to remunerate its shareholders for the risk they take by providing equity capital to the enterprise (risk of bankruptcy, performing lower than what was expected ...). K_e is the minimum expected return for shareholders. K_e is not contractually defined so the remuneration is expected but not guaranteed (maybe more than or less than what was expected).

K_e can be estimated through the CAPM (Capital Asset Pricing Model) method

$$K_e = r_f + \beta_L(r_m - r_f)$$

r_f = risk free rate

β_L = beta levered (equity beta)

r_m = market return

$(r_m - r_f)$ = market premium

how company is performing based on two side extreme, risk free and calculated market (how generally industry works)

Risk-free rate (r_f)

r_f is the theoretical return on an investment with no risk. With "no risk", we mean that:

- The investment is done in a condition of perfect information
- There is no uncertainty about what will happen in the future

Under these assumptions, does a risk-free investment exist? No

Can we identify a proxy for r_f ?

Government bonds are less risky than corporate bonds. It is a general assumption because for example there were some countries that faced bankruptcy. On the contrary, some companies are super safe for investment like Apple, Google, etc.

We select the return on the least risky government bond of the currency area of evaluation (where the company operates) in order to exclude any risk connected to the exchange rate.

In Eurozone the 10Y German Bond is used as a proxy of r_f . 10 years is assumed as a fair period that is enough for a country to fund the money and meet the obligations. 2 or 3 years are too short and 20 years is too long.

Market Return – r_m

r_m is the return on a theoretical market portfolio, which contains all the stocks in the market.

We can use a proxy...
– Market indexes that are representative of the market where the company operates

Market return (r_m)

r_m is the return on a theoretical market portfolio, which contains all the stocks in the market. The problem is that we do not have it so we can use a proxy: Market indexes that are representative of the market in which the company operates

Index	Country	Description
FTSE MIB	Italy	40 largest and most liquid Italian shares traded on Borsa Italiana
DAX	Germany	30 largest and most liquid German companies traded on the Frankfurt Exchange
CAC 40	France	40 largest and most liquid French companies traded on the Paris Bourse
FTSE 100	UK	100 largest and most liquid British companies traded on the London Stock Exchange
EUROSTOXX 50	Eurozone	50 largest and most liquid European companies traded on the Eurozone
S&P 500	US	500 largest and most liquid US companies traded on NYSE, AMEX or NASDAQ
DOW JONES	US	30 largest and most liquid US companies traded on NYSE
NASDAQ composite	US	3.000 largest and most liquid US companies traded on NASDAQ (IT companies)

Note: AMEX refers to small size companies with lower than three or five billion of market capitalization.

Example 1: You want to evaluate the K_e of a company operating only in Italy. Which r_f and market index would you use?

German 10Y government bond and FTSE MIB.

Note: operating in Italy means selling products in Italy.

Note: As the company sells products in Italy, shareholders think that the company should be able to generate value that is equal or align to the value generated by the Italian market.

Example 2: You want to evaluate the K_e of an Italian company operating only in Europe (Eurozone). Which r_f and market index would you use?

German 10Y government bond and EUROSTOXX 50.

Example 3: You want to evaluate the K_e of a Swedish company operating only in Europe (Eurozone). Which r_f and market index would you use?

Swedish 10Y government bond and EUROSTOXX 50.

Note: The theory is that r_f should be coherent with where the company is located (headquarter).

Example 4: You want to evaluate the K_e of an IT start-up company operating only in US. Which r_f and market index would you use?

American 10Y government bond and NASDAQ composite.

Example 5: You want to evaluate the K_e of a company operating 60% in Eurozone and 40% in US. Which market index would you use?

In this situation, we should use weighted average r_m considering EUROSTOXX 50 and S&P 500.

Contribution margin (price – variable cost) is the most accurate factor for determining the company operating portions in different areas but since we are searching for something that is fair enough, typically we use revenues.

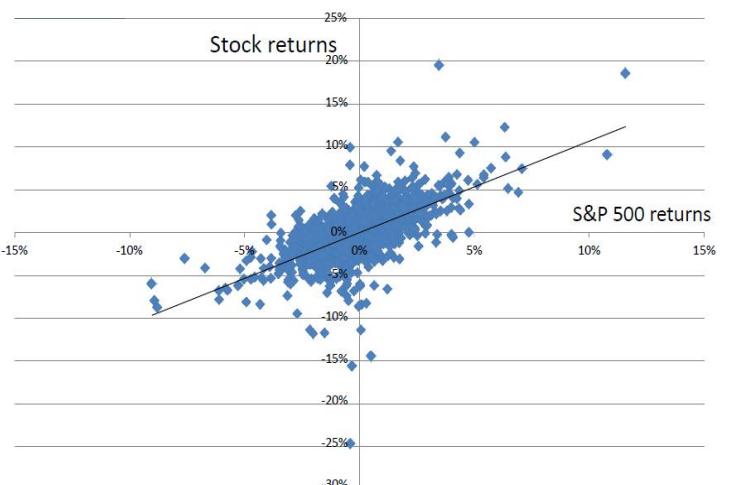
Beta levered (equity beta) - β_L

β_L is used to compare the capability of the investigating company respect to the market to generate value. In other words, β_L measures how volatile is the firm stock if compared to the overall market movements.

- $\beta_L > 1$ means that the stock is more volatile than the market (i.e. aggressive)
- $\beta_L = 1$ means that the stock is as volatile as the market
- $\beta_L < 1$ means that the stock is less volatile than the market (i.e. defensive)

The stock displayed below is aggressive, defensive or in line with the market?

Typically, to compare the capability of the investigating company respect to the market in generating value, we use market and company stock returns during last three years (about 750 days). In this example, we can see that the returns of the company under evaluation and the market is correlated. Therefore, the company is in line with the market $\beta_L = 1$.



Note: This comparison can only be done with the listed companies.

Note: if the company is **aggressive** it means when the market return is +5%, the company return is more than that (e.g. +6%, +7% ...) and when the market return is -5%, the company return is less than that (e.g. -6%, -7% ...).

Note: if the company is **defensive** it means when the market return is +5%, the company return is less than that (e.g. +4%, +3% ...) and when the market return is -5%, the company return is more than that (e.g. -4%, -3% ...).

Note: if $\beta_L = 1$, **cost of equity is equal to market return**. In other words, the remuneration expected by shareholders of the company is equal the market return.

Beta levered estimation

1. In case of a listed company:

It can be computed through a regression of the stock returns against the market returns.

2. In case of an unlisted company:

We cannot use the regression since the company does not have listed stocks

We have to infer the **unlevered beta (asset beta)**. We can follow two methods:

- Comparable companies
- Beta industry

Note: the first method should be preferred to the second one.

Why the returns of a company is different from the returns of the market? First reason refers to characteristics of the company (assets, business model ...). Second reason is connected to financial situation of the company in particular the financial leverage (the higher the leverage the riskier the company and the higher the expected remuneration by shareholders).

β_L and β_U comparison

β_L measures how volatile is a stock if compared to the overall market movements considering two factors simultaneously (assets and financial leverage):

- It depends on the capital structure of the firm
- Also known as "equity beta"

β_U measures how volatile is the underlying business, irrespective of the firm's capital structure. In other words, it aims at determining the capability of the company in generating value compare to the market considering only the characteristics of the company (assets) and not financial situation of the company (financial leverage – the ratio between the bank debts and equity).

- It depends on the industry/business of a firm but not on the capital structure of the firm!
- Also known as "asset beta" because it just refers to the assets of the company and not to how they are funded.

β_L estimation (comparable companies)

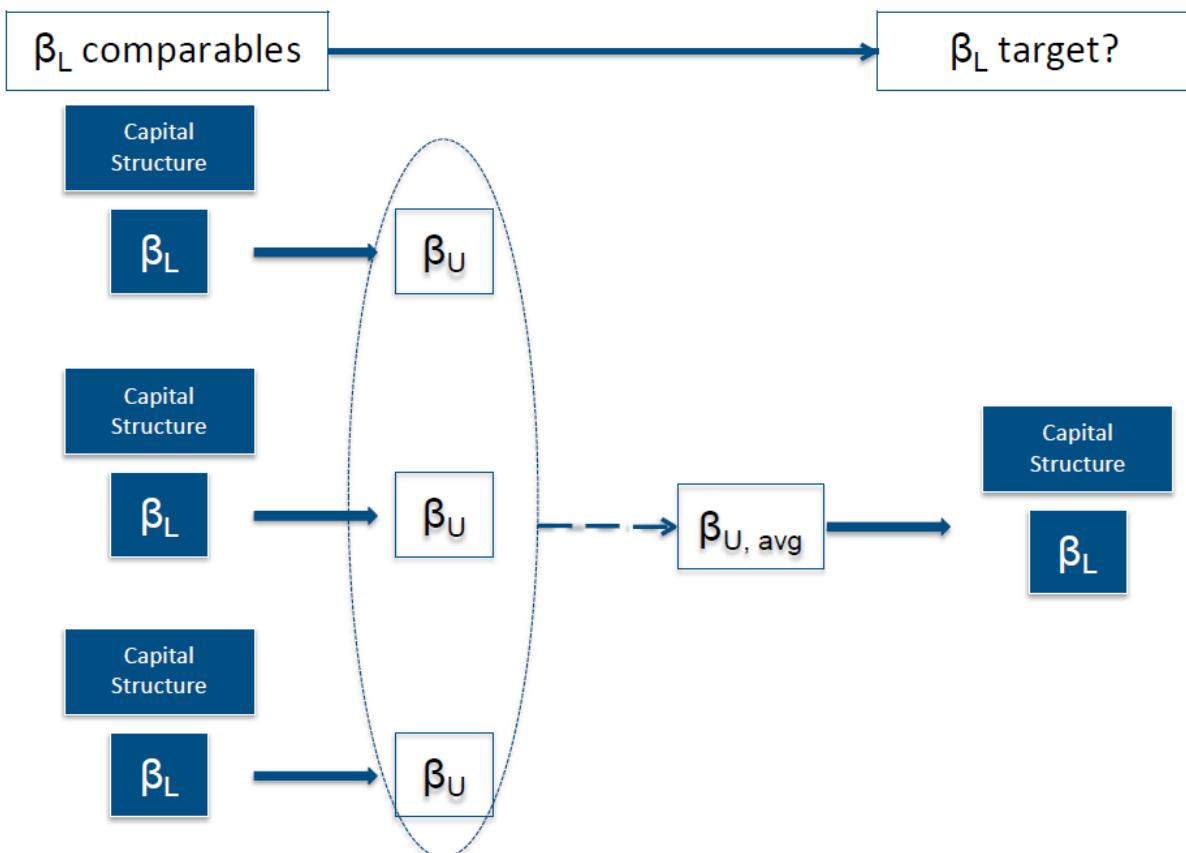
We should first identify a number of companies (typically three) that are comparable in terms of size, business model, assets, and strategies and so on. These companies are usually the competitors of the target company. In addition, they are listed in stock exchange. Therefore,

we can apply the regression analysis to estimate the beta levered for each of these companies. As mentioned before, beta levered is considering the effects of both financial leverage and assets. Therefore, we should eliminate the effects of financial leverage on β_L to obtain β_U of each company.

Why we should do this? Because the target company is very different from comparable companies in terms of financial structure particularly financial leverage. Consequently, we cannot directly use beta levered of comparable companies to obtain beta levered of the target company.

Since these companies are very similar, (same assets, business model, competitive advantages, size ...) and since we are excluding the financial side (leverage), we can assume that the asset betas are similar too. Therefore, the asset beta of the target company is similar to asset betas of comparable companies.

After this step, we compute the average of asset betas to increase the estimation accuracy of β_L for the investigating company. The asset beta of the target company is equal to the average of asset betas of comparable companies. Therefore, we can now add the financial structure effects of the target company to asset beta and obtain beta levered of the target company.



Summarizing

1. We take comparable companies for which we have β_L .
2. We compute the β_U of each comparable company (i.e. by stripping out the capital structure characteristics from β_L).

$$\beta_{U,comp} = \frac{\beta_{L,comp}}{\left(1 + (1 - t_{c,comp}) * \left(\frac{D_{comp}}{E_{comp}}\right)\right)} \quad D = \text{financial liabilities}$$

3. We compute the average beta $\beta_{U,avg}$ of the comparable companies.
4. We re-lever $\beta_{U,avg}$ the capital structure characteristics of the target company.

$$\beta_{L,target} = \beta_{U,avg} * \left(1 + (1 - t_{c,target}) * \left(\frac{D_{target}}{E_{target}} \right) \right)$$

Example: Alpha is a US-based company. You want to estimate its equity cost of capital and WACC. The company is not listed, but you have identified some comparable companies. You have also the Balance Sheet of Alpha whose main data are Equity = 650 mln\$, Financial Debt = 350 mln\$ (interest = 4%), tax rate 35%.

As for market indexes, the FTSE MIB is forecasted at 20% while S&P 500 is 14%. For risk free rates, refer to the next Table.

Comparable company	D (mln\$)	E (mln\$)	β_L	Corporate Tax rate
Comp 1	400	230	1.20	35%
Comp 2	700	400	1.10	32%
Comp 3	600	350	1.15	35%
Comp 4	500	290	1.00	32%

10Y Government Bond Yields	
AMERICAS	
United States	2.06%
Canada	1.91%
Mexico (\$)	3.19%
EUROPE	
Germany	0.78%
France	1.16%
Italy	2.45%

$$E = 650 \text{ mln\$} \quad D = 350 \text{ mln\$} \quad K_d = 4\% \quad t_c = 35\% \quad r_m = 14\% \quad r_f = 2.06\% \quad K_e = ? \quad K_e = r_f + \beta_L (r_m - r_f)$$

$$\beta_{U,comp} = \frac{\beta_{L,comp}}{\left(1 + (1 - t_{c,comp}) * \left(\frac{D_{comp}}{E_{comp}} \right) \right)}$$

Comparable company	D (mln\$)	E (mln\$)	β_L	t_c	D/E	β_U
Comparable 1	400	230	1.20	35%	1.74	0.56
Comparable 2	700	400	1.10	32%	1.75	0.50
Comparable 3	600	350	1.15	35%	1.71	0.54
Comparable 4	500	290	1.00	32%	1.72	0.46
AVERAGE						0.515

$$\beta_{L,alpha} = \beta_{U,avg} * \left(1 + (1 - t_{c,alpha}) * \left(\frac{D_{alpha}}{E_{alpha}} \right) \right) = 0.7$$

$$K_e = r_f + \beta_L (r_m - r_f) = 0.0206 + 0.7 * (0.14 - 0.0206) = 0.104 = 10.4\%$$

$$WACC = K_e \left(\frac{E}{D+E} \right) + K_d (1 - t_c) \left(\frac{D}{D+E} \right) = 7.67\%$$

β_L estimation (beta industry)

As second best as beta unlevered it could be used the one of the industry in which the company operates. This is not accurate as the first method because not all the companies in the industry are comparable to the target company. Therefore, the first method should be preferred to the second one.

Industry	Number of firms	Avg. Levered Beta	Avg. D/E	Avg. Tax rate	Unlevered Beta
Oil-Gas Distribution	12	1,02	53,4%	18,1%	0,71
Restaurant	65	1,16	13,2%	19,2%	1,05
Drug	223	1,08	14,8%	5,1%	0,94
Biotechnology	214	1,23	15,9%	3,0%	1,07
Internet	194	1,17	2,3%	8,4%	1,15
Entertainment	76	1,60	33,9%	12,6%	1,24
Bank	416	0,77	128,2%	16,4%	0,37
Steel	33	1,65	56,2%	24,2%	1,16
Automotive	12	1,73	103,4%	16,2%	0,93
Natural gas utility	27	0,46	66,2%	28,8%	0,31
Water utility	11	0,49	73,2%	31,5%	0,33

$$\beta_{L,target} = \beta_{U,industry} * \left(1 + (1 - t_{c,target}) * \left(\frac{D_{target}}{E_{target}} \right) \right)$$

Cost of debt – K_d

As we mentioned, K_d refers to the average cost of debt ratio, however, they are theoretically different. K_d might be seen as a rate that the bank defines at the beginning when negotiating with the company but the average cost of debt is the actual rate that at the end of the period, company pay the debtholders. However, in practice, they are assumed the same concepts so we might use K_d as the ratio between interest cost and financial liabilities.

- K_d is the cost of debt for an enterprise
- K_d is the interest that the enterprise has to pay on financial debts to remunerate the debtholders for the risk they take by providing debt capital to the enterprise. Risk refers to the possible incapability of the enterprise to meet the obligations and deadlines to pay debts and interest costs.
- K_d is the return for debtholders
- K_d is contractually defined

Average cost of debt is known at the beginning of the year because it is contractually defined. Therefore, there is no uncertainty about it. On the contrary, cost of equity will be known at the end of the period once the company does all the production, sales and collect the revenues from customers. Therefore, there is a time lag between these two that might be an explanation why the company is not using the leverage.

K_d can be computed as:

$$K_d = r_f + CDS$$

r_f : risk free rate

CDS: Credit Default Spread – CDS is associated with the enterprise credit rating

Credit Default Spread tell us how much we must increase the risk free rate because of the risk of bankruptcy of the company (missing the obligations and deadlines to pay debts and interest costs). The higher the CDS, the riskier the company.

Credit rating is an external evaluation performed by specific agencies or companies about the financial solidity of an enterprise. The more solid the financial situation of the enterprise, the

less the probability of bankruptcy and less the CDS. CDS is different company by company. We can now see why Altman's Z SCORE might be of interest to someone because it can be used in the rating system.

Example 1: Two companies are identical (same business, same size etc. – similar unlevered beta) but they have a different capital structure (different beta levered). While company A has D/E = 5, company B has D/E = 1. All other things being equal, which company has the riskier profile?

The answer is company A because it leverages more, which is also higher than the psychological threshold of three.

Example 2: Two companies are identical (same business, same size, same capital structure (means same leverage) etc.) but while company C has a liquidity shortage, company D has stable cash flows. All other things being equal, which company has the riskier profile?

Considering the lack of information, the answer is company C.

Credit rating is based on different parameters that are connected to the financial solidity of a company like leverage, liquidity and so on. Therefore, the credit default spread for an enterprise can be estimated using the "financial" characteristics of the firm. As first step, we can refer just to the interest coverage ratio, which is the most relevant, used parameter:

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest Expenses}}$$

Note: The debtholders (mostly banks) want to know how many times the company's EBIT can cover its financial costs. Both EBIT and interest expenses are accrual terms because they come from the income statement. Typically, there is no big difference between interest cost in the income statement and the cash out for interest because this activity is repeated year after year.

Note: We do not use EBITDA (proxy of the cash flow) or CFFO instead of EBIT because this number is the measure of efficiency and effectiveness (final results) of the company's strategy. The first translation of competitive advantages is the EBIT because some competitive advantages increase the company's revenues and others reduce the costs. Therefore, competitive advantages improve the EBIT and the combination of capabilities to increase revenues and decrease costs lead to EBIT. The superior performance over competitors is determined by the amount of EBIT (more specifically, ROI).

Therefore, the interest coverage ratio is the first thing that debtholders are looking at because it is the first reflection of the company's strategy. It should be noted that the role played by this ratio in the second approach of financial leverage analysis highlights its significance among financial analysts. In addition, it demonstrates the capability of the company to meet obligations and sustain its financial structure.

Generally, the higher the ICR, the better the company's performance. However, when it is so high, it may reflect that the company is not investing because the financial costs are too low. On the contrary, it may show that the company is investing a lot, and it has strong bargaining power with banks, which pushes financial costs down.

The larger the company, the higher the bargaining power with banks, suppliers, customers, government and so on. The strong bargaining power can help companies to find solutions to cash shortage.

Example:

Company	Operating income	Interest Expense	Interest coverage ratio
Disney	\$6,819	\$821	8.31
Aracruz	R\$ 574	R\$ 155	3.70
Tata Chemicals	INR 6,263	INR 1,215	5.15
Bookscape	\$3,575	\$575	6.22

Interest Coverage Ratio: Small market cap(<\$5 billion)	Interest Coverage Ratio: Large market cap (>US \$ 5 billion)	Rating	Typical Default
> 12.5	>8.5	AAA	1.25%
9.50–12.50	6.5–8.5	AA	1.75%
7.50–9.50	5.5–6.5	A+	2.25%
6.00–7.50	4.25– 5.5	A	2.50%
4.50–6.00	3– 4.25	A–	3.00%
4.00–4.50	2.5–3.0	BBB	3.50%
3.50–4.00	2.25–2.5	BB+	4.25%
3.00–3.50	2.0–2.25	BB	5.00%
2.50–3.00	1.75–2.0	B+	6.00%
2.00–2.50	1.5–1.75	B	7.25%
1.50–2.00	1.25–1.5	B–	8.50%
1.25–1.50	0.8–1.25	CCC	10.00%
0.80–1.25	0.65–0.8	CC	12.00%
0.50–0.80	0.2–0.65	C	15.00%
< 0.65	<0.2	D	20.00%

Enterprise	Market Cap	ICR	Rating
Disney	> \$ 5 billion	8.31	AA
Aracruz	< \$ 5 billion	3.70	BB+
Tata	< \$ 5 billion	5.15	A-
Bookscape	< \$ 5 billion	6.22	A

Instead of revenues or the number of full-time employees, market capitalization is used as a proxy of the size and bargaining power of the company because it also shows what the market is thinking about the company's financial health and its capability to generate value in the future.

For Tata Chemicals, we will use the synthetic rating of A-, but we also consider the fact that India faces default risk (and a spread of 3%).

$$K_d = r_f + \text{Country Spread} + \text{Company Spread}$$

Country spread is determined according to the country where the investigating company is operating.

Example 1: Company A is going to leverage more. What will happen to K_d ?

K_d is expected to increase because interest expenses are increasing, and as a result, ICR will decrease. In addition, the company leverage more to make investments to increase the scope of its operations. Therefore, tangible or intangible assets will increase and bring more D&A costs for the company. Consequently, in the short term, EBIT remains constant or may also decrease. Overall, ICR will decrease, thus increasing the CDS of the company.

Example 2: Company A is going to leverage more. What will happen to WACC?

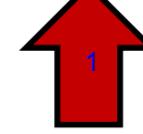
From the mathematical perspective, we do not know if the WACC increase, decrease, or remains constant. However, one can say WACC will increase because the company is going to leverage more and as a result become more risky.

Corporate tax rate will not change because it is defined by the government not the company.

leveraging = more debt =>

$$WACC = K_e \left(\frac{E}{D+E} \right) + K_d (1-t_c) \left(\frac{D}{D+E} \right)$$

debt up => risk up => K_e up


risky!



$k_e > k_d$

$$k_d = r_f + CDS(ICR)$$

increase while debt increase

$$\beta_{L,A} = \beta_{U,avg} * \left(1 + (1 - t_{c,A}) * \left(\frac{D_A}{E_A} \right) \right)$$

10th => 2:30:00 about Iuiviton strategy!
they issue bonds! great reputation and
keep same the K_d

Exercises => 10.2 AFC_Cost of capital_exercises

6 score

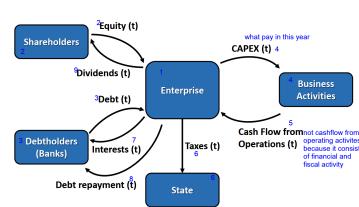
Enterprise Value and Equity Value

Eq. V. = financial value of the company

Top and middle-line managers should always try to maximize both the enterprise and equity value, which is the final goal of all companies. In theory, it is considered the main objective of for-profit organizations; however, the professor's opinion is that it should also be true for non-profit organizations.

What goal for an enterprise?

$$\max ROE = \frac{\text{Net Profit}}{\text{Equity}}$$



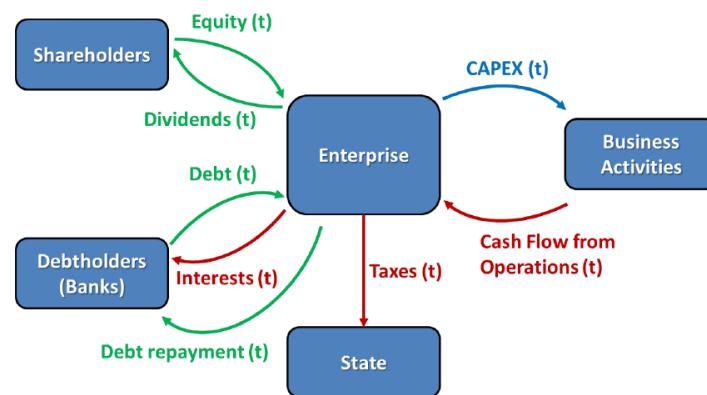
Net profit is an accrual indicator. A company cannot pay salaries, suppliers, etc. and buy new assets with profit to pursue its strategy... it needs cash.... Revenue is vanity, profit is sanity and cash is reality. Therefore, maximizing of the ROE is not enough to say that the company is growing well or might grow well in the future.

$\max \text{Cash Flow from Operating Activities}$

One year is not enough; we must look at the long-term. This translates strategy into value; the final goal of any strategy is to maximize enterprise and equity value.

The Cash Generation Cycle

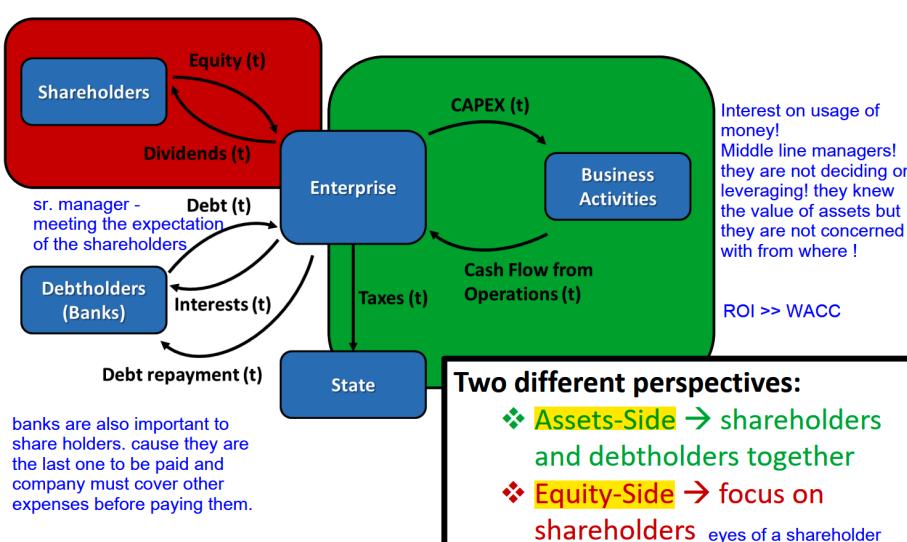
A company uses shareholders and debtholders' money to buy new tangible and intangible assets in order to improve business activities and their capability to run the business. Consequently, company can generate cash from operations.



Accounting

CASH FLOW STATEMENT	
Cash at the beginning of the year	
+ Cash Flow from Operating Activities	+ OPENING CASH
+ Cash Flow from Investment Activities	+ CASH FLOW FROM THE OPERATING ACTIVITIES
+ Cash Flow from Financing Activities	+ CASH FLOW FROM THE INVESTING ACTIVITIES
= Cash at the end of the year	+ CASH FLOW FROM THE FINANCING ACTIVITIES
	+ CASH AT THE END

The following figure shows the capability of the company to generate value (cash) in the long-term from two different perspectives (related). The concept of value is related to the cash.



The asset-side perspective demonstrates the capability of a company to generate cash over time with the available resources without knowing who fund these resources (invested capital). It is the perspective of middle-line managers (they are responsible for using assets to generate value or cash). The main assumption is that shareholders and debtholders are a unique entity, and they are not distinguished because we only look at the problem from the asset side and do not care about the composition of equity and liabilities. In other words, in this perspective, understanding the composition of assets and what they are producing matters. Moreover, using this perspective we do not know if the company is able to pay back banks or distribute dividends to shareholders.

The equity-side perspective focuses on shareholders. It is the perspective of top managers. The enterprise value is the main result of the asset-side perspective, while the equity value is the main result of the equity-side perspective.

Enterprise Value EV (Assets-Side)

Cash generation (t) = ?

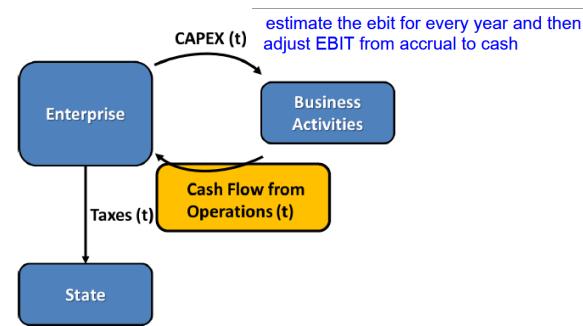
for checking the cash generation of a company, we need to start from the **STRATEGY**. First real result of the strategy is EBIT. estimate EBIT => Adjust Ebit

We start from EBIT (t) because when forecasting the future

- We translate strategy and competitive advantages in expected revenues vs operating costs (the EBIT allows us to measure the quality and effectiveness of a company's strategy based on competitive advantages – it is the first result of the strategy)
- We adjust them in expected cash inflows vs cash outflows since revenues are not cash inflows and costs are not cash outflows.

1. EBIT (t) underestimates cash generation (or overestimates cash outflows) because it considers D&A among operating costs even if they do not generate cash outflows (it is not a monetary cost). In this view, we must adjust *EBIT (t)* by readding *D&A (t)* (*EBITDA*). Now it is clear why EBITDA is the best proxy of cash generation.

In the income statement we consider D&A as a expense while in the cash flow statement we consider capital expenditures, which is related to purchasing assets (whether in a single payment or installments)



Note: Money spent on CAPEX purchases is treated as an asset on the balance sheet, and depreciation expense is deducted from that asset over several years, beginning the year following the date on which the item is purchased. Every year in which this depreciation expense is reported on the income statement effectively reduces a company's profit.

2. Since EBIT (t) considers Revenues (t), to translate revenues in cash inflows we must consider receivables

$$\text{Cash inflows (t)} = \text{Revenues (t)} - \text{Receivables (t)} + \text{Receivables (t - 1)}$$

Assuming that the DSO of a company is 3 months, the receivables of the last three months of the fiscal year will not lead to cash generation in that year but will be received in the next year. Therefore, for calculating the cash inflows of the next year (*t*) we have to add the receivables of the previous year (*t - 1*) to *Revenues (t)* and then deduct the receivables of the same year.

3. Since EBIT (t) considers COGS (t), to translate costs in cash outflows we must consider inventories. In other words, EBIT underestimates (or maybe overestimates the cash outflows) because it does not consider the variation of inventories.

$$\text{Cash outflows (t)} = \text{COGS (t)} + \text{Inventories (t)} - \text{Inventories (t-1)}$$

The income statement is just considering the COGS because of the matching principle, which is the basis for stating and drafting the income statement. In other words, only the costs connected to revenues will be recognized in the income statement. However, moving from accrual to the cash logic, we must also consider the cash outflows connected to the variation of inventories. Considering the raw materials, the income statement only considers the costs of materials used for products sold, while it does not consider the costs of materials that are still in the company and stocked in warehouses. On the contrary, the cash flow statement considers that the company also paid for these materials (purchases), thus recognizing the cash outflows of inventories. Considering that the company might sell the inventories of the previous year, those inventories should be deducted from COGS (t) because the company already paid for them in the last year. Therefore, they are not causing any cash outflow in the current year.

4. To translate costs in cash outflows we must consider payables.

$$\text{Cash outflows (t)} = \text{Costs} - \text{Payables (t)} + \text{Payables (t-1)}$$

Assuming that the DPO of a company is 3 months, the payables of the last three months of the fiscal year will not lead to cash outflow in that year but will be due in the next year. Therefore, for calculating the cash outflows of the next year (t) we have to add the payables of the previous year (t-1) to costs and then deduct the payables of the same year.

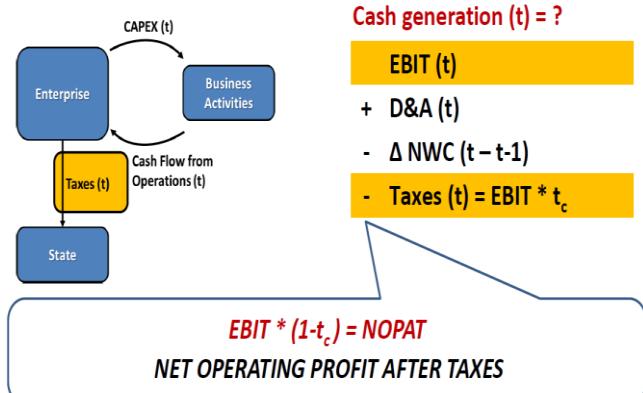
$$\begin{aligned} \text{NOWC (t)} &= \text{Receivables (t)} + \text{Inventories (t)} - \text{Payables (t)} \\ \rightarrow -\text{NOWC (t)} + \text{NOWC (t-1)} &= -\Delta \text{NOWC (t-t-1)} \end{aligned} \quad \Rightarrow \quad \begin{array}{l} \text{Cash generation (t)} = ? \\ \text{EBIT (t)} \\ + \text{D&A (t)} \\ - [\text{Receiv (t)} - \text{Receiv (t-1)}] \\ - [\text{Invent (t)} - \text{Invent (t-1)}] \\ + [\text{Payab (t)} - \text{Payab (t-1)}] \end{array}$$

cashflow from operation: (Adjusting the EBIT)

1:59:00 (11)

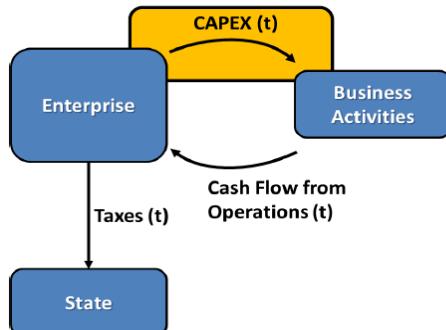
Note: The above term is the result of adjustments in revenues and costs and transformation of them into cash inflows and cash outflows.

5. Taxes are computed directly on **EBIT** (not on **EBT**) because shareholders (the company) and debtholders are assumed as a single entity (in the asset-side perspective) and thus financial costs are assumed as an “internal flow” that does not act as a tax shield. In other words, debt repayment and interest payments lead to cash inflows for banks and cash outflows for the company but the sum of them are zero. Therefore, the EBIT is the result of both the company and banks and they working together to generate value.



relocate the value chain to decrease the tax and this can be a mandate of middle line managers

6.



Cash generation (t) = ?

$$\begin{aligned}
 & \text{EBIT (t)} \\
 & + \text{D&A (t)} \\
 & - \Delta \text{NWC (t - t-1)} \\
 & - \text{Taxes (t)} = \text{EBIT} * t_c \\
 & - \text{CAPEX (t)}
 \end{aligned}$$

*In case of DISPOSAL of Assets, we must consider
Net CAPEX = CAPEX (t) - Disposals (t)*

The disposal of assets means that the company is selling some assets, which happens rarely.

Finally, after considering all the elements we obtain **free cash flow to firm (FCFF)**

cash available for company, free means it's net.
this is not available to shareholders!

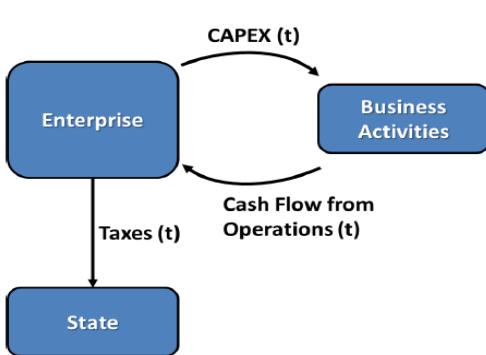
$$\text{EBIT (t)} + \text{D&A (t)} - \Delta \text{NWC (t - (t - 1))} - \text{EBIT (t)} * t_c - \text{CAPEX (t)} = \text{FCFF (t)}$$

FCFF is **the cash that is generated by the company** and is available (for both shareholders and debtholders) to be used by the company for other activities (surplus cash). Other activities refer to interest payments, dividends or reinvestment in the business. This indicator is the result of the initial assumption that the banks and shareholders are one unique entity (asset-side perspective).

Usually, FCFF is more than zero; however, it could be lower than zero because of the significant installments connected with investments (CAPEX). Therefore, the company might not be able to generate positive FCFF in the short-term, thus considering the sum of FCFFs over the long-term is a better way to calculate enterprise value. However, the value of money changes over time, so we need to discount and make it homogeneous (with the WACC).

The reason why we use WACC for discounting is connected to the asset-side perspective. In other words, the company uses resources (invested capital) that are funded by both shareholders and debtholders.

EV measures the capability of an enterprise to generate cash over time, which its maximization is the ultimate goal for any middle-line manager.



$$FCFF(t) > 0$$

**One year does not make sense
→ Long-term**

$$\sum_{t=1}^{\infty} FCF(t) > 0$$

**The value of “money” changes
over time → Discounting**

$$EV = \sum_{t=1}^{\infty} \frac{FCFF(t)}{(1 + WACC)^t}$$

$$\sum_{t=1}^{\infty} \frac{FCFF(t)}{(1 + WACC)^t} > 0$$

Note: The term “assets” in the assets-side perspective does not refer to total assets of the balance sheet but refer to invested capital.

Note: In the calculation of FCFF, we do not consider financing activities. Instead, we consider investing and operating activities. Here, operating activities refers to cash flow from operations, which does not consider financial and fiscal activities. The latter one included in the calculations separately. Therefore, in the asset-side perspective, we do not take into account any cash inflow or cash outflow connected to the financial and financing activities.

Note: Since the debtholders and shareholders are considered a single entity, financial cost is an internal flow between banks and the company. It is a cost for the company and an income for the bank. Therefore, the financial costs reduce taxes for the company while increasing taxes for the bank. Consequently, taxes are computed directly on EBIT and not on EBT. For better understanding, we can assume that the bank is a subsidiary of the company and financial costs are intra-group transactions, so they should be excluded.

Using the above formula is not easy because the concept of the infinitive is very critical to manage. Therefore, we divide the period from 1 to ∞ into two subperiods. The first one is the analytical forecast period, a time horizon in which the company can draft financial reports and forecast each of the elements (EBIT, inventories ...) for the calculation of FCFF.

The reference number for T is very different company by company. T is usually from three to five years for young companies like startups. For more mature enterprises, the typical reference number for T is ten years. In very stable industries, it can be increased to twenty years.

Terminal value (TV) refers to the value that a company is able to generate in the period after T, during which the company is not capable anymore of providing and drafting reliable financial reports. In other words, it is a single measure of all the values generated by the company after T, when the company is in the year T (because it is discounted based on year T). Therefore, we multiply the terminal value with another term to calculate the present value and make the formula homogeneous.

$$EV = \sum_{t=1}^{\infty} \frac{FCFF(t)}{(1 + WACC)^t}$$

$$\sum_{t=1}^T \frac{FCFF(t)}{(1 + WACC)^t} + \sum_{t=T+1}^{\infty} \frac{FCFF(t)}{(1 + WACC)^t}$$

$$\sum_{t=1}^T \frac{FCFF(t)}{(1 + WACC)^t} + \frac{1}{(1 + WACC)^T} * \sum_{t=T+1}^{\infty} \frac{FCFF(t)}{(1 + WACC)^{t-T}}$$

$$\sum_{t=1}^T \frac{FCFF(t)}{(1 + WACC)^t} + \frac{TV(T)}{(1 + WACC)^T}$$

Terminal Value TV

enterprise value that ent. can generate after T
because of npv, unifying the value!

How to manage TV?

1. $TV = 0 \Rightarrow$ After year T, the company is not able anymore to generate value. This choice makes sense when T is long enough because denominator of TV become a large number. Therefore, any cash flow that will be generated so far in time will be close to zero today.

This approach does not work for startups because we cannot say they can no longer generate value after three to five years.

$$2. FCFF(t) = FCFF(T) \quad \text{when } t > T$$

$$TV(T) = \frac{FCFF(T)}{WACC}$$

Assuming that in the year T, the company will become mature, all of its strategies will be implemented successfully, and finally, reach a stable condition. Therefore, after year T, FCFF will remain constant as the previous year. With this assumption, everything will be frozen after the analytical forecast period (even the competitors' performance).

$$3. FCFF(t + 1) = FCFF(t) * (1 + g) \quad \text{when } t > T$$

$$TV(T) = \frac{FCFF(T)*(1+g)}{WACC-g}$$

$$g = \text{yearly growth rate}$$

Assuming that the company will not reach a stable condition before year T and FCFF is still growing after year T, it will still benefit from implementing company's strategies. Typically, the growth rate is 2 or 3 percent.

Note: the best approach is different case by case. However, professor suggest the first one as the best approach for mature companies and the second one for startups. It is difficult to determine g in the third approach. Moreover, this approach is not reliable because customers' taste change over time, competitors react to company's strategies, and unexpected events may happen. Therefore, it make no sense to claim that the company will grow over time.

Note: Typically, consultancy firms use both the first and second approaches to obtain a range for TV. The correct result is somewhere located in this range.

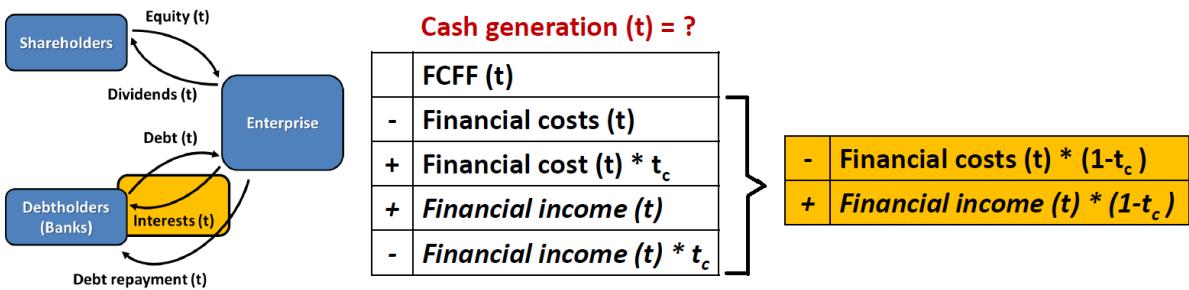
Note: The most complex part for calculating the EV and drafting financial statements is the translation of competitive advantages in revenues and costs.

Equity Value (Equity-Side)

It is the measurement of value generated by a company for shareholders. The equity value is the perspective of shareholders and top managers. Here, we do not consider shareholders and debtholders as a single entity. Therefore, we need to take into account the cash flows between the company and debtholders in order to focus on shareholders.

The asset-side perspective demonstrates the capability of a company to generate cash over time with the available resources without knowing who funds these resources (invested capital). However, this is not enough for the shareholders because they want to know the capability of the company to generate cash (value) over time, which is just available for them. In other words, it does not make sense for shareholders to be assumed as a single entity together with debtholders. For instance, it might be the case that the EV is very positive, but all the generated cash will be for banks, and nothing will be left for the shareholders.

1. $FCFF(t)$ must be adjusted taking into account financial activities (financial costs and financial income) and the variation of taxes.



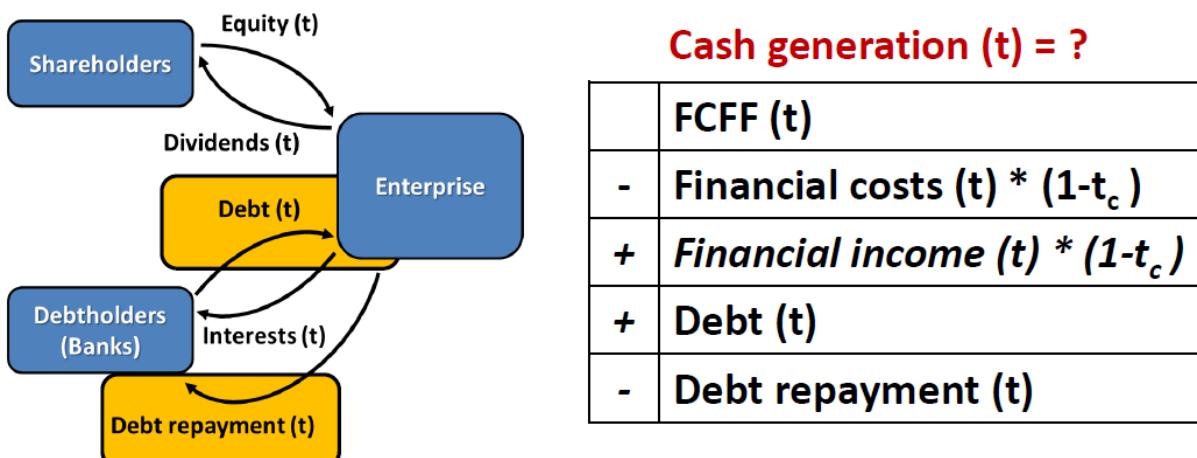
Financial costs are the cash outflows. In other words, since we are projecting the future, we do not consider a delay between the accrual and cash logic. More in detail, we assume that the amount of financial costs in the income statement (accrual logic) are the same as the payments of financial costs in the cash flow statement (cash logic).

The company might also have some financial income (cash inflow). In many cases, the financial income is not present in the calculation of equity value because the value generated by the core business of the company is at the center of analysis. Moreover, it is so difficult to project the financial income (resulted from financial investments – shares and bonds) over time. Therefore, most of the time it is equal to zero.

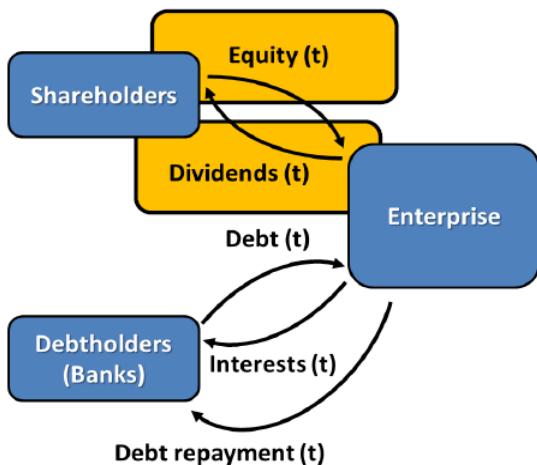
We consider taxes on financial costs and income because, in the calculation of FCFF, the taxes are computed directly on EBIT. In other words, we neglect the tax shield; that is, the company can reduce the taxes by paying the financial costs. Therefore, we need to adjust the taxes because the cash outflows connected to taxes in the FCFF are overestimated. Of course, if financial income were higher than financial costs (rarely happens), taxes in the FCFF would be underestimated.

It should be noted that the taxes are assumed to be paid at the end of the year. However, it is not true because the shareholders assembly should first approve the financial reports (in April or May of the next year), then the taxes will be paid.

2. *FCFF (t)* must be adjusted taking into account the collection of *new debts (t)* and the repayment of *current debts (t)*.



3. *FCFF (t)* must be adjusted taking into account the collection of *Equity (t)* and the payment of *dividends (t)*. On the one hand, the company might issue new shares (new share capital) and collect additional money from shareholders (cash inflow). On the other hand, the company should distribute dividends to shareholders (cash outflow).



$$E = \sum_{t=1}^{\infty} \frac{FCFE(t)}{(1 + ke)^t}$$

Cash generation (t) = ?

FCFF (t) cash generated available from enterprise

- **Financial costs (t) * (1-t_c)**
- + **Financial income (t) * (1-t_c)**
- + **Debt (t)**
- **Debt repayment (t)**
- + **Share capital (t)**
- **Dividends (t)**
- = **FCFE (t)** free cash flow to equity available to shareholders increase dividends, reinvest

By considering share capital and dividends, we conclude Free Cash Flow to Equity (FCFE), which is the cash available to shareholders after dealing with debtholders (interest costs and debt repayments) and shareholders (dividends and share capital). However, many believe that these two terms (dividends and share capital) should be excluded from the computation of FCFE and obtain the cash available to shareholders after dealing only with debtholders.

The reason why we use k_e for discounting is that here the perspective used is the **shareholders perspective**.

$$\sum_{t=1}^T \frac{FCFE(t)}{(1 + ke)^t} + \frac{TV(T)}{(1 + ke)^T}$$

How to manage TV?

1. $TV = 0 \rightarrow$ This choice makes sense when T is long enough

2. $FCFE(t) = FCFE(T)$ $TV(T) = \frac{FCFE(T)}{k_e}$
when $t > T$

3. $FCFE(t+1) = FCFE(t) * (1+g)$ $TV(T) = \frac{FCFE(T) * (1+g)}{k_e - g}$
when $t > T$

$g =$ yearly growth rate

Short case study

You want to evaluate the Equity Value of the company Sama. You have just estimated the company P&L for next 3 years (analytical forecast period) in Table 1. Furthermore, you know that the company will do capital expenditures in 2015 (25 million €), 2016 (33 million €) and 2017 (36 million €). There will be changes in the financial structure (Table 2). Cost of equity will be 14% (2015), 14.2% (2016), and 15.4% (2017). Finally, you have prospects of the NOWC for the next 3 years (Table 3). After the period of analytical forecast, the FCFE are supposed to increase infinitely ($g = 3\%$).

TABLE 1 P&L (data in mln euros)	ESTIMATIONS			TABLE 2 Balance Sheet (data in mln euros)	ESTIMATIONS		
	2014	2015	2016		2014	2015	2016
Revenue	235,0	210,0	230,0	240,0	Debt	112	102
Operating cost (OpEx)	-102,0	-95,0	-125,0	-104,0	Shareholders Equity	54	62
EBITDA	133,0	115,0	105,0	136,0	Total equity and liabilities	166	164
D&A	-21,0	-23,0	-29,0	-31,0			175
EBIT	112,0	92,0	76,0	105,0			182
Financial revenues/expenses	-10,0	9,0	-10,0	-12,0			
EBT	102,0	101,0	66,0	93,0			
Income tax expenses	-35,7	-35,4	-23,1	-32,6			
Profit for the year	66,3	65,7	42,9	60,5			
net financial cost							

TABLE 3 (data in mln euros)	ESTIMATIONS			
	2014	2015	2016	2017
Accounts Receivable	64	64	64	64
Inventories	33	35	40	44
Accounts Payable	35	41	39	41

Note: cost of capital should be calculated for each year because it will not remain constant. Even if the company does not change the financial structure (e.g. leverage more ...), equity will increase because of the increase in reserves, so WACC will increase too.

		2015
	EBIT (t)	92
+	D&A (t)	+23
-	Δ NWC (t - t-1)	+4
-	Taxes (t) = EBIT * t_c	-32,2
-	CAPEX (t) - net capex	-25
=	FCFF (t)	61.8
-	Net Interests (t) * (1 - t_c)	+5.9
±	Debt (t)	-10
+	Share Capital (t)	0
-	Dividends (t)	0
=	FCFE (t)	57.7

$$\left. \begin{array}{l} \text{Rec(t)} - \text{Rec(t-1)} = 64 - 64 \\ \text{Inv(t)} - \text{Inv(t-1)} = 35 - 33 \\ - \text{Pay(t)} + \text{Pay(t-1)} = -41 + 35 \end{array} \right\}$$

$$\left. \begin{array}{l} t_c = \text{taxes/EBT} = 35.4/101 = 35\% \\ \text{taxes} = 35\% * 92 = -32.2 \end{array} \right\}$$

$$\text{Net interests} = -9 * (1 - 35\%) = -5.9$$

Note: in the written exam, payout ratio (if presented) can be used to calculate the dividends to the shareholders.

		2015	2016	2017
	EBIT (t)	92	76	105
+	D&A (t)	+23	+29	+31
-	$\Delta \text{NWC} (t - t-1)$	+4	-7	-2
-	Taxes (t) = EBIT * t_c	-32,2	-26.6	-36.8
-	CAPEX (t)	-25	-33	-36
=	FCFF (t)	61.8	38.4	61.3
-	Net Interests (t)* $(1-t_c)$	+5.9	-6.5	-7.8
±	Debt (t)	-10	+8	+11
+	Share Capital (t)	0	0	0
-	Dividends (t)	0	0	0
=	FCFE (t)	57.7	39.9	64.5

	2015	2016	2017
FCFE (t)	57.7	39.9	64.5
$K_e (t)$	14.0%	14.2%	15.4%

$$\sum_{t=1}^T \frac{FCFE(t)}{(1+ke)^t} + \frac{TV(T)}{(1+ke)^T}$$

$$TV(T) = \frac{FCFE(T) * (1+g)}{k_e - g}$$

$$TV(3) = \frac{64.5 * (1+3\%)}{15.4\% - 3\%} = 534.4$$

$$E = \frac{57.7}{(1+14\%)^1} + \frac{39.9}{(1+14.2\%)^2} + \frac{64.5}{(1+15.4\%)^3} + \frac{534.4}{(1+15.4\%)^3} = 470.6 \text{ mln €}$$

It is the present value of all cash that the company will generate for shareholders. This value is the proxy of market capitalization of the company.

Who can carry out the calculation of either EV or E? The most correct answer based on the professor's opinion is subjects who are INSIDE the enterprise (e.g., CEO, CFO, C-levels, etc.). The first reason is that typically the managers inside the company use these techniques. The second explanation is that you can only apply these measures once you are able to draft the financial reports for the future. We use an analytical approach to calculate E and EV, which needs drafting financial reports for the next years. Only people inside the company are aware of the company's strategies and plans. People outside the company (financial analyst, AFC professors, etc.) cannot produce the financial reports for next years because they have no idea about what the company is going to do in the future (e.g., next ten years). However, people outside the company can use relative valuation approach to estimate EV and E (it is the typical method used by financial analyst). In this approach, there is no need to produce financial statements.

Relative Valuation

Relative valuation is used to assess the value of an asset or a company using indirect method. It is trying to show the value of any type of company and any type of asset through the value of other comparable companies and assets, respectively. The problem with this method is data availability. In other words, we need to have all the explicit data in order to make a correct calculation of the value of a company or an asset.

For instance, company A decides to acquire company B that is not listed (it did not go through the IPO process). There is a book value for this company based on its balance sheet but what would be the real value that company A should pay for company B? In this situation, relative valuation method can be used to identify the value of company B.

In relative valuation, the value of an asset is compared to the values assessed by the market for similar or comparable assets. Relative valuation is widely used to estimate the company value. It compares the (target) company with other similar listed ones.

Relative valuation method does not try to determine a company intrinsic worth based on its estimated future free cash flows discounted to their present value. Instead, it determines a company's value based on the market observation, by comparing a firm value to that of its comparables.

Relative Valuation is pervasive:

- Most valuations on Wall Street are relative valuations
- Almost 85% of equity research reports are based upon multiples and comparables
- More than 50% of all acquisition valuations are based upon multiples
- Rules of thumb based on multiples are often the basis for final valuation judgments

It does not mean that the relative valuation is the only method that should be used but it means that it is much easier to be applied and for a financial analyst using this method speed the valuation process (however, it might be less precise).

Relative Valuation: main steps

1. Defining comparable companies

A comparable firm is the one with cash flows, growth potential, and risk similar to the firm being valued. It would be ideal if we could value a firm by looking at how an identical firm - in terms of risk, growth and cash flows - is priced. Nowhere in this definition is there a component that relates to the industry or sector to which a firm belongs. Thus, a telecommunications firm can be compared to a software firm, if the two are identical in terms of cash flows, growth and risk. A comparable company does not have to be a competitor but a company with certain characteristics that are similar to the target one.

In most analyses, however, analysts define comparable firms to be other firms in the firm's business or businesses. The implicit assumption being made here is that firms in the same sector have similar risk, growth, and cash flow profiles and therefore can be compared with much more legitimacy.

The identification of comparable companies is one of the most difficult tasks of this approach to valuation.

- Identify first the target company value drivers
- Identify those companies with the same value drivers
- Define companies' specificities:

Risk: risk rating

Growth: horizontal of sales, asset (big and growing) has impact on enterprise value

Cash flow => generating operating cashflow

- Sector
- Geographical market (where they sell their products)
- Presence of divisional structure
- Size (assets or sales)
- Presence of comparative advantages
- Innovation/development models
- (accounting principles)

In the context of valuing equity in firms, the problems [of finding comparable assets or companies] are compounded since firms in the same business can still differ on risk, growth potential and cash flows.

Example: comparable companies for Fincantieri:

SHIPBUILDING			OFFSHORE	EQUIPMENT, SYSTEMS & SERVICES
Revenues ⁽¹⁾ (% on total)	Cruise €1,075 MM (28%)	Naval €1,126 MM (29%)	Others €193 MM (5%)	€1,321 MM (34%)
End markets	Leisure 	Defence 	Transportation / Luxury / Maintenance 	Oil & Gas
Main products / Services	<ul style="list-style-type: none"> All cruise ships (from contemporary to luxury) 	<ul style="list-style-type: none"> All surface vessels (also stealth) Support & Special vessels Submarines 	<ul style="list-style-type: none"> High tech ferries Large mega-yachts Ship repair & conversion services 	<ul style="list-style-type: none"> Offshore Support Vessels (AHTSs, PSVs, OSCVs) Specialized vessels Drillships
Positioning	<ul style="list-style-type: none"> #1 worldwide (~50% market share⁽²⁾) 	<ul style="list-style-type: none"> Global leader: <ul style="list-style-type: none"> #1 in Italy⁽³⁾ Key supplier for US Navy & Coast Guard⁽⁴⁾ Worldwide exporter (India, UAE, other) 	<ul style="list-style-type: none"> Global leader in: <ul style="list-style-type: none"> High tech ferries (21% market share⁽⁵⁾) Large mega-yachts Repair & conversion 	<ul style="list-style-type: none"> Global leader in high-end OSVs⁽⁶⁾ (20% market share⁽⁷⁾)
Backlog	€5,345 MM			€2,480 MM
				€264 MM

When it is difficult to find comparables for a big company (e.g. Fincantieri), we move from aggregate analysis to segment analysis. Therefore, we can select a set of comparable companies for each sector that the company operates in.

Naval Vessels

Babcock International

BAE Systems

General Dynamics

Huntington Ingalls

Offshore

Keppel

Sembcorp Marine

Systems, Components and Services

National Oilwell Varco

Rolls Royce

Wartsila

System Integrators

ABB

Airbus

Boeing

2. Define possible Multiples

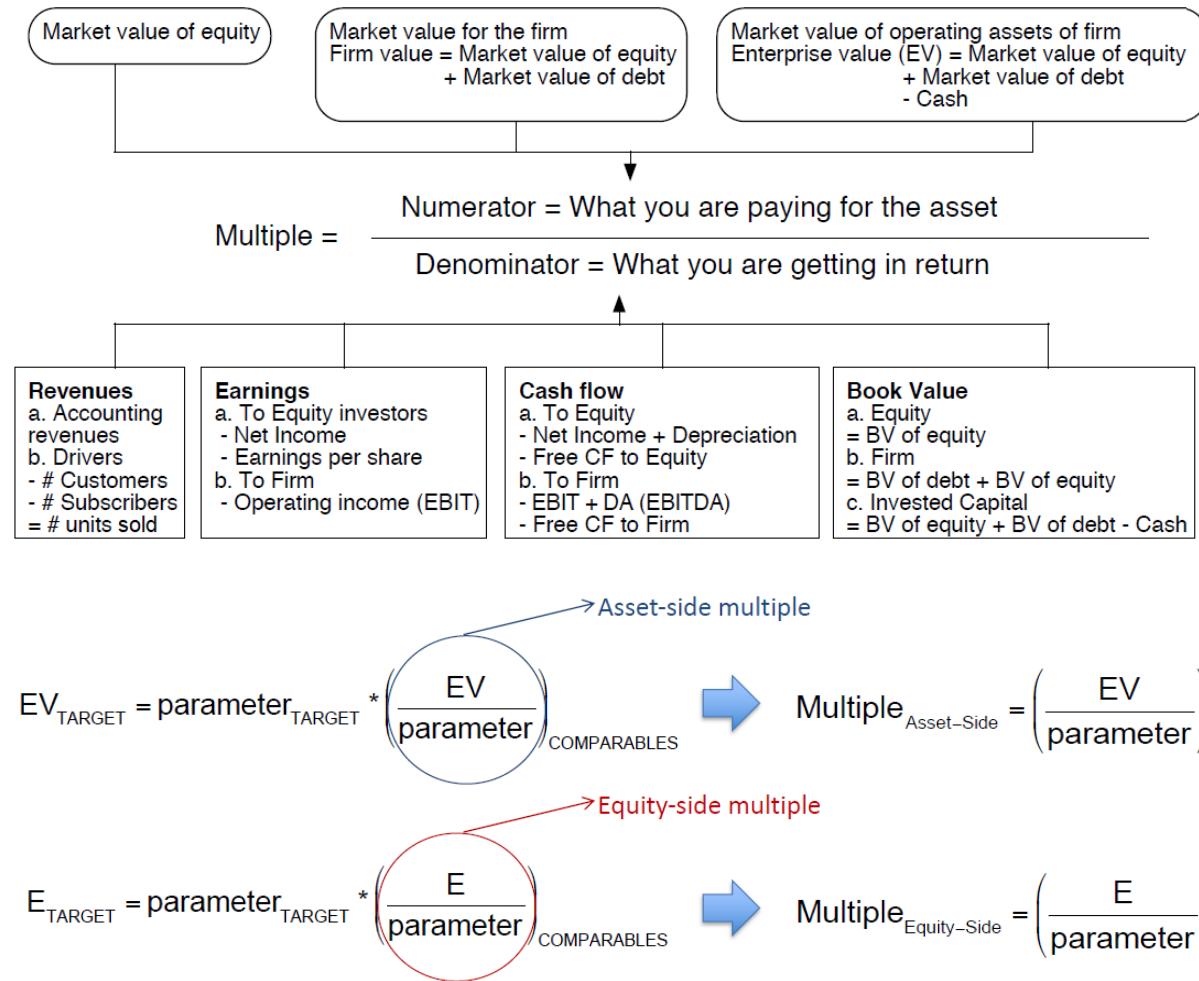
Once comparable companies are identified, possible multiples should be defined to convert companies' market values into standardized values, since the absolute prices cannot be

compared. There is a connection between which multiple we will choose and typology of the target company. The relative valuation is based on the use of multiples that can be defined as the below ratio:

Enterprise value or Equity value or Firm value

a performance measure that considered a good proxy of company's ability to value creation

- Enterprise value (EV), equity value (P) or firm value at numerator.
- A performance measure (Revenues, Earnings, Cash flows, Book Value) at denominator



Note: We are not calculating the equity value that we find on the balance sheet of the company, since we are having a market approach; **we are using the market capitalization, that is, the market value of the equity.**

Market value of equity = Market capitalization = share price * number of shares

Note: For the simplicity, we just use enterprise value (EV) or equity value (P) at numerator (the most used ones).

Note: it is important to have consistency between numerator and denominator (e.g. accounting revenues is related to enterprise value).

Asset-side: Enterprise Value

EV multiples take as reference (numerator) Enterprise Value of comparable companies.

$$E = \text{market capitalization} \quad NFP = (\text{long term debts} + \text{short term debts}) - \text{available cash}$$

$$E = EV - \text{Net Financial Position} \quad EV = E + NFP$$

EV multiples use a parameter (denominator) coherent to an enterprise value perspective

- **EV/EBIT**

Advantage: focus on operating management

Disadvantage: it does not consider different choices in depreciation and amortization (\Rightarrow cash), which is important in sectors with fixed assets (manufacturing companies).

It is a very good multiple for **big assets and big companies**. In addition, it can be used for companies that present in the market for a long period and are **good in terms of operations**.

- **EV/EBITDA**

Advantage: good proxy of cash since considers different choices in depreciation and amortization (**the most used!**). Therefore, it is suitable for **manufacturing companies**.

Disadvantage: neglect CAPEX for different industries

- **EV/FCFF**

Advantage: is a cash flow (the closest proxy of the cash flow). Remember that a comparable firm is the one with cash flows similar to the firm being valued

Disadvantage: **less stable** than other indicators. in fact, EBIT and EBITDA may vary from different years of a small amount, while the free cash flow can change completely from one year to another.

- **EV/Sales**

Advantage: **if the above multiples are negative, the multiple is meaningless**; in those cases, an alternative is using sales. Relative valuation is done not always for the big companies but also for startups that may have problems in EBITDA, EBIT and FCFF. Therefore, we can simply use EV/Sales.

Disadvantage: it does not consider **profitability and the efficiency of the operations**.

Example 1: You are asked to evaluate company Kents, having available some data about the P&L of company Kents and comparable companies in the following tables:

	EV	Sales	EBITDA	D&A
Company A	1280	120	90	15
Company B	2800	230	200	30
Company C	2400	200	170	25
Company D	1650	180	110	15

Sales	200
OPEX	80
EBITDA	120
D&A	15
EBIT	105

We choose comparable companies based on cash flows, potential growth, and risk similar to the target company. As we can see there is not any information regarding growth potential and risk **but a good proxy of cash flow that is EBITDA**. This parameter for company A to D ranges from 90 to 200, however, the discrepancies are not much to omit some of the companies. For example if we had a company with EBITDA equals 1000, we should take it out.

In the example, we can use EV/EBIT, EV/EBITDA and EV/Sales multiples for relative valuation. We should choose based on the characteristics of the target company and also the situation that the company is facing. For example, during the COVID-19 pandemic, EV/Sales considered a good multiple for relative valuation.

	EV/Sales	EV/EBITDA	EV/EBIT
Company A	10.67	14.22	17.07
Company B	12.17	14	16.47
Company C	12	14.12	16.55
Company D	9.17	15	17.37
Min	9.17	14	16.47
Max	12.17	15	17.37
Average	11	14.33	16.86
EV of target	2200	1720	1771

In normal relative valuation, we use at least three multiples, then analyze them in terms of consistency of results, and finally decide on which one to use.

The distribution for EV/EBITDA is more concentrate than EV/Sales (more consistent results). In reality, when we consider for example 50 companies, we take outliers out from enterprise value calculation of the target company or we can use median instead of average.

Equity-side: Equity Value

Equity-side multiples take as reference (numerator) the **Equity Value** of comparable companies. Market capitalization of the company or equally its stock price (P). The market capitalization of the company is given by the price of the stock on the official exchange multiplied by the number of outstanding shares.

Equity-side multiples use a parameter (denominator) coherent to an equity value perspective.

- **P/E (or PE)** = Market price / Earnings **or** market price per share / earnings per share (EPS)

Advantage: quick (**the most used!**)

Disadvantage: affected by depreciation, amortization, profit or loss of discontinued operations.

Variables:

Price: Usually the current price; sometimes, average price over last 6 months or year

Time: most recent financial year (current), most recent four quarters (trailing), expected in the next fiscal year or next four quarters (leading), some future years.

- **PEG** = the ratio between the P/E and the earning growth

Advantage: This allows better considering the forthcoming growth (CAGR) perspectives of the company.

Compound Annual Growth Rate (CAGR):

$$\text{CAGR}(t_0, t_n) = (V(t_n)/V(t_0))^{\frac{1}{t_n-t_0}} - 1$$

$V(t_0)$: start value, $V(t_n)$: finish value, $t_n - t_0$: number of years

Disadvantage: the accuracy of the PEG ratio depends on the growth rate used. Using historical growth rates may provide an inaccurate PEG ratio if future growth rates are expected to deviate from historical growth rates.

- **P/BV**

The ratio between the market capitalization of a company and its **Equity in the balance sheet** (Share Capital + Reserves + Profit (Loss) of the year)

- **P/FCFE**

The ratio between the market capitalization of a company and its FCFE.

Example 2: Assume the following data for two hypothetical companies:

Company A	Company B
price per share = 46\$	price per share = 80\$
EPS this year = 2.09\$	EPS this year = 2.67\$
EPS last year = 1.74\$	EPS last year = 1.78\$

Calculate P/E and PEG.

Company A	Company B
P/E ratio = 46/2.09 = 22	P/E ratio = 80/2.67 = 30
Earnings grow rate = 20%	Earnings grow rate = 50%
PEG ratio = 22/0.2 = 109	PEG ratio = 30/0.5 = 60

If we only look at P/E we would see that company B is more expensive than company A, since in A we will pay 22 times more and in B 30 times more. However, the PEG ratio shows that company A will not grow significantly. Even if company B is more expensive, the value of the earning per share will increase a lot.

Example 3: You want to estimate the equity value of Water through the relative valuation. You know that water has to pay 100 euro of interests and has a corporate tax of 40%.

You have identified two listed comparable companies (Still and Sparkling) whose price per share is 2.34 and 2.75 euro per share, respectively. Furthermore, the earnings of Still have been 140 euro while the earnings of Sparkling have been 185 euro. Finally, you know that Still has 1000 shares while Sparkling has 1200 shares.

WATER: Sales: 800 EBITDA: 540 EBIT: 330

With the information available, select the adequate multiple and compute E (equity value) of Water. Remember that price per share multiplied by number of shares = P = Equity Value

	Still	Sparkling
Price per share	2.34	2.75
Number of shares	1000	1200
Equity Value (P)	2340	3300
Earnings (E)	140	185
P/E	16.71	17.84
Average		17.27

Net profit of Water:

$$EBIT - Interest = 330 - 100 = 230 \quad Net\ profit = 230 * (1 - 0.4) = 138 \\ Equity\ value\ of\ water = 138 * 17.27 = 2383.26$$

Therefore, if Water go through the IPO process, it can easily determine the price per share by choosing the **number of shares** that they would like to have.

3. Analyze multiples

When using multiples to evaluate a business, the values obtained are likely to be different using different multiples, and deciding which multiple to use can make a big difference to the value estimation. In the following table, multiples that better underline the value of the companies in different sectors are presented:

Multiple	Sector	Explanation
EV/Subscriber	Various	Subscriber based businesses, such as Cable and Direct To Home (DTH), gaming platforms, social media, Netflix
EV/EBITDAX	Oil & Gas	Excludes exploration expenses
EV/EBITDAR	Retail, Airlines	Used when there are significant rental and lease expenses incurred by business operations
EV/Reserves	Oil & Gas	Used when looking at Oil & Gas fields and companies heavily involved in upstream. Gives an indication of how much the field is worth on a per barrel basis

In oil & gas sector, exploration expenses will not immediately lead to cash generation so excluding those expenses lead to more consistent results for relative valuation. Therefore, EBITDAX considered a good proxy of a company's ability to value creation in oil & gas sector.

For airline companies EV/EBITDAR is a better valuation metric than the P/E ratio for two reasons:

1. Airline companies generally have high debt levels. Price multiples do not consider debt, while EV multiples do.
2. Airline companies also have leases, as aircraft can either be purchased or leased and multiples vary accordingly. EV/EBITDAR is considered after adding back lease rentals in order to make companies with different leases and ownership structures comparable.

The following table shows which sectors use asset-side multiples and which of them apply equity-side ones.

▪ Airline	EV/EBITDA, EV/Sales
▪ Banks	P/BV
▪ Chemicals	EV/EBITDA
▪ Cement	EV/EBITDA, P/E
▪ Drinks	EV/EBITDA, EV/Sales
▪ Healthcare	P/E, PEG
▪ Insurance	P/Embedded Value
▪ Mobile Communications	EV/Sales, R&D/Assets
▪ Semiconductors	EV/EBITDA
▪ Engineering	P/E, EV/EBITDA
▪ Retailing	EV/Sales, EV/EBIT
▪ Utility	Div. Yield, EV/EBITDA
▪ Oil	EV/EBITDA

Bank and insurance sector use equity-side multiples for relative valuation because they do not create products and do not have real assets within them, however, they can have buildings but what they do is the processing of the money of other people. For manufacturing companies, financial analysts most likely look at the asset-side or enterprise value.

To choose the best multiple:

- Identify a subset of multiples that are significant from a theoretical point
- Identify one or more driver or fundamentals that could explain the variance among the multiples of the different comparable companies (the number of companies should be at least 10)
 - Average
 - Adjusted average
 - Standard deviation
- Check the relation between fundamentals (major parameters according to which our company grow) and multiples

Calculation of multiples for Fincantieri comparable companies

Comparable companies	EV / EBITDA	P/E	P/BV
Offshore			
• Keppel	9,6 x	10,5 x	1,9 x
• Sembcorp Marine	9,1 x	15,5 x	3,1 x
Naval Vessels			
• Babcock International	15,7 x	24,9 x	4,5 x
• BAE Systems	8,4 x	81,6 x	4,1 x
• General Dynamics	10,7 x	18,1 x	3,1 x
• Huntington Ingalls	9,6 x	19,1 x	3,2 x
Systems, Components and Services			
• National Oilwell Varco	7,7 x	14,2 x	1,5 x
• Rolls Royce	8,9 x	14,8 x	3,6 x
• Wartsila	13,5 x	20,5 x	4,7 x
System Integrators			
• ABB	8,8 x	18,0 x	2,6 x
• Airbus	10,1 x	28,6 x	3,7 x
• Boeing	13,8 x	22,5 x	7,1 x

Four steps for understanding multiples

1. Define the multiple

In use, different users can define the same multiple in different ways. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated

2. Describe the multiple

Too many people who use a multiple have no idea what its cross sectional/industry distribution is. If you do not know what the cross sectional/industry distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.

3. Analyze the multiple

It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.

4. Apply the multiple

Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

Exercise

1. Teta competes on the soft drinks market with global brands that allowed revenues around 5650 million US dollars in 2019 (market share of 16.4%). Teta's drinks are sold in all continents without any specificity for local tastes and traditions. The main strategy is to sell the same product everywhere. EBITDA of Teta in 2019 is about 3420 million US dollars, FCFE is about 1,542 million US dollars, financial debts are 3,000 million US dollars and cash and cash equivalents is equal to 1,702 million US dollars.

In the following table, some 2019 data (in millions of US dollars) about producers of soft drinks:

PRODUCERS OF ...	Equity Value	Enterprise Value	Revenues	EBITDA	FCFE
GLOBAL BRANDS					
<i>Alpha</i>	19,990	24,600	4,355	2,090	1,740
<i>Beta</i>	16,340	21,450	3,890	1,876	1,450
<i>Gamma</i>	14,920	19,070	3,223	1,540	1,260
LOCAL BRANDS					
<i>Delta</i>	1,250	4,050	410	174	145
<i>Epsilon</i>	2,440	7,210	688	288	288

Using the relative valuation approach, and rounding the calculations at the second digit, it is true that:

- a. The Equity Value of Teta is about 37,569 million US dollars.
- b. The Equity Value of Teta is about 30,870 million US dollars.
- c. **The Equity Value of Teta is about 39,263 million US dollars.**
- d. The Equity Value of Teta is about 56,100 million US dollars.

An asset side approach should be preferred. The most correct multiple is EV/EBITDA limited to companies with global brands.

Taking into account that Teta is a global company, we have to focus on global brands (Alpha, Beta and Gamma). There is huge difference in size between Teta and local brands.

From the data provided, we can use three multiples (EV/Revenues, EV/EBITDA and E/FCFE).

Taking into account the typology of the company, EV/EBITDA is the most appropriate multiple

- EV/Revenues is proper for startups that may have problems in EBITDA, EBIT and profit. Therefore, this multiple should not be used for mature companies with positive EBITDA.
- As Teta is a manufacturing company, we should focus on asset side instead of equity.
- Usually we use the equity-side approach when the company is less dependent on the production, like technology-based companies and service companies.

	EV/EBITDA
Alpha	24600/2090 = 11.77
Beta	21450/1876 = 11.43
Gamma	19070/1540 = 12.38
Average	11.86
EV of Teta	3420 * 11.86 = 40561

$$\text{Equity value} = \text{Enterprise Value} - \text{NFP} = 40561 - (3000 - 1702) = 39263$$

Note: relative valuation is not a comparison analysis.

2. Company X is negotiating the sale of Company F to a potential buyer. In order to support the negotiation, it wants to estimate the Equity Value of Company F based on relative valuation. In the following table you can find a summary of 2019 key financial information of Company F:

Selected financial data	31 st Dec 2019
EBIT [k€]	3,900
Net cash flow [k€]	2,000
Net financial expenses [k€]	1,050
Corporate tax rate	40%
N. shares	1,000
Capital [k€]	1,000

You have also access to the following data about six companies that compete in the same industry of Company F:

	H	I	J	K	L	M
Price (31 st Dec 2019) [€/share]	2.8	2.75	4.2	1.26	3.96	1.8
Earnings per share [€/share]	1.4	2.0	1.0	0.9	1.8	1.0
Net profit (2019) [k€]	1,400	2,400	2,000	2,800	1,800	3,000
N. shares (31 st Dec 2019)	1,000	1,200	2,000	1,400	2,000	3,000
Capitalization (31 st Dec 2019) [k€]	2,800	3,300	8,400	1,764	7,920	5,400
Net cash flow (2018) [k€]	1,100	950	1,000	3,600	1,300	1,200
Net cash flow (2019) [k€]	2,000	1,700	1,800	3,200	2,200	2,100
D/E ratio	2.0	1.9	2.4	4.0	1.8	3.0

Considering the available data, calculate the Equity Value of Company F

- a) The Equity value of Company F is about 9,028 k€
- b) The Equity value of Company F is about 3,698 k€
- c) **The Equity value of Company F is about 3,958 k€**
- d) The Equity value of Company F is about 6,598 k€

Company K is not comparable based on cash flow, risk (D/E ratio) and growth criteria. Furthermore, the capitalization is very low while net cash flow is high, which means company might sold part of the company or main assets to cover debts. Consequently, the market appreciation and as a result price per share went down. Therefore, it must be excluded.

From the data provided, we can just calculate P/E.

	P/E
H	2.8/1.4 = 2
I	2.75/2 = 1.38
J	4.2/1 = 4.2
L	3.96/1.8 = 2.2
M	1.8/1 = 1.8
Average	2.315
Equity value of F	1710 * 2.315 = 3958 or 1.710 * 2.315 * 1000 = 3958

Here it is better to use median because we have J as an outlier. In general, for median or other statistical approaches there should be more samples to get better results. Here, for simplicity we use average again.

*Net profit of company F = (EBIT - Net Financial Expenses) * (1 - Corporate Tax Rate)*

$$\text{Net Profit} = (3900 - 1050) * (1 - 0.4) = 1710 \quad EPS = 1710/1000 = 1.71$$

If in this example, we had two groups of three companies, one group similar to H and the other group similar to K, we should consider all of them for relative valuation.

3. You are comparing Company F and Company D using multiples.

For company F, you know the following information:

- Price per share (31.12.2019) = 3.5 € per share
- Revenues (2019) = 150 mln €
- Revenues (2018) = 120 mln €
- N. of shares (2019) = 18 mln of shares
- Net profit margin (2019) = 12%
- EPS (2019) = 1 € per share
- EPS (2018) = 0.97 € per share
- The number of shares is stable between 2018 and 2019

For company D, you know the following information:

- Price per share (31.12.2019) = 3.5 € per share
- Revenues (2019) = 120 mln €
- Revenues (2018) = 115 mln €
- EPS (2019) = 0.35 € per share
- EPS (2018) = 0.30 € per share
- The number of shares is stable between 2018 and 2019

With the information available, which of the following sentences is CORRECT?

- a) In 2019, the Enterprise Value of Company F is lower than the Enterprise Value of Company D
- b) In 2019, the Equity Value of Company D is lower than the Equity Value of Company F
- c) In 2019, the PEG of Company F is lower than the PEG of Company D
- d) **In 2019, the PEG of Company D is lower than the PEG of Company F**

We do not have enough information to calculate the enterprise value but we can compute the equity value of company F in 2019. However, since we do not have the number of share for company D, we cannot obtain equity value of company D.

$$\text{Net profit (F)} = \text{revenues} * \text{net profit margin} = 150 \text{ mln} * 0.12 = 18 \text{ mln (for 2019)}$$

$$P/E (F) = \text{market capitalization} / \text{net profit} = (18 \text{ mln of shares} * 3.5 \text{ € per share}) / 18 \text{ mln}$$

$$P/E (F) = 3.5$$

$$\text{Earnings growth} = 1/0.97 - 1 = 3\%$$

$$\text{PEG (F)} = \text{PE ratio} / \text{Earnings growth} = 3.5 / 3\% = 1.17$$

$$P/E (D) = \text{price per share}/\text{EPS} = 3.5 \text{ € per share} / 0.35 \text{ € per share} = 10$$

$$\text{Earnings growth} = 0.35/0.30 - 1 = 16.7\%$$

$$\text{PEG (D)} = \text{PE ratio} / \text{Earnings growth} = 10 / 16.7\% = 0.59$$

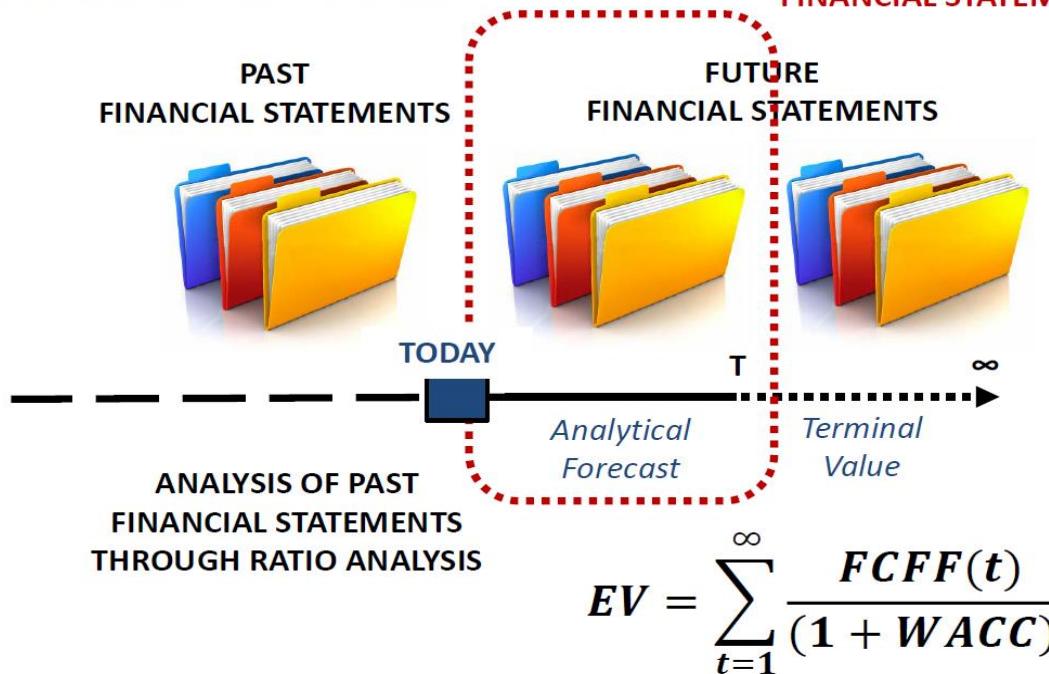
$$P/E (D) > P/E (F) \text{ but } \text{PEG (D)} < \text{PEG (F)}$$

Target Setting & Budgeting

Budgeting is the process of generating the future financial statements.

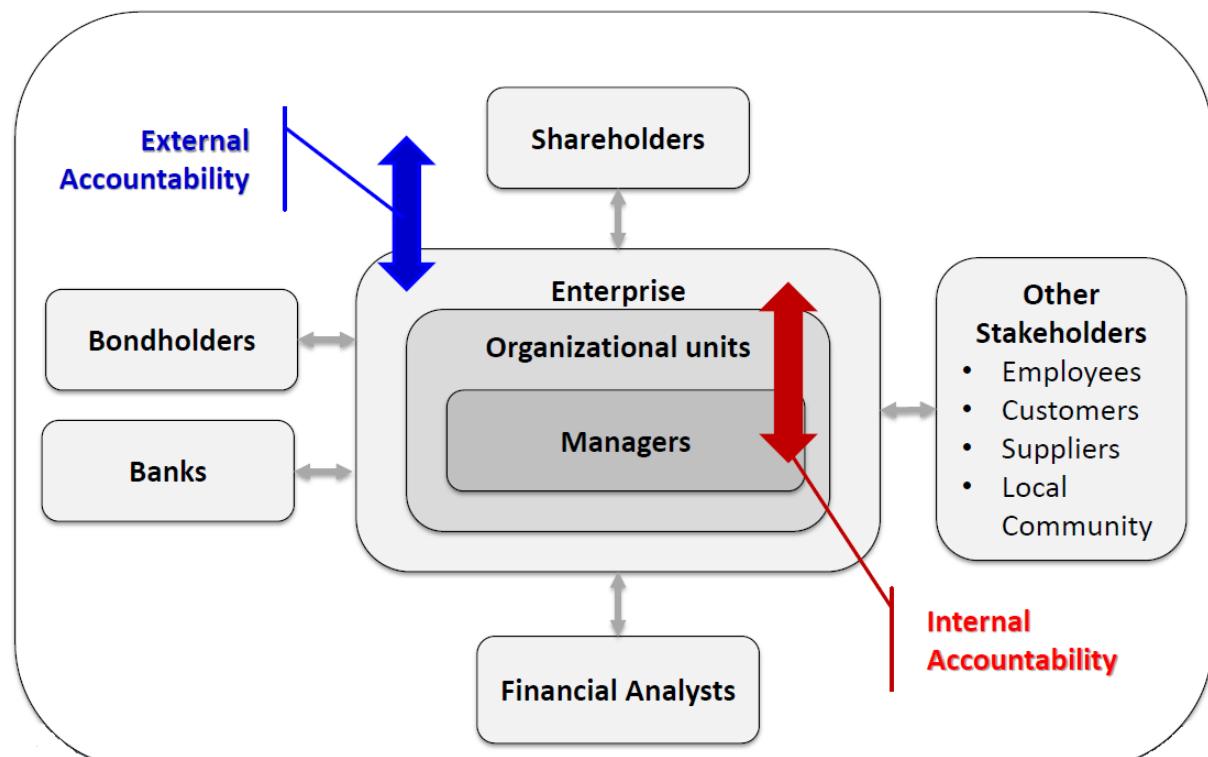
Where we are so far

HOW TO DRAFT THE FUTURE FINANCIAL STATEMENTS?



From OUTSIDE to INSIDE

External accountability refers to the numbers that the company produces from the outside. On the other hand, internal accountability is the process of generating data for managers at different levels of organization's hierarchy. CFO is the leading manager who is in charge to distribute information inside the company. Of course, the CFO does his/her job with help of controllers (business controllers, supply chain controllers, etc.)



Management Accounting

Management Accounting is the process (sequence of activities) of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management (internal customers of this process) to plan and control within an entity and to assure appropriate use of and accountability for its resources. It means you should know how to use resources (because they are limited), and what are the results that you are achieving. Management accounting deals with the daily activities of any manager.

Management accounting also comprises the preparation of financial reports for non-management groups such as shareholders, creditors, regulatory agencies and tax authorities. According to this part of definition, financial accounting is a part of management accounting; however, they are two different disciplines.

Note: being a controller is not enough to interpret the information because he/she needs the knowledge of other managers. Therefore, interpretation is done together with other managers. For instance, if a controller has the data related to supply chain, he/she should discuss with supply chain manager in order to understand and interpret the data.

In the communication phase, you need to communicate the results, explain the numbers, describe the formulas and procedures that generated these numbers, and make these numbers understandable and reliable for the other managers.

Note: Financial accounting is connected to the external accountability and analysis of financial reports.

The Plan & Control Cycle

The starting point is **goals**; you cannot plan your activities if you do not know in advance the **goals**. The goals are the list of different results that should be achieved by managers. These goals are connected to financial reports because different stakeholders (outside) will evaluate the performance of the company using the financial reports. For instance, the top managers will be evaluated against ROE, NPM and the payout ratio. The middle line managers will be assessed internally based on ROA, ROI and so on.

Typically, we use the term “plan”, when we refer to activities that will be put in place the next 12 months. Therefore, the planning is made year by year because we want to generate the financial reports and apply the financial ratio analysis every year.

Short-term Goals are in term of:

- **Financial Indicators**
ROE, ROI, ROS, ATR, D/E, CF from operating activities
- **Non-financial indicators** (they are specific function by function)

Customer satisfaction (sales), delivery time (outbound logistics), carbon footprint (operations), number of patents (R&D)

Managers cannot achieve these goals without **resources**. They should be responsible for these resources and use them to accomplish the goals. All resources made available to Managers:

- **From the Financial Statements (asset-side)**

Machinery, patents, brands, money etc.

- Not included in the Financial Statements

Employees (creativity, commitment, passion), Competencies, Data (it is the new oil), Network (relationships, connections, and partnerships), etc.

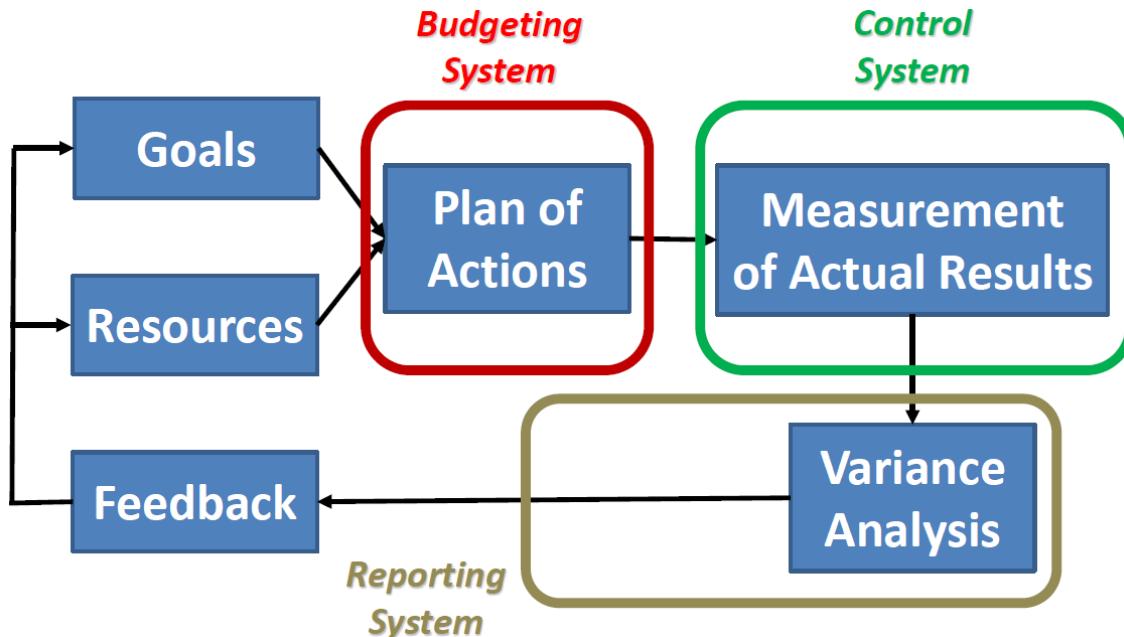
Plan of actions connect resources with goals; what the company is supposed to do with available resources in order to meet the goals. What the different Business Units / Organizational Units of the enterprise should do in the next 12 months to meet the expected Goals against the Recourses that will be made available? Plan of actions should be coherent to the resources and lead to meet the goals. The generation of plan of actions start every year around April and conclude around November because it is not easy to organize resources to achieve goals.

Then, it is important for the company to **measure the actual results** (that the company has achieved) in a periodic way in order to **measure the differences between the results and goals**. What is the “distance” between actual results and targets (goals)? Why do they differ? Is it the result of external or internal contingencies? If you do not know the reason, you cannot fix the problem and change the plan of actions.

The final phase is feedback, including corrective actions. What managers should do differently to align actual results and targets? Should they need more or different resources? Are contingencies so different from expected that Goals must be revised?

Note: measurement of actual results, variance analysis and feedback constitute the **control part**.

Note: The plan & control cycle originated from information science. It is a coordination mechanism that guarantees that different functions (sales, R&D, marketing, operations, logistics ...) are well aligned together in order to achieve a common goal (in the short-term it is ROE and in the long-term it is enterprise value or equity value).



Note: we have very different systems that allow us to implement the plan and control cycle. The **budgeting system** refers to the definition of plan of actions (what the different functions will do the next 12 months). **Control system** (cost accounting) refers to the measurement of actual results. **Reporting system** is connected to variance analysis. Part of the reporting

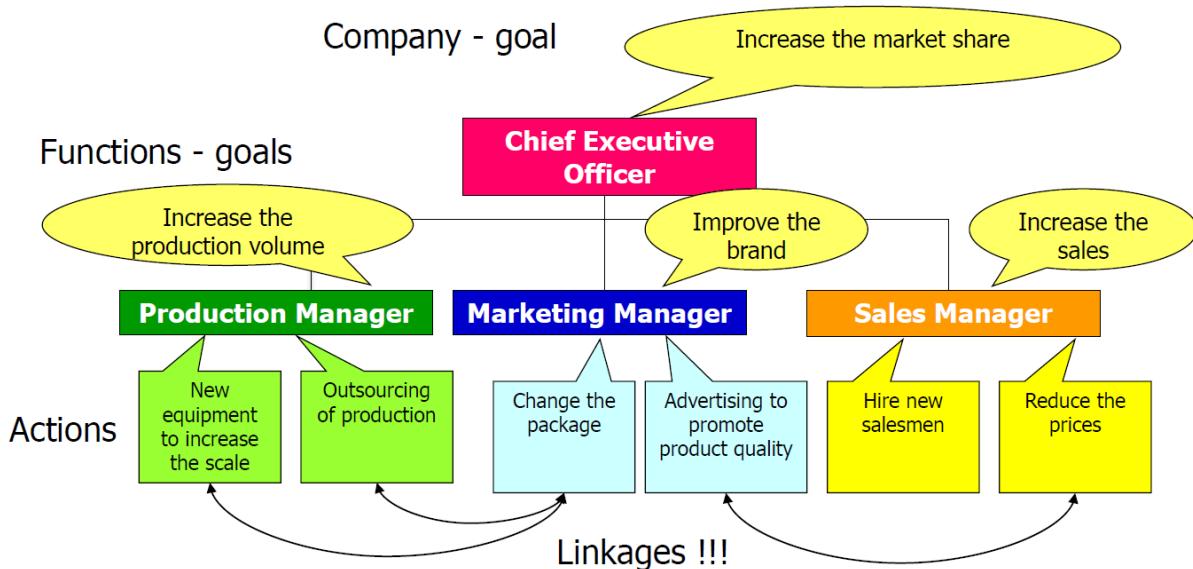
system is the communication with managers regarding the variation between actual results and goals and causes of it in order to allow them to introduce corrective actions (what should be done differently), thus returning back to the beginning of the cycle to revise goals and available resources. There is also the fourth system called **rewarding system**. For people, it is important to reward their behavior in order to align their behavior to the expectations of the organization.

Why budgeting?

We need budgeting to align different parts of an organization. Budgeting process is the clearest example of standardization by output, meaning that all different parts should move to achieve the same output. Standardization by output is also connected to one of the rewarding systems for employees, which is based on the results (MBO - managing by objectives).

Note: Any goal without specified numbers is not a goal (without numbers, there is no possibility to evaluate the results). Therefore, "increase the market share," means nothing.

Note: actions that are taken by each manager make sense individually; however, they are not independent and different actions should be aligned (linkages). For instance, advertising to promote product quality is not compatible with reducing the prices (opposite strategies). Therefore, you cannot leave your employees to decide alone because it leads to incoherent actions.



Budgeting

Budgeting is a set of procedures and activities aimed at assigning to organizational units targets – i.e. reference values for their performance – and resources needed to achieve these results. A key feature in budgeting is the role of people involved in the process.

- Managers responsible for organizational units
- Other employees working within organizational unit affected by target setting
- Accounting and finance functions supporting the process.

Note: Budgeting process is referred to as an interruption moment, when managers stop doing daily activities and think about the next future, collect and share ideas and finally select the most promising one.

Note: A budget is not money; it is the plan of actions (translated into money) that different functions are supposed to do coherently in the next 12 months in order to achieve goals.

A budget is:

- The quantitative expression of a proposed plan of action by management for a specified period and
- an aid to coordinating what needs to be done to implement that plan

The final output of the budgeting process is the Master Budget, which is a document that:

- Expresses management's operating and financial plans for a specified period (collection of different plans of actions)
- Comprises a set of budgeted financial statements of the next 12 months (because you want to simulate the ratio analysis done by shareholders, banks, financial analyst, etc.) In this way, we can see if the plan of actions that we are taking for the next 12 months is able to generate results that will be well-accepted by stakeholders and shareholders. Therefore, the plan of actions should be revised many times to achieve the desired results (typically, 10 to 15 times every year).

Master Budget

We have three groups of budgets each of which is a collection of budgets that are documents explaining plan of actions.

Budgets	Content	Check	Final output
Operating budgets	<u>It is a collection of plans of actions aimed at budgeting the income statement until EBIT.</u> They define the typical management of a business as they define the budget of sales, the revenues, the economic flows of raw materials, labor, services etc. in order to calculate the <u>expected EBIT</u> .	<u>Is your plan of actions able to generate revenues that are able to cover operating costs?</u> Economic Equilibrium Revenues vs Operating Costs	Budgeted EBIT
Capital Expenditure (CAPEX) budgets	<u>They define the use of financial resources (planned cash outflows for the next 12 months) to sustain the growth strategy</u> – i.e., planned instalments for the purchase of assets.	<u>Is the available capacity (labor, machinery, raw materials ...) at least equal to the needed capacity?</u> Technical Equilibrium Available vs Needed Capacity	Budgeted CAPEX
Financial budgets (cash budgets)	<u>They define the impact of operating and investment plans on cash inflows and cash outflows.</u>	<u>Are cash inflows able to cover cash outflows?</u> <u>(capability of a company to grow without leverage)</u> Cash Equilibrium Cash Inflows vs Cash Outflows	Budgeted Cash Flow Statement

All These budgets or documents are then used to prepare:

- Budgeted Income Statement
- Budgeted Balance Sheet
- Budgeted Cash Flow Statement

Note: Most of the companies apply budgeting process because they need to plan and to assign targets and plans of actions to different managers.

Case study about budgeting

In the first part of this case study, we want to produce all the budgets that are needed to forecast the EBIT for the next 12 months.

The Chief Executive Officer (CEO) negotiates the targets in terms of financial ratios (e.g., ROE, NPM etc.) with the shareholders. Therefore, CEO collects the expectations of shareholders. Then, CEO communicates the targets or expectations to the Chief Financial Officer (CFO). Finally, CFO shares these goals with all Managers and opens the budgeting process in order to identify that plan of actions that will allow the whole company to meet the expected targets.

Target:

ROS (Return On Sales) 2022 > 15%

ROA (Return On Assets) 2022 > 10%

For now, we focus on the first target because we want to analyze the operating budget so we just consider the income statement from revenues until the EBIT. Therefore, we cannot calculate ROA with just knowing the operating budget.

Budget of Revenues

The Chief Financial Officer (CFO) invites:

- The **Marketing Manager** (who oversees price setting), and
- The **Sales Manager** (who oversees sales)

to agree the expected quantities that will be sold for every product-line at a certain price, every month, in the various geographical markets, through the different channels (retails vs internet).

These two managers are typically the future chief executive officer so they have a very relevant role in the company because they are connected to the market and customers. In general, the marketing manager is responsible to set the price and the sales manager is responsible to sales (quantity). The combination of their roles is the revenues. For the operating budget, the accuracy of revenues is the most important thing because the process begins from the first line of income statement towards EBIT.

These two managers usually are in conflict because sales manager wants low prices to increase sales while marketing manager wants to keep prices high (higher the price, more money for advertising and better marketing functions)

*Budgeted Revenues = 70€/unit * 1,000 units = 70,000 €*

Budget of Production (1)

The Chief Financial Officer (CFO) invites:

The **Logistics Manager** (who oversees the level of inventories of finished goods and the service level agreements (SLAs) with the distributors/final customers) to agree the expected inventories to meet the expected SLAs.

A service-level agreement (SLA) is a commitment between a service provider and a client. Particular aspects of the service – quality, availability, responsibilities – are agreed between the service provider and the service user. The most common component of an SLA is that the services should be provided to the customer as agreed upon in the contract.

Budgeted production is the number of units that the company will produce in the next year. It can be calculated considering sales and the variation of finished goods inventory.

We need to produce 1000 units for the market and another 50 units for increasing the level of finished goods inventory.

Budgeted Production (units) =

+ Budgeted Sales

+ Target ending inventories of finished goods

- Beginning inventories of finished goods

$$= 1,000 \text{ units} + (75 \text{ units} + 50 \text{ units}) - 75 \text{ units} = 1,050 \text{ units}$$

Note: In case we expect zero inventory for 2022, we need to produce 925 units.

Budget of Production (1)

The Chief Financial Officer (CFO) invites:

The **Operations Manager** (who oversees the production of finished goods) to verify that the budget of production defined so far will be feasible considering the resources (materials, labor hours, machine hours) that will be made available.

Note: Generally, companies are divided into two groups of top line and bottom line companies. Top line refers to the first line of the income statement (revenues), meaning that marketing and sales managers rule in the company. Therefore, there is no way for the operations manager to reject the budgeted production (he/she must find the solution to do that). 95% of companies are top line and the remaining are bottom line companies in which operations manager rules. Typically, there are many bottlenecks in resources in these companies. Typically, operations manager is the future chief executive officer because the production is complicated (requires specific materials, competences, knowledge ...). In addition, usually these companies are B2B where marketing is less relevant than B2C. The company in our case is a top line company.

In the case, there is no information about bottlenecks or shortage in the materials and labor time. Therefore, we consider that on the material and labor side; we do not have any problem.

The only constrain is about machine hours

$$\text{Capacity available} = 3,000 \text{ h} - 150 \text{ h} = 2,850 \text{ h}$$

$$\text{Capacity needed} = 1,050 \text{ units} * 3 \text{ h/unit} = 3,150 \text{ h}$$

⇒ The budget of production is NOT feasible... 300 h will miss!!!

The Operations Manager must evaluate different alternatives to make the budget of production **feasible**. Some alternatives to be evaluated against the information available:

- Increase machine hours (new assets \Rightarrow CAPEX)

It is written in the case that the scale of production cannot be increased in the short-term. In addition, we buy new machine when the increase of the demand is stable. Therefore, we should analyze the demand patterns to identify whether it is structural change or just episodic.

- Reduce sales by increasing the price per unit

Since we do not know the price sensitivity of the market or the elasticity of the demand respect to the price, we do not follow this scenario.

- Reduce the level of target ending inventories of finished goods

This scenario is risky because we should maintain the minimum level of inventories of finished goods to meet the service level agreements. Since we want to change the expectations of the logistics manager, this solution should be negotiated with him/her. However, it is written in the case that the decision for 50 units increase in finished goods inventory cannot be modified.

- Reduce the number of hours for planned maintenance

It is not a good solution because it endangers the safety of equipment, labors, and products (quality).

- Reduce the machine hours needed for each unit

It is not feasible because it is written in the case that 3 hours/unit machine time is standard. Therefore, production engineers have produced these data, which is the best forecast on production time considering the condition with normal efficiency. Therefore, we cannot go beyond this number in the short term.

- Search for a third-party supplier

The purchasing cost should be lower than the price per unit. If it is higher than the price we should consider market share loss or reputation loss and then decide to face this additional cost or not.

In our case \Rightarrow SPU = €70/unit > purchasing cost = €45/unit

Now that the Operations Manager has identified how to make feasible the budget of production, she confirms the production-mix to the Chief Financial Officer

Budgeted Production Mix = Units MAKE + Units BUY

Units MAKE = 2,850h / 3h/unit = 950 units

Units BUY = 1,050 units - 950 units = 100 units

Budgeted Production Mix = 950 units MAKE + 100 units BUY

Budget of Cost of Goods Sold

The Chief Financial Officer supported by the plant controllers, who know the bills of materials and the production cycles, calculate the expected full product cost of every product-line.

The company will produce 950 units MAKE

Full product cost = cost of direct materials + cost of direct labor + plant Overhead

Note: Plant overhead refers to indirect product cost such as depreciation, utilities, rent, supervision, insurance and so on.

Note: This formula is right for companies that are using job order costing (tracing the consumption of raw materials and labor). For companies that are using process costing, operations costing or activity-based costing, this formula is wrong. The current formula should be:

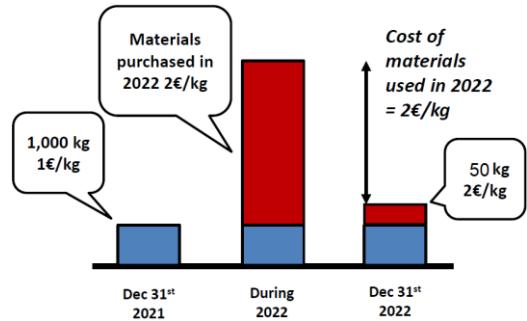
$$\text{Full product cost} = \text{cost of raw materials} + \text{cost of labor} + \text{other operating costs}$$

In this specific case, all costs are direct because the company has one single product.

For the cost of direct materials, we have two choices:

- Materials in the warehouse 1 €/kg
- Materials that will be purchased 2 €/kg

However, inventories are accounted using the Last in First out (LIFO) method. Therefore, we can consider that during 2022, the company will use only the new purchased materials at the cost of 2€/kg.



Target level of raw materials inventories at 31/12/2022: + 5% kg compared to 31/12/2021.

Note: IAS do not accept LIFO method anymore. They only accept FIFO and average cost methods.

Note: Choosing between FIFO and LIFO depends on the physical configuration of warehouse.

Note: outside the academia, in companies, overhead cost is the synonym of period cost (sales, R&D, marketing costs ...). In order to distinguish the indirect costs from period cost, we use the term plant or factory before overhead.

$$\text{Full product cost} = \text{cost of direct materials} + \text{cost of direct labor} + \text{plant Overhead}$$

$$\text{Cost of direct materials} = 950 \text{ units} * 6 \text{ kg/unit} * 2\text{€/kg} = 11,400\text{€}$$

$$+ \text{Cost of direct labor} = 950 \text{ units} * 2 \text{ h/unit} * 8 \text{ €/h} = 15,200\text{€}$$

$$+ (\text{plant}) \text{ variable Overhead} = 2,850 \text{ h} * 1.5 \text{ €/h} = 4,275\text{€}$$

$$+ (\text{plant}) \text{ fixed Overhead} = 3,000\text{€} + 2,000\text{€} + 605\text{€} = 5,605\text{€}$$

$$= \text{Budgeted Cost for MAKE units} = 36,480\text{€}$$

$$\Rightarrow \text{Budgeted full product cost per unit} = 36,480 / 950 = 38.40 \text{ €/unit}$$

$$\text{Cost (MAKE)} = 38.40 \text{ €/unit} < \text{Cost (BUY)} = 45\text{€/unit}$$

Note: The formula related to cost of direct labor is make sense under the assumption that the cost of labor is a variable cost (varies in direct proportion with units). Therefore, in case of small and medium enterprises with permanent contracts, this formula is wrong because we must also consider the spare time of employees. This formula is coherent to the regulatory context of the US, which consider labor cost as variable costs.

Note: Production manager must use flexible workers (e.g., seasonal employees) to make the cost of labor fully variable cost.

Note: Supervision is a fixed cost, while labor cost is considered variable costs.

Note: in case that cost of make were higher than the cost of buy, you should not outsource production because you still have to pay for supervision, rent, and depreciation. You decide to outsource only when the sum of additional cost and fixed cost is still convenient.

An **avoidable cost** is a cost that is not incurred if the activity is not performed. Examples include labor cost, packaging, or materials. These costs are often identified as **variable costs**. If there is no production, there is no cost.

An **unavoidable cost** is a cost that is still incurred even if the activity is not performed. For example, if a manufacturing plant shuts down, its avoidable costs (i.e. variable costs), like materials or supplies, will be \$0, but it still needs to pay for idle equipment, property taxes, lease payments, etc. These costs are often considered **fixed costs**. Fixed costs are expenses that do not depend on production.

Note: The budgeting process prefers the income statement by function (or by destination) and never uses the income statement by nature because we are focusing on different organizational units, giving responsibility to each of them and we want to know how they work together to achieve a common goal.

Note: Budget of Cost of Goods Sold is the budget of the operations. We need to refer to Budget of Cost of Goods Sold because of the matching principle (the costs are connected to the revenues) that is the basic principle for drafting the income statement. Therefore, we just consider the cost of 1000 units that will be sold in 2022 and not 1050 units.

To calculate the Budget of Cost of Goods Sold the sales-mix must be pointed-out

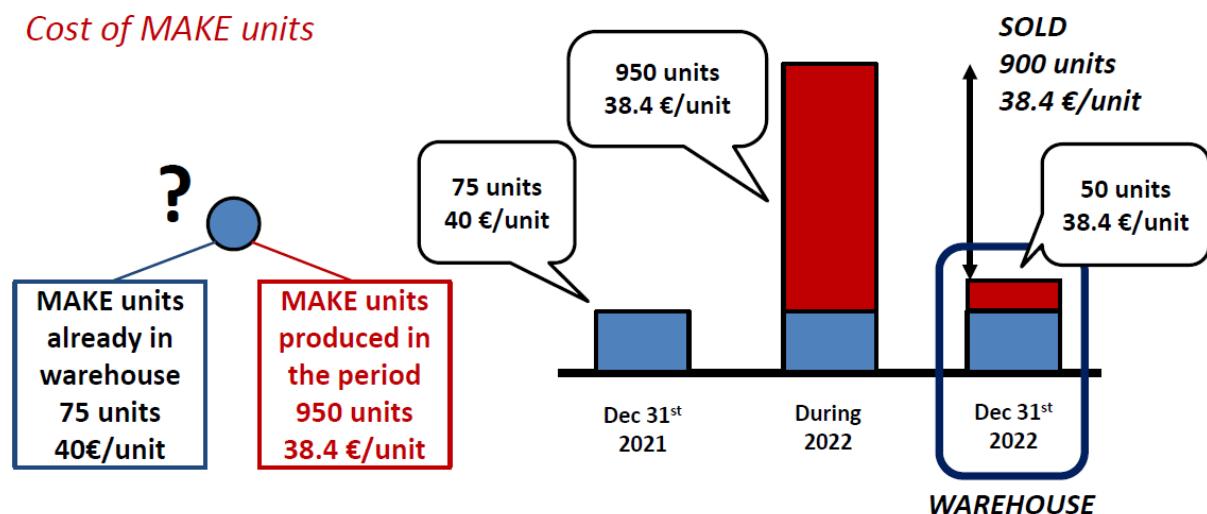
$$Sales - mix = 1,000 \text{ units} = 900 \text{ units } MAKE + 100 \text{ units } BUY$$

It is written in the case that the company prefers keeping as inventory products that have been internally manufactured.

What MAKE units will be sold?

- Those that are already in the warehouse (75 units, 40 €/unit)
- Those that will be produced in 2022 (950 units, 38.40 €/unit)

⇒ The company uses a LIFO approach.



To calculate the Budget of Cost of Goods Sold the sales-mix must be pointed-out

$$Sales - mix = 1,000 \text{ units} = 900 \text{ units } MAKE NEW + 100 \text{ units } BUY$$

$$\text{Budget of Cost of Goods Sold} = 900 \text{ units} * 38.40 \text{ €/unit} + 100 \text{ units} * 45 \text{ €/unit} = 39,060 \text{ €}$$

Budgeted Gross Margin

The Chief Financial Officer knowing the budget of revenues and the budget of cost of goods sold can budget the gross margin.

$$\begin{array}{rcl} + \text{ Budget of Revenues} & + & 70,000\text{€} \\ - \text{ Budget of Cost of Goods Sold} & - & 39,060\text{€} \\ \hline = \text{ Budgeted Gross Margin} & = & 30,940\text{€} \end{array}$$

The next step is to budget period costs (all the other functions of the company).

Budget of Period Costs

The Chief Financial Officer involves the Managers of the other Functions to budget the period costs:

- Sales & Marketing
- Administrative & General

Since period costs are not directly connected to the volume of production, it is not easy to calculate it (what is the R&D cost (budget) to get two patents in 2022? what is the money needed to get the customer satisfaction equal to 9 out of 10? What is the money needed to increase the market share by 10%? ...). We do not know what is the money needed to get these results (patents, customer satisfaction, market share ...). There are two approaches (both with pros and cons):

- Incremental Approach
- Zero-based Budget (ZBB)

Incremental Approach

The budgeted period costs of year (t) are calculated on the costs incurred the previous year ($t - 1$)

$$\text{Budgeted Period Costs } (t) = \text{Actual Period Cost } (t - 1) * (1 + \alpha)$$

α is a coefficient that takes into account

- Inflation (you need more money to buy the same things)
- The expected growth of the company (also the period costs are expected to grow)

And it is typically more than zero. Therefore, the idea is that every year the period cost must increase

PROS: low cost of implementation (very simple)

CONS: amplifications of errors (una tantum expenses). You are assuming that the growth of each activity is the same, while they are different because each activity is different from the other.

α might be negative for two reasons. First, you know that your organizational units are not efficient and you want to challenge them by running the same things every year with lower budget. Second, you know that your organizational units are efficient but you want to oblige them to think out of the box to improve (continuous improvement – lean management).

Zero-Based Budget (ZBB)

The Budgeted Period Costs are redefined every year

Each Manager has to:

- Define the **minimum set of resources** required for running the Unit
- Propose additional “**packages**” of initiatives

PROS: the method is theoretically more precise

CONS: it requires high costs and time for implementation (and maybe causes conflicts)

Typically, companies run the ZBB only every 3 years, accepting the errors of the incremental approach in the meanwhile.

AFC Case Study

$$\text{Budgeted Period Costs (Sales)} = 4,800\text{€} + 2\% * 70,000 \text{€} = 6200\text{€}$$

$$\text{Budgeted Period Costs (Marketing)} = 4,300\text{€}$$

$$\text{Budgeted Period Costs (Administration)} = 5,000\text{€} + 2,000\text{€}$$

$$\text{Budgeted Period Costs (General)} = 5,000\text{€}$$

$$\text{Budget of Period Costs} = 22,500\text{€}$$

General costs include canteen, education, security, legal, and R&D costs.

Administration costs include HR, finance, IT, and top management.

HR means the cost of the HR function (the cost of employees who are employed for the HR function)

Budget of EBIT

The Chief Financial Officer knowing the budget of period costs can budget the operating margin (EBIT).

+ Budget of Revenues	+ 70,000€
- Budget of Cost of Goods Sold	- 39,060€
= Budgeted Gross Margin	= 30,940€
- Budget of Period Costs	- 22,500€
= Budgeted EBIT	= 8,440€

$$ROS = \frac{EBIT}{REVENUES} = \frac{8,440}{70,000} \cong 12\% < 15\% !!!$$

We should do the budgeting process **another round to meet the target**. It is better to squeeze the period costs as much as possible to meet the target. **Rule of thumb is that the period costs must not be more than 30% of revenues.**

Cutting down the period cost might be seemed as a fantastic solution in the short term but in the long term it is a disaster. There is no company without R&D. if you decrease the commissions to your salesforce, they will leave the company. You lose your competitive advantage over time.

Why the companies are still using bottom up approach (why CFO does not do the budgeting process himself/herself)? First, to engage managers, create motivation and commitment. In addition, to share the complexity of organizing the company, to show them their ideas and plans will not work, to show them their ideas are fantastic inside their organizational unit but not when it is shared with other units.

Second, you want to challenge your managers to go beyond their comfort zone. CFO is not able to go beyond this because he/she just know what the managers did in the past and he is not able to think what they could do in a different way. Because CFO is not knowledgeable about the processes, tasks, competences, market and so on. Therefore, the creativity cannot come from CFO. Instead, he/she can prepare some numbers to help the managers and direct their creativity.

D&A is spread here and in period cost.

D&A visible in income statement by nature.
we have EBITDA (proxy cash flow)

discuss with board.
changing scope, budget, ...
brainstorm to fix it!

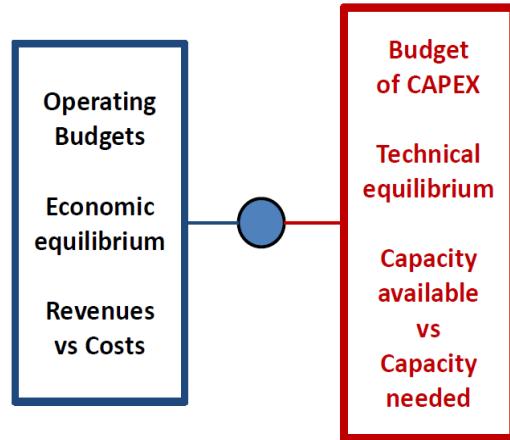
short term it's hard to optimize
cost of good solds and
modifying the sales and
prices. so we have to change
the period cost.

if the 12 was 4 so you have to
change completely!! it's high

CAPEX Budgets

Capital expenditures (CAPEX) are aligned with the concept of **technical equilibrium**. Therefore, we need to verify that the available capacity is aligned with the required capacity. Capital expenditure budgets is done at the same time with operating budgets. Because you cannot define the EBIT if you do not know the **available capacity and also depreciation.**

When you check both the economic and technical equilibrium, you move forward analyzing the financial budget. Because the financial budgets are defined through an indirect approach (starting from EBIT and move from income statement to the cash flow statement).



Partial income statement until EBIT \Rightarrow complete cash flow statement \Rightarrow back to the income statement to complete it \Rightarrow finally complete balance sheet

Master Budget

The Master Budget comprises:

- Operating budgets, which originate from the typical (characteristic) management of a business; they define the economic flows of raw materials, components, finished products, services
- Capital expenditure budgets, which define the use of financial resources for the medium-long period
- Financial budgets, which evaluate the impact of operating and investment plans on cash inflows and cash outflows

These documents are then used to prepare:

- Budgeted Income Statement
- Budgeted Balance Sheet
- Budgeted Cash Flow Statement

Budget of Capital Expenditures

It outlines amount and timing of capital expenditures.

Examples:

- Buying new equipment
- Acquiring new patents
- Building a new store
- Purchasing and installing a materials handling system

Capital expenditure budgets is useful in to verify the technical equilibrium and to provide cash outflows from investment in non-current assets for the cash budget (investing).

Why some of the investments are waiting to be approved? Because we are still missing the financial budget (cash). In addition, the evaluation of new investments is a time-consuming process.

The numbers in this table show the installments (not depreciations) that the company has agreed on to pay suppliers of technologies. With this table, we cannot have any idea about the lifetime and therefore, the depreciation of each purchased tangible or intangible asset.

Investments 3 & 4 are approved in 2021 and the company will start paying installments from 2022. Typically, the purchasing of new assets (tangible and intangible) occur in the first day of the financial year to simplify the depreciation calculation. In the table, the only value that is relevant is the sum of the **instalments that should be paid (cash outflow)** in 2022. This value could be modified during the budgeting process because there are still investments that are waiting to be approved. Moreover, the company may decide to change the technical configuration of its plant because it might not achieve **the expected EBIT**.

Capital expenditure budget is the result of capital budgeting techniques, that is the evaluation of investments to decide whether to approve them or not.

PORTFOLIO OF INVESTMENTS	Previous years	2022	2023	2024
<i>Approved in past years</i>				
- Investment 1	100,000	20,000	15,000	
- Investment 2	50,000	50,000	20,000	20,000
<i>Approved in the year</i>				
- Investment 3		80,000	40,000	20,000
- Investment 4		20,000	20,000	
Total Approved	150,000	170,000	95,000	40,000
<i>Waiting for approval</i>				
- Investment 5		75,000	125,000	100,000

AFC Case Study:

On 01/01/2022 the company will buy another equipment for €10,000 €, depreciation over 10 years. This asset will be paid as follows: €5,000 in 2022 and €5,000 in 2023.

On 01/01/2022 the company will buy an information system for production scheduling for 5.000 € that will be paid in the second semester of 2022. This investment will be depreciated over 5 years from 2022.

PORTFOLIO OF INVESTMENTS	2022	2023
<i>Approved in the year</i>		
New equipment	5,000€	5,000€
New information system	5,000€	
Total Approved	10,000€	5,000€

Financial Budgets (Cash Budgets)

The basic document is the cash budget, which aims at evaluating the budgeted inflows and outflows of the organization. There are two ways for calculating a cash budget:

- **Direct Approach** (this method is not used)

Registration line-by-line of future cash inflows and cash outflows

- **Indirect Approach**

From the **EBIT** by adjusting accrual principle into financial principle (transforming revenues to **cash inflows** and costs to **cash outflows**). The translation of the company's strategy first passes through the EBIT and then from the EBIT it moves toward cash flow statement.

The Cash flow Statement classifies cash inflows / cash outflows in three category:

- **Cash flow from operating activities**, i.e. cash flows generated by the operating, financial and fiscal activities. It refers to all activities in the income statement. In other words, it is the adjustment of the complete income statement.
- **Cash flow from investing activities**, i.e. cash flows generated by the acquisition or disposal of non-current assets (tangible and intangible)
- **Cash flow from financing activities** (it is the modification of the equity and liability statement), i.e. cash flows generated by changes in the equity capital (issuing new shares on the market) and financial debts (opening new financial debts with banks and bondholders or closing financial debts with them)

Budgeted Cash Flow Statement through an indirect approach

EBIT (t)
+ D&A (t)
+ Δ NET OPERATING WORKING CAPITAL = - Account Receivable (t) + Account Receivable (t-1) - Inventories (t) + Inventories (t-1) + Account Payable (t) - Account Payable (t-1)
+ Cash inflows from financial revenues (t) - Cash outflows from financial expenses (t)
- Paid Taxes (t)
= CASH FLOW FROM OPERATING ACTIVITIES (t)
+ Cash inflows from disinvestment in non-current assets (t) - Cash outflows from investment in non-current assets (t)
= CASH FLOW FROM INVESTING ACTIVITIES (t)
+ Cash inflows for increase in share capital (t) - Cash outflows from decrease in equity (e.g., dividends) (t)
+ Cash inflows for new financial debts/bonds (t) - Cash outflows for closing financial debts/bonds (t)
= CASH FLOW FROM FINANCING ACTIVITIES (t)

The final step is to evaluate the closing CASH availability to verify the financial equilibrium for the next 12 months.

Opening CASH (t) = Closing CASH (t-1)
+ CASH FLOW FROM OPERATING ACTIVITIES (t)
+ CASH FLOW FROM INVESTING ACTIVITIES (t)
+ CASH FLOW FROM FINANCING ACTIVITIES (t)
Closing CASH (t)

Note: Free cash flows are only the variation from the opening to the closing cash.

Budgeted EBIT comes from the operating budgets.

file number 15 - page 11

Depreciation is not only a product cost but also a period cost (we have depreciation in sales, marketing, general, and administration cost). For instance, in R&D, employees use laptops, chairs, and machineries that depreciate over time.

EBITDA is the main number in the income statement by nature, while the gross profit is the main one in the income statement by function. EBITDA is relevant for small and medium enterprises because they are not obliged to produce cash flow statement and this number is the best proxy for cash flow from operating activities.

EBIT includes the cost of goods sold and not the cost of production (accrual principle). In other words, we will produce 950 units but we sell 900 units (we have to pay for other 50 units). The income statement is completely blind on the variation of inventories. Therefore, cash flow statement must account that we are paying for these 50 units. This story is the same for raw materials.

As the company will not produce all the inventories in 2022 and the cost for part of it was paid in the past, we should add the inventories of 2021 to the cash flow statement to achieve the variation of inventories between the two years.

In reality, a portion of taxes is paid in the same year and the remaining part will be paid next year once the shareholders' assembly approves the financial reports. This is why we have unpaid taxes.

Cash flow from financing activities shows the variation of financial liabilities. Cash flow from operating activities indicates the financial costs (cash outflows) and financial income (cash inflows).

The case study does not provide information about planned disposals of non-current assets.

The case study does not provide information about planned increases in share capital. Typically, companies do not issue new shares frequently. Of course, it is frequent for young companies like startups.

The case study does not provide information about planned increases in debt capital.

The closing cash cannot be negative and therefore, we should run another round of the financial budget. When the closing cash is negative, the plan of actions is not feasible because we do not have a financial equilibrium. Financial planning refers to how companies can try to fix this situation with different instruments.

EBIT (t)	+ 8,440	
+ D&A (t)	+ 3,000	
+ Δ NET OPERATING WORKING CAPITAL =	- 1,770	
- Account Receivable (t) + Account Receivable (t-1)	- 2,500	
- Inventories (t) + Inventories (t-1)	- 2,020	
+ Account Payable (t) - Account Payable (t-1)	+ 2,750	
+ Cash inflows from financial revenues (t)	+ 600	
- Cash outflows from financial expenses (t)	- 1,200	
- Paid Taxes (t)	- 4,520	
= CASH FLOW FROM OPERATING ACTIVITIES (t)	+ 4,550	
+ Cash inflows from disinvestment in non-current assets (t)	0	0
- Cash outflows from investment in non-current assets (t)	- 10,000	- 10,000
= CASH FLOW FROM INVESTING ACTIVITIES (t)	- 10,000	in A&L it increase 15000, as it's accrual
+ Cash inflows for increase in share capital (t)	0	
- Cash outflows from decrease in equity (e.g., dividends) (t)	- 1,000	
+ Cash inflows for new financial debts/bonds (t)	0	
- Cash outflows for closing financial debts/bonds (t)	- 2,000	
= CASH FLOW FROM FINANCING ACTIVITIES (t)	- 3,000	

Opening CASH (t) = Closing CASH (t-1)	+ 2,000
+ CASH FLOW FROM OPERATING ACTIVITIES (t)	+ 4,550
+ CASH FLOW FROM INVESTING ACTIVITIES (t)	- 10,000
+ CASH FLOW FROM FINANCING ACTIVITIES (t)	- 3,000
Closing CASH (t)	- 5,850

One of the simplest ways to fix this situation is to cover cash unbalance with new bank debt.

+ €10,000, 10% *interest rate, duration: 3 years*

We assume that the new debt is not changing $K_d = 10\%$.

Now we need to adjust the previous forecasts considering the new bank debt.

Because of the additional financial interest, the company will pay less tax (tax shield).

Opening CASH (t) = Closing CASH (t-1)	+ 2,000
+ CASH FLOW FROM OPERATING ACTIVITIES (t)	+ 4,050
+ CASH FLOW FROM INVESTING ACTIVITIES (t)	- 10,000
+ CASH FLOW FROM FINANCING ACTIVITIES (t)	+ 7,000
Closing CASH (t)	+ 3,050

CASH BALANCE!!! There is a financial equilibrium

EBIT (t)	+ 8,440
+ D _t Additional financial expenses = - 10,000 * 10% = - 1,000	+ 3,000
+ Δ _t	- 1,770
- Ac _t Financial expenses = - 1,200 - 1,000 = - 2,200	²
- Inv _t	
+ Account Payable (t) - Account Payable (t-1)	
+ Cas _t Unpaid taxes = 600	+ 600
- Ca _t	- 2,200
- Pa _t tax rate = 50%	³ - 4,020
= Ca _t	
EBT = EBIT – net financial interests	
+ Ca _t	0
- Ca _t EBT = 8,440 – (2,200 – 600) = 6,840	adjust tax - 10,000
= Ca _t	- 10,000
Taxes = 6,840 * 50% + 600 = 4,020	
+ Cash inflows for increase in share capital (t)	0
- Cash outflows from decrease in equity (e.g. dividends) (+)	- 1,000
+ Cash inflows for new fin.	
- Cash outflows for closing	
New bank debt = + 10,000€	¹ + 10,000
	- 2,000
= CASH FLOW FROM FINANCING ACTIVITIES (t)	

Why we are including the cash outflows of financial interests in the cash flow from operating activities? First, because this is a standard defined by IAS regarding the structure of cash flow statement. Second, the idea about the cash flow from operating activities is that how the company is able to generate cash through the business activities.

The main idea of the BCG matrix is that the company should be able to sustain the investments (CAPEX) only through the operating activities (you cannot use leverage and it should be equal to zero). In other words, the cash flow from operating activities should be superior to investing activities. In our case, the company sustains the growth strategy by leveraging and is not able to sustain its growth strategy with the operating activities (question mark). Therefore, we can see the inner mechanism of the BCG matrix in the last table of previous page.

The cash flow statement does not highlight the situation of sub-periods across the year (e.g. if cash inflows concentrated at the end of the year, the company will have problem of liquidity at the beginning of the year). In other words, we can claim that the company has cash balance as an average of the year, but we have no idea about the cash balance per quarter or per month.

We can define different cash budgets detailing the situation throughout the year (e.g. per semester, per quarter, per month). Outside of academia, the term cash budget refers to cash flow statement for periods shorter than a year, and the term financial budget refers to cash flow statement for one year.

Note: We cannot complete the budgeted income statement before budgeted cash flow statement because we do not know the financial expenses, which is defined after checking the financial equilibrium.

The last step in the Master Budget is drafting the complete Budgeted Financial Statements:

- Defining Cash flow Statement (done)
- Completing Income Statement
- Defining Balance Sheet

Once we have all Budgeted Financial Statements, we will apply Financial Analysis through Ratios/Absolute Indicators to verify that the plan of action will meet shareholders' goals.

Note: The main idea for DSO and DPO is that sales and purchases are homogeneously distributed over the year.

Budgeted Income Statement

+ Revenues	+ 70,000
- Cost of Goods Sold	- 39,060
= Gross Margin	+ 30,940
- Period Costs	- 22,500
= EBIT	+ 8,440
+ Financial revenues	+ 600
- Financial costs	- 2,200
= EBT	+ 6,840
- Taxes (50%)	- 3,420
= Net Profit	+ 3,420

Budgeted Balance Sheet

Non current Assets (t) = Non current Assets (t - 1) + New non current Assets (t) - D&A (t)

$$25,000 + \mathbf{10,000} + \mathbf{5,000} - 3,000 = 37,000$$

The balance sheet is build up on the accrual principle (matching principle). Therefore, we should consider the full value of new purchased or leased assets in the balance sheet.

$$\text{Bank Debts (t)} = 8,000 + 10,000 = + 18,000 \quad \text{New bank debt for 10,000}$$

$$\text{Bonds (t)} = 4,000 - 2,000 = + 2,000 \quad \text{Repayment of bonds for 2,000}$$

$$\text{Payables (t)} = 5,750 + 5,000 = 10,750$$

Trade payables + payables due to the supplier for the new equipment (an installment in 2023)

$$\text{Reserves (t)} = 7,400 + 1,000 = 8,400$$

$$\text{Retained earnings} = \text{Net profit (2021)} - \text{Dividends (2022)} = 2,000 - 1,000 = 1,000$$

Note: Another term for retained earnings is the profit brought forward. Retained earnings are portions of the profits from previous years that have not distributed among shareholders yet.

Note: You first produce the budgeted cash flow statements for at least 3-5 years (calculated cash inflows and outflows) and once it will be approved, you reshape the cash inflows and outflows to calculate FCFE and FCFF (equity and enterprise value).

ASSETS		EQUITY & LIABILITIES	
Non-current Assets	+ 37,000	Shared Capital	+ 24,000
Non-current financial assets	+ 3,000	Reserves	+ 8,400
Receivables	+17,500	2022 Profit	+ 3,420
Inventories	+ 6,020	Bank debts	+ 18,000
Cash	+ 3,050	Bonds	+ 2,000
		Payables	+ 10,750
Total Assets	66,570	Equity & Total Liabilities	66,570

$$ROA = \frac{EBIT}{ASSETS} = \frac{8,440}{66,570} \cong 12,7\% > 10\%$$

Financial Planning

The aim of financial planning is to understand how to manage and cover a company's financial needs, so how to find money and resources. The resource collection could happen in two different markets:

The **equity market**, that helps companies obtaining financing through the **issuance of shares** and in general terms of equity; it is the market referred to the shareholders, so the individuals and entities who own our shares in the company.

The **debt market**, where financers lend money to a company, which is then obliged to remunerate them and reimburse them according to an established contract. Debt holders do not own the company, they do not participate in the company, in fact, they are outside entities that finance the company with a contract in which we settle the time and the interest they let on the money they lend us. **The contract provides an obligation for the company.**

How a bank defines interest on loans? Using refinancing rate that is provided by the central bank of the country where the bank is situated. Refinancing rate is the money that will be required if the bank ask the money to the central bank of the country (the starting point for the interest rate). For instance, the refinancing rate in Russia is 7% and therefore, the interest rate for all bank loans in this country start from 7% on for companies. Another example is the US that has refinancing rate of 1% and therefore, the interest rate for all bank loans in this country start from 1% on for companies.

Of course, the interest rate on a loan is also depend on the type of the company, the amount of the loan itself, guarantees that the company is providing to the loan.

A bank or group of banks can give **bridge bank loan** to the company that is waiting for the confirmation of a long-term loan. **Sometimes bridge bank loan is given to the company before the syndicated bank loan.** It means that before the company get the final approval from all the banks, it may be given a portion of the money to start its activity. After the company get the final confirmation, it will be given the whole sum.

Bank loans

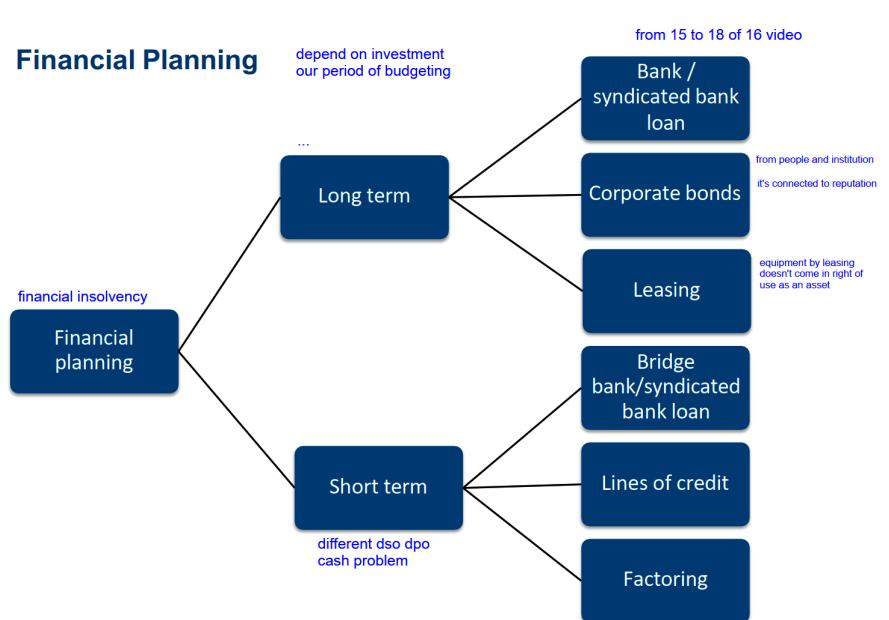
maturity date: the day we repay all the amount and the interest

Bank loan is a debt provided by a bank to the company. Can be either long or short term, depending on the maturity.

The **Interest** to be paid to the bank can be **fixed** or can be **floating (variable)**:

Fixed rate: the interest rate is the same for all the duration of the loan;

Floating rate: the interest rate changes over time depending on indexes defined in the debt market (e.g. Euribor). The formula or indexes used to determine floating rate would be defined within the contract (according to the overall market situation).



The **maturity** of the loan is the date at which the company has to repay all the interests and the whole amount of the loan to the bank. It is the contractual term of loans.

Repayment Scheme (contractually defined)

Scheduled repayment of interests: monthly, quarterly, semiannually, annually It rarely happens that the company repay the entire interests amount at the maturity date.

Scheduled repayment of capital:

- Bullet: the repayment of capital is at maturity date
- Amortized: the repayment of capital is amortized over time

Priority in case of default

Priority in the repayment of interests and capital; debtholders have the priority on equity holders.

Note: Bank loans (and syndicated bank loans) require warranties (what the company will give to the bank if it is not able to repay the debt).

Mortgage: a legal arrangement where you borrow money from a financial institution in order to buy land or a house, and you pay back the money over a period of years. If you do not make your regular payments, the lender normally has the right to take the property and sell it in order to get back their money

Note: A specific category of bank loan is mortgage that is a form of guarantee, which is constituted by real estates. In cases the borrower fails in respecting its obligations, the bank can recoup the potential losses through the mortgage. Nevertheless, the bank does not acquire the property of the mortgage but can sell it on the market.

Note: The issue of a long-term loan implies other costs such as the negotiation costs, evaluation of the mortgage value, insurance premia. also add administrative costs, insurance, ...

Syndicated bank loans

provided by several banks, the amount of money is so big, is not affordable for only one bank

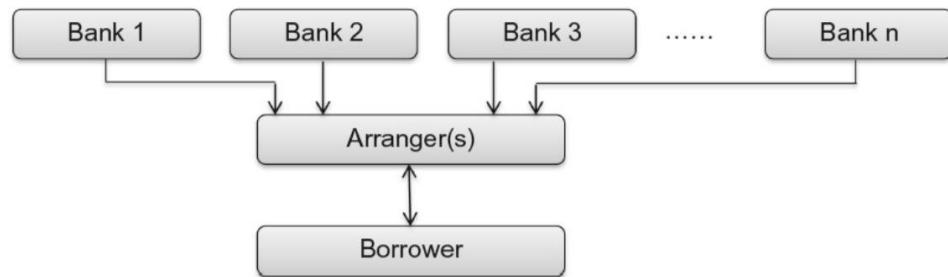
The syndicated bank loan is a specific type of bank loan in which the company asks money to financial institutions but the amount of money it requires is so big that it needs a pool of banks. We need more than one bank providing altogether the required amount. These loans are usually related to big merger and acquisition or big constructions. In the case of syndicated bank loan, we need a more complicated arrangement since we need more banks to lend the money. Therefore, we need intermediary institutions (arrangers), which become an aggregator between the banks and the company.

A syndicated loan is provided by a group of lenders. It is structured, arranged, and administered by one or several commercial or investment banks known as arrangers.

The aim is to lend money to a borrower with a unique contract with all the banks. This allows the partition of credit that a stand-alone bank could not disburse. Moreover, banks share the risk of such big cash outflow. In addition, the contract for this type of loan is much more rigid than a normal contract of bank loan because it is unlikely to renegotiate on the maturity date or anything else. It is very difficult to rearrange several banks to make a change in the contract.

Arrangers could be banks or financial organizations that are knowledgeable about companies and banks.

Interest rate, maturity date, and repayment of interest and loan for syndicated bank loans are similar to bank loans.



Bank loans: concluding remarks

	Bank Loan	Syndicated Bank loan
Characteristics	Loans are contractually defined and negotiated between the firm and the bank	Loans are contractually defined and negotiated between the firm and the consortium of banks
Emission	Financial intermediaries are not fundamental A loan emission requires transparency and disclosure between the firm and the bank. The process is fast.	The arranger(s) manage the syndicated loan emission. The process is time-consuming. A loan emission requires transparency and disclosure between the firm and the banks
Costs	The cost for the company are the interest payment and reimbursement of capital. There is an additional cost for the signature of the contract. The transaction costs are lower than a syndicated loan.	The cost for the company are the interest payment and reimbursement of capital A company also have to pay arranger(s). The transaction costs are higher than a bank loan
Benefits	The loan is customized (according to the requirements of a company) and can be renegotiated more easily than syndicated loans.	The loan is customized (according to the requirements of a company) but it can be renegotiated less easily than bank loan.

Corporate bonds

A bond is a financial instrument with two parties, the company and an individual/organization ready to buy the bond. The bond is similar to the bank loan since we have an interest, a specific payment and a maturity date. They can be issued to other organizations or to individuals (usually we have a mix).

Corporate bonds are most likely long-term debts (more than 12 months period). However, very few companies can permit themselves to make corporate bonds for 12-month period (e.g. LVMH).

A bond is a security that requires the issuer (i.e. company) to pay specified interests (coupons) and make principal payments to the bondholders at maturity or even on specified dates. The bond emission can be targeted to:

- Institutional investors
- Retail investors
- Both

COUPON	<ul style="list-style-type: none"> • Interest to be paid to bondholders
MATURITY	<ul style="list-style-type: none"> • Contractual term or settlement of bonds
REPAYMENT SCHEME	<ul style="list-style-type: none"> • Scheduled repayment of interests: monthly, quarterly, semiannually, annually ... • Scheduled repayment of capital: <ul style="list-style-type: none"> • Bullet: the repayment of capital is at maturity date • Amortized: the repayment of capital is amortized over time
PRIORITY IN CASES OF DEFAULT	<ul style="list-style-type: none"> • Priority in the repayment of interests and capital; bondholders have the priority on equity holders

Corporate bonds types

Hybrid security: Instead of requesting the repayment of capital at maturity date, bondholders have the possibility (and not the obligation) to convert their bonds into the shares of the company. In this way, the share capital of the company will increase (acquisition of new shareholders). It is written within the bond contract that what is the equivalent of one bond comparing to the shares. It should be noted that before the conversion process or taking back their money, the bondholders were received the interests of the bonds (coupons) based on the scheduled dates. Coupons for hybrid security is lower than the coupons for debt security.

Debt security: pure debt bonds, they have financial interest (coupon);

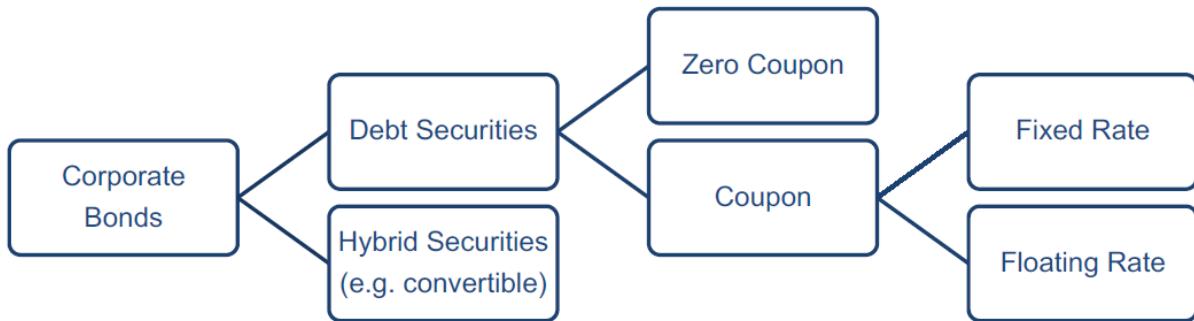
- **Zero coupon:** the bond pays no coupon or interest (this is unlikely for corporate bonds). A zero-coupon bond is a debt security that does not pay interest but instead trades at a deep discount, rendering a profit at maturity, when the bond is redeemed for its full face value. In other words, the difference between the purchase price of a zero-coupon bond and the par value indicates the investor's return.

Zero coupon bonds can be used as financial instruments to hedge, whenever the company requires having operations in another currency. cover risks

- **Coupon:** the bond pays coupons over time.
 - **Fixed rate coupon:** the amount of coupon is contractually defined.
 - **Floating rate coupon:** the algorithm for computing the coupon is contractually defined (according to the overall market situation and performance of the company itself).

Note: There is a direct connection between coupon and credit rating of a company. Higher the credit rating of a company, lower the interest rate (coupon) of bonds and vice versa. In other words, the more reliable a company, the less return you will expect and vice versa.

Note: Usually companies that has very good reputation on the market issue bonds. The companies that are not listed can also issue bonds (of course, not hybrid security).



Corporate bond emission



The main difference between bank loan and corporate bond is the fact that bonds need **intermediaries (Consortium)** that help the company through this procedure. **There are three types of actors: Underwriting Group, Selling Group, and Agent Bank.** These actors prepare **the bond contract, thus defining the value of each bond and the rate and type of the coupon.** Moreover, they **decide on the amount of bonds that should be issued**, providing those bonds to the investors. Then investors acquire the bonds and provide the money to the company.

Selling group arranges to sell shares to investors and **underwriting group** agrees to buy any shares that are not bought by them.

Company will provide the coupon payments and the capital payment through the agent bank to the investors at the maturity date of the coupons and the capital itself.

Note: Comparatively to Bond, the **bank loan interest rates** in most of the cases are **higher**, while **administrative expenses for issuing bonds** are **higher than borrowing bank loan**.

Corporate bonds: concluding remarks

	Corporate Bonds
Characteristics	<ul style="list-style-type: none"> Bonds are standardized and address a plurality of investors Bonds' characteristics are contractually defined by the issuer (no negotiation between the issuer and bondholders)
Emission	<ul style="list-style-type: none"> Financial intermediaries are fundamental for a bond emission. The process is time-consuming. A bond emission requires transparency and disclosure between the firm and the market.
Costs	<ul style="list-style-type: none"> The cost for the company are the coupon payment and reimbursement of capital. High transaction costs (e.g. fees, administrative, disclosure, marketing etc.). Bond emission cannot be renegotiated (maturity date, coupon type, etc.). Bond emission is therefore affordable for investment-grade companies with a sound reputation.
Benefits	<ul style="list-style-type: none"> Bond emission allow the company to access a more extensive and liquid market

Leasing

A lease is a contractual agreement between a lessee (user = company) and a lessor (the owner of the asset). **The lease is targeted to a specific asset.**

It gives the **right to the lessee to use an asset for a period, making periodic payments to the lessor.**

The lessor could be the asset manufacturer or an independent leasing company that buys the asset from the manufacturer and leases it out.

Maturity: Contractual term or settlement of the lease

Repayment Scheme: Scheduled rent: monthly, quarterly, semiannually, annually

Operating Leasing

An operating or service lease is usually signed for **a period much shorter than the actual life of the asset.**

The asset is generally **standardized** and therefore, it can be **easily transfer from one lessee to another with slight modifications in the asset** (e.g. airplane ...).

At the end of the life of the lease, the equipment reverts to the lessor, who will offer to either sell it to the lessee or lease it to somebody else. **The lessee usually has the option to cancel the lease and return equipment to the lessor (with fine).**

The ownership of the asset resides with the lessor, with the lessee bearing little or no risk if the asset becomes obsolete. The lessee **pays the rent** but **installation, maintenance, insurance, and other costs are on the behalf of lessor.**

dimension of the company will be smaller! in balance sheet: less assets

Summary of IFRS 16

right of use - leased! it is an asset

Objective

IFRS 16 establishes principles for the recognition, measurement, presentation and disclosure of leases, with the objective of ensuring that lessees and lessors provide relevant information that faithfully represents those transactions. [IFRS 16:1]

Accounting by lessees

Upon lease commencement a lessee recognises a right-of-use asset and a lease liability. [IFRS 16:22]

The right-of-use asset is initially measured at the amount of the lease liability plus any initial direct costs incurred by the lessee. Adjustments may also be required for lease incentives, payments at or prior to commencement and restoration obligations or similar. [IFRS 16:24]

Under the cost model a right-of-use asset is measured at cost less accumulated depreciation and accumulated impairment. [IFRS 16:30(a)]

Example: Operating Lease

The overwhelming majority of major airlines do lease at least some of their aircraft. Leasing allows airlines with weak balance sheets or with poor future prospects to increase capacity without locking capital. This aircraft resell value is an important aspect to consider when comparing leasing vs purchasing, as well as tax incentives derived from amortization.

Finance Leasing

Finance lease generally lasts for the life of the asset. The asset is generally less standardized than operating lease (**more customized**) and is generally instrumental to the lessee business. In most cases, lessor is the manufacturer of the asset, which is customized for a specific lessee.

At the end of the life of the lease, the equipment reverts to the lessor but it is generally redeemed by the lessee. **A financial lease generally cannot be canceled.**

In many cases, the lessor is not obligated to pay insurance and taxes on the asset, leaving these obligations up to the lessee. **A finance lease imposes substantial risk on the shoulders of the lessee.**

Finance leases exist when the financial risks and benefits associated with the ownership of an object are essentially transferred from the lessor to the lessee, regardless of the fact that the legal ownership lies with the lessor. **Assets held under finance leases are reported as non-current assets and future payment commitments were reported as liabilities in the balance sheet.**

Leasing: concluding remarks

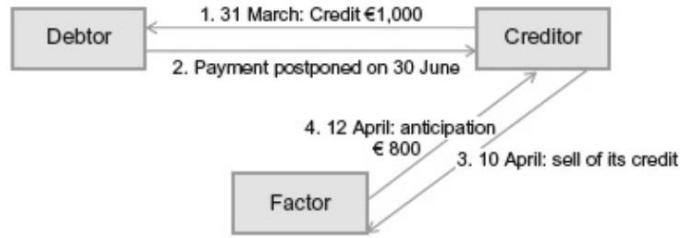
		Operating Lease	Finance Lease
Characteristics		<ul style="list-style-type: none"> The leased property is usually standardized The maturity of lease is shorter than the life of the asset The lessor has the legal ownership of the asset and is in charge of installation and maintenance costs as well as other risks and charges. 	<ul style="list-style-type: none"> The lessee fund the availability of a good instrumental to its business (not as standardized as the operating lease) The maturity of lease is generally equal to the life of the asset The lessor has the legal ownership of the asset. The lessee is in charge of all other costs and risks
Emission		<ul style="list-style-type: none"> The lessee tends to renovate the contract or return the asset to the lessor (typically the redemption of the asset is not common) 	<ul style="list-style-type: none"> At the end of the contract the lessee usually redeems the asset
Costs		<ul style="list-style-type: none"> The cost for the company is the rent 	<ul style="list-style-type: none"> The cost for the company is the rent and the amortization, interest and costs/fees to provide to the locator
Benefits		<ul style="list-style-type: none"> The leasing allows to avoid the disbursement of the whole amount of investment to purchase the asset The administrative procedures are simpler for leasing than for a bank loan The leasing debt amortization is more flexible than the one of loans since it allows to model the debt service on the cash flow pattern 	

Factoring

Factoring is a credit service that concerns the acquisition of commercial credit by an intermediary (factor) in order to receive advance payments. **When a company has receivables**

and need money, it sells credits to the (factor) in order to collect money in advance, without waiting for the maturity of the receivables. The factor pays a percentage to the counterparty as soon as it receives an assignment or the receivable.

The creditor gives €1000 to a debtor that will pay back after three months of delay. The creditor decides to receive an anticipation of the debt from the factor with a discount (€200 is), where the discount is equal to the interest payment to the factor.



Interest is related to the percentage of discount on the face value of the commercial credit.

Maturity is contractually defined between creditor and factor.

Repayment Scheme: Scheduled repayment the day the debtor is supposed to pay.

The factoring agreement can be:

With recourse (guarantee):

The credit risk is on the creditor firm under reserve i.e., the factor requires the return of anticipated amounts to the party who sells the credit in case the debtor does not fulfil its duties at maturity.

Without recourse:

The factor assumes the insolvency risk. In this case, the factoring cost for the creditor is comprehensive of this risk analysis, and in the case of insolvency, the factor cannot recoup costs from the client who gives the credit. This arrangement is a protection against bad debt quality, even if it is not costless (higher percentage of discount compared to the situation with recourse because the risk for the factor is higher).

Factoring	
Characteristics	<ul style="list-style-type: none"> Factoring is contractually defined
Emission	<ul style="list-style-type: none"> Financial intermediaries are not fundamental Factoring requires transparency and disclosure between the firm and the factor. The factor should have information not only on the company but also on the debtor in order to easily value its insolvency risk
Costs	<ul style="list-style-type: none"> The cost for the company equals the discount on the face value of the commercial credit There are some transaction costs (e.g. fees, administrative, disclosure, etc.) Factoring is affordable not only for investment-grade companies with a sound reputation but for any type of companies Without recourse factoring bears a higher discount percentage on the value of the credit due to the debtor insolvency risk
Benefits	<ul style="list-style-type: none"> Factoring allows the company to have liquidity instead of waiting for the natural maturity of receivables In case of a factoring without recourse, the company does not suffer the risk of insolvency of the debtor

Why should I give my receivable to a factor in the first option? We can have cash in the short term, but also, factors are better at getting receivables, they have more strategies into doing that. The factor is pushy in getting back the receivable.

Lines of credit like the credit card! for 100K € per month

A line of credit is an available amount of money that a firm can borrow, in case of need. It is a very flexible option of financing.

It should be used for covering short-term cash imbalances due to the mismatching of operating cycle inflows and outflows (it should not be used for investment activities); otherwise, it will become a very onerous obligation. The interest rate is very high.

INTEREST	<ul style="list-style-type: none"> Interest to be paid to the bank <ul style="list-style-type: none"> Fixed rate
MATURITY	<ul style="list-style-type: none"> No contractual maturity
REPAYMENT SCHEME	<ul style="list-style-type: none"> Scheduled repayment of interests: monthly, quarterly, semiannually, annually ... Repayment of capital: is not scheduled but it is amortized over time
PRIORITY IN CASE OF DEFAULT	<ul style="list-style-type: none"> Priority in the repayment of interests and capital; debt holders have the priority on equity holders

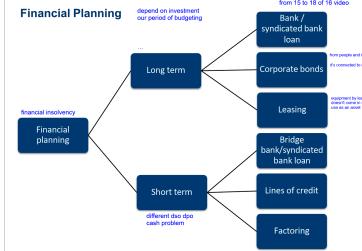
Note: Usually the company can ask a bank to open a line of credit for it throughout the year by **paying an annual fee (like a credit card)**. Then, the company pays interest to the bank over the money it used. Moreover, there is a possibility to not pay any interest cost, if the company **repay the used money to the bank in a month**. It should be noted that if the company does not use the credit, there would be no effect on its financial statements.

It is quite usual to have access to different credit lines because this multiple access could turn to generate a positive effect on the company liquidity in case of unpredicted situations in cash flows.

The amount of money generated from the **line of credit is much smaller than bank loans or bonds**. However, it is available for any type of companies.

Lines of credit: concluding remarks

Lines of credit	
Characteristics	<ul style="list-style-type: none"> It is a very flexible solution to manage cash inflows and outflows There is not a contractually defined maturity
Emission	<ul style="list-style-type: none"> Lines of credit are managed between the bank and the firm
Costs	<ul style="list-style-type: none"> The interest rate is very high in comparison with other forms of financing There could be some fees related to the maximum amount borrowed
Benefits	<ul style="list-style-type: none"> It is a very flexible form to manage liquidity It takes not a long period of time to have access to the line (i.e. days)



Exercise 1

Company JOY is preparing the budget for the accounting year 2021 (January-December 2021). While preparing the cash budgets, they realize that they will have a problem of cash in 2021. They consider to fix this problem with a bank loan of €20,000 with a duration of five years to be activated on January 1st, 2021. The bank offers to JOY different possibilities in terms of interest rate (always fixed), repayment of debt and commissions. There are three possibilities (A, B, and C).

OPTION A

- Annual fixed interest rate: 10%
- Commission: 3,200
- Repayment of debt: bullet (at maturity date)

OPTION B

- Annual fixed interest rate: 5%
- Commission: 200
- Repayment of debt: amortized

درصد رو روی باقیمانده میدیم ۵!!!!

OPTION C

- Annual fixed interest rate: 6%
- Commission: 0
- Repayment of debt: amortized

اکش فلو در انتها سال اول رو حساب میکنه در نتیجه هیچ فرقی بین سال اول این ۳ مورد نیست حالا میریم مرحله بعد برای حساب کردن کاش ... هدف اینه کل کاست او دیت رو کمتر بشه که جم اینترست و کامویشن هست.

For all the three options:

- The payment of the debt interest will start in January 2021.
- The commission is upfront and must be paid the 1st January 2021, at the activation of the bank loan.
- In case of amortized loan, the amortization is linear (equally divided across the 5 years), starts in 2021 and the annual repayment done at the end of the year.

What is the influence in terms of the cash flow; which option is the best one that will provide more cash in 2021 for the company?

In all three options, the cash in will be €20000.

Cash out in option A: $20000 * 10\% + 3200 = 5200$

Cash out in option B: $20000 * 5\% + 200 + \frac{20000}{5} = 5200$

Cash out in option C: $20000 * 6\% + 0 + \frac{20000}{5} = 5200$

In all three options, the cash flow from the loan in 2021 will be $20000 - 5200 = 14800$

Note: Every year, in the option B & C, the interest rate will be calculated according to the remaining part of the loan since they are amortized.

EX) option B $\Rightarrow 2022 \Rightarrow \text{interest rate} = 5\% * (20000 - 4000) = 800$

Interest in option A will be applied to the full amount of the loan

Note: Commission is due to the arrangement of the contract and usually is paid within the first year with a single instalment.

file 17: Exercises

Exercise 2

Which of the following statements regarding the lines of credit as a financing option is CORRECT?

- a) Lines of credit are the less expensive among short term financing possibilities
- b) Lines of credit are a good instrument for investment activities
- c) Lines of credits are used mostly to cover short-term imbalances (i.e. short-term liquidity needs)
- d) Interest rates of line of credits are always floating

Exercise 3

Which of the following statements about leasing contracts is TRUE:

- a) Leasing contracts can be distinguished into two types: with recourse or without recourse
- b) The choice of a company of resorting to a leasing contract (instead of buying a new asset) impacts the calculation of the WACC
- c) At the end of the life of the leasing contract, the equipment reverts back to the lessee
- d) The lessee will have to record in its income statement the payment of the leasing rent

Exercise 4

Working as a financial auditor, you came across the 2022 budgeted cash flow statement of one of your clients (company Gamma). In particular, the expected Total Net Cash Flow (i.e., the sum of cash flows from operating activities, investing activities, and financing activities) for 2022 is negative and equal to € - 1,000,000. You also know that the company is expected to end the current year (2021) with about € 300,000 of liquidity (i.e., cash and equivalents). Based on this information, which one of the following statements is TRUE?

- a) The company is going to face a liquidity issue in 2022, and the CFO should definitely ask for a long term loan (or, alternatively, for new capital from shareholders) to fix this issue
- b) The company is going to face a liquidity issue in 2022, and the CFO should ask for a short-term loan
- c) The company is going to face a liquidity issue in 2022, but there is not enough information to choose between the potential funding alternatives
- d) There will be no liquidity issue in 2022

We choose option c because we do not know from where this imbalance comes from. If it is arisen from operating activities and the company will make better results in the next year, we can cover this cash imbalance with short-term loan. If it is arisen from big investing activities (e.g., buying new assets), we should cover this cash imbalance with long-term loan in order to meet the instalments.

Exercise 5

Consider bank loans of a duration of five years, which of these sentences is CORRECT:

- a) If the bank loan has fixed rate and amortised repayment scheme, the financial costs included in the profit and loss account over the five years are always the same
- b) If the bank loan has a floating rate and bullet repayment scheme, the financial costs included in the profit and loss account over the five years depend on an underlying index.
- c) If the bank loan has a floating rate, the financial costs are always higher at the first year compared to the fifth year, regardless the repayment scheme chosen.

- d) If the bank loan has a bullet repayment scheme and an amortized repayment scheme and a fixed rate, the cash inflow at year 1 is always equal to the cash outflow at year 5.

Exercise 6

Company XYZ Ltd would like to improve FCFE and at the same time protect against some account payables bearing a risk of insolvency. Which solution do you suggest to the company? Assume everything not stated to be constant.

- a) Ask for a financial leasing
- b) Ask for a factoring with recourse
- c) Ask for a factoring without recourse
- d) None of the previous answers**

A = improve the FCFE (increase debt) but it will not solve the problem with account payables.

B & C = have negative impact on FCFE but they could solve the problem with account payables (through receivables)

Value Drivers & SCORECARDS

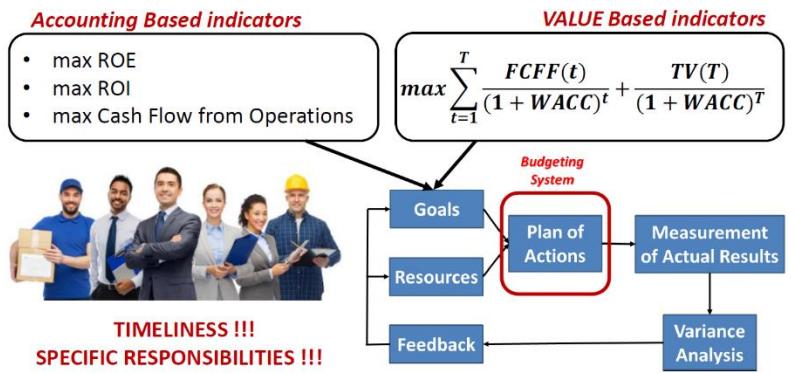
Enterprise Value (EV) and Day-by-Day

The following cycle is the plan and control cycle where we have goals and resources together with the risks in order to develop the plan of actions.

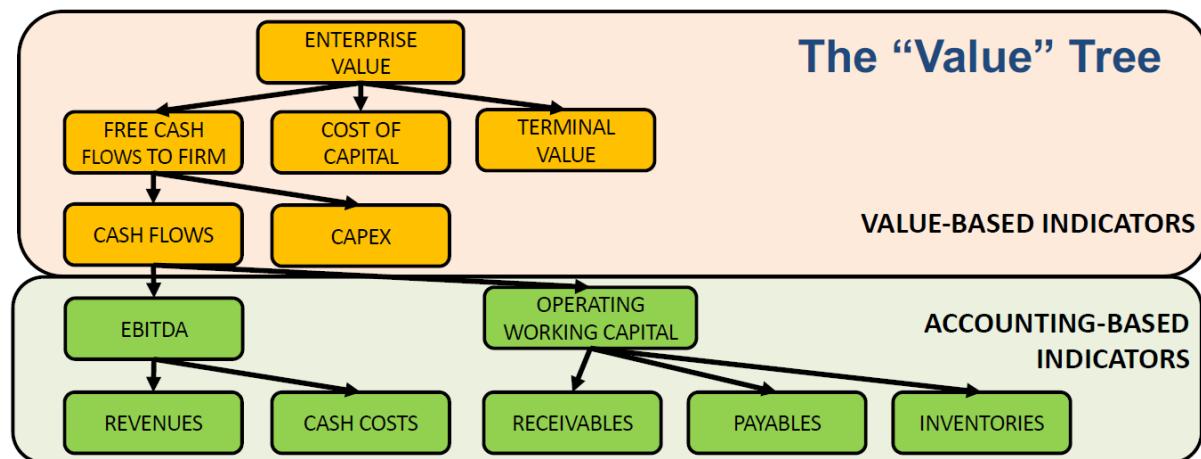
Based on value-based indicators, one of the most important goals is the maximization of the enterprise value. Increasing the enterprise value may bring opportunities for the company at the market in which it operates.

Based on accounting-based indicators, another important goal of the company is to enhance the profitability, which means maximizing the ROE, ROI and cash flow from operations.

Can we individualize that who is responsible for achieving these results within the company? CEO and CFO are responsible but their information and knowledge of the situation within the company is not enough to determine what is good for the company.



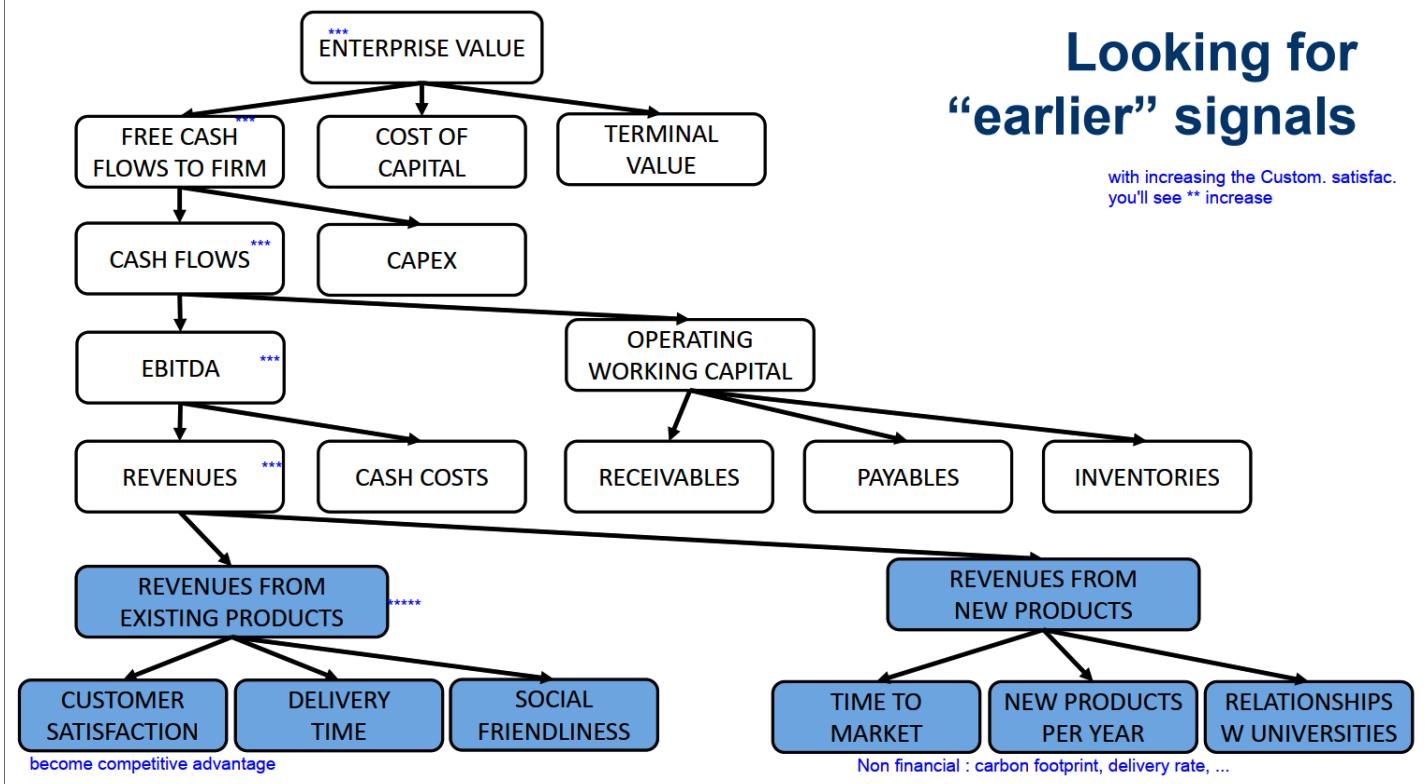
Value driver analysis: it can be carried out with several methods, one of them is the **Value Tree** that relates directly value drivers to cash flow generation."



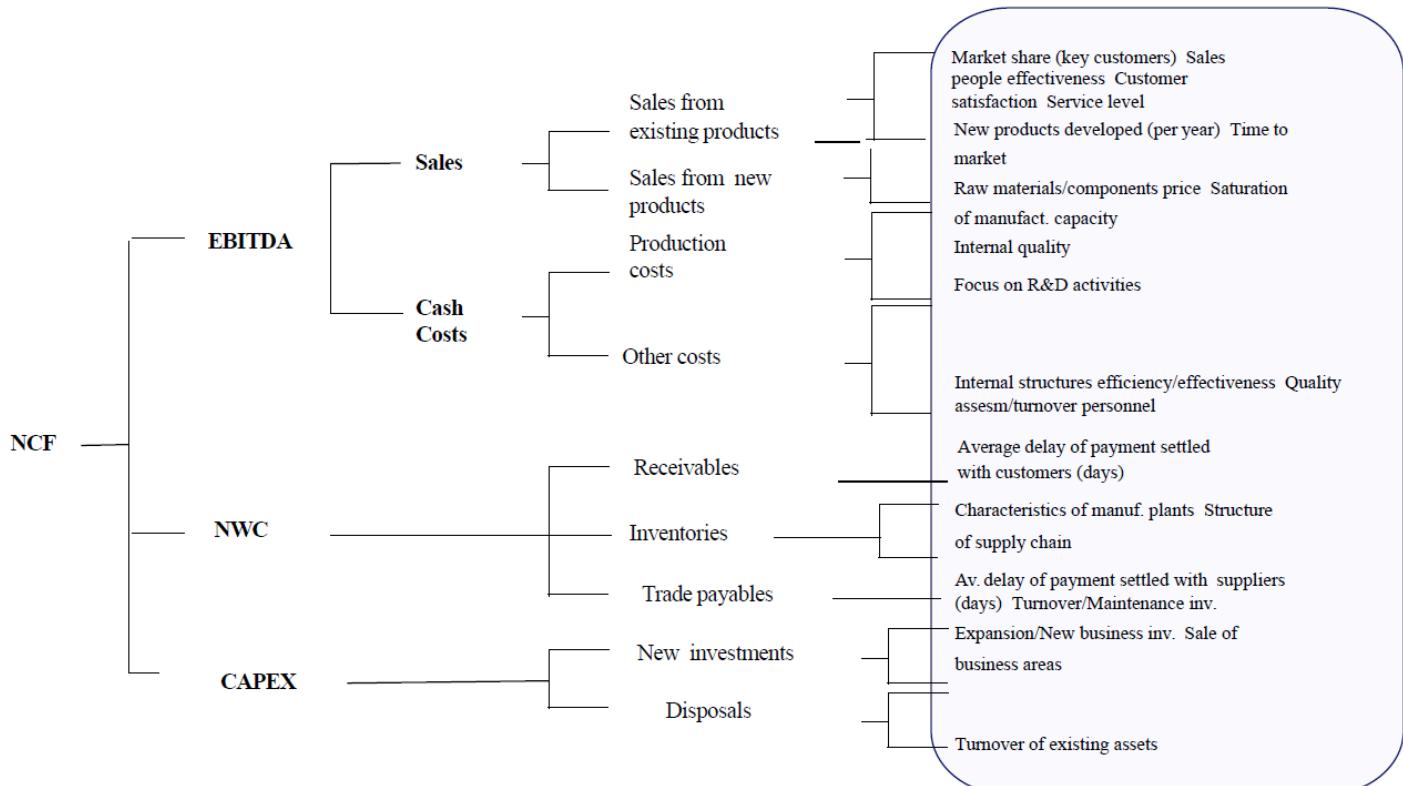
In the following figure, some predictors of revenues called **earlier signals** is shown. For instance, if we identify that the customer satisfaction for existing products is decreasing, we can predict that most likely the revenues and consequently the enterprise value will go down. However, knowing this fact, the company can take actions to prevent from reduction in enterprise value. According to the earlier signals, we are able to identify the causes of a distance between actual results and goals (variance analysis). Earlier signals or value drivers can help the company to predict indicators and to take corrective actions at a proper time. In order to get better results from the analysis of value drivers, it is important to compare them with the overall market, direct competitors, and previous performances of the company itself.

Looking for “earlier” signals

with increasing the Custom. satisfac.
you'll see ** increase



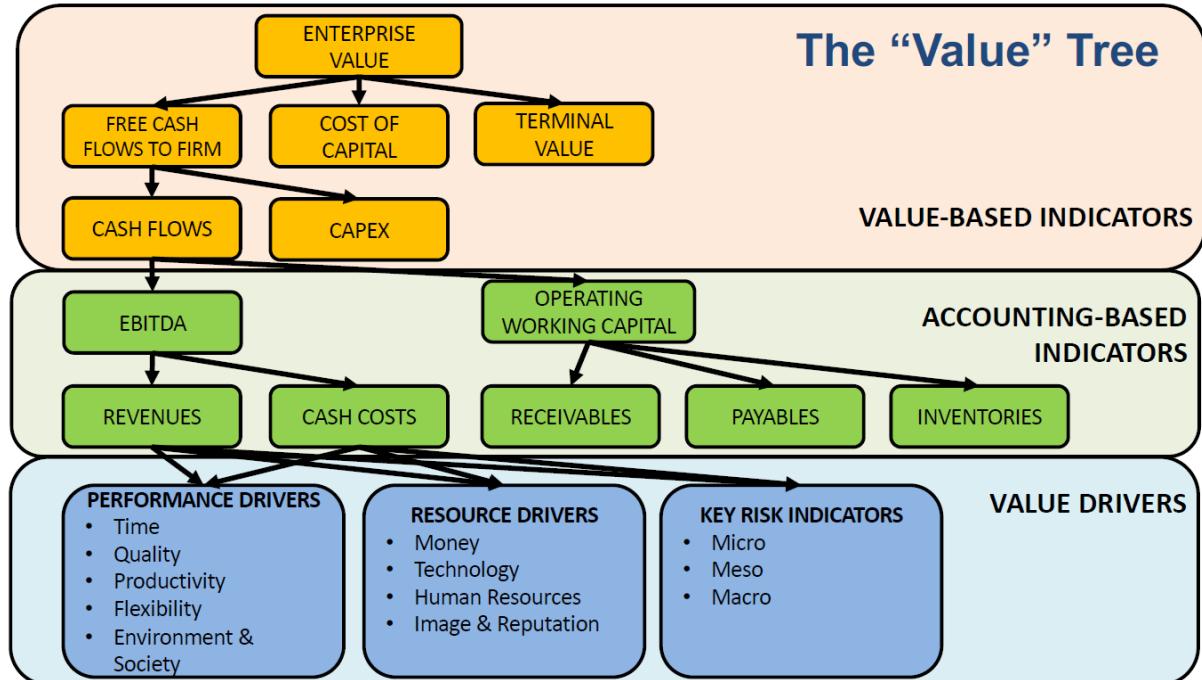
Example: The PIRELLI “Value-Tree”



Value Drivers

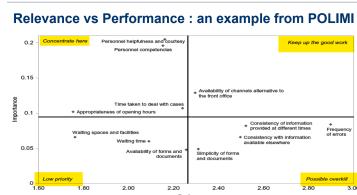
Value Drivers refer to indicators, which provide managers with earlier signals (drivers) of value creation. Drivers are endless and company-specific. However, they can be grouped in three main typologies:

- Non-financial indicators of the present performance of the enterprise
- Non-financial indicators of the resource state, that measure the potentiality of the enterprise's present resources to generate future value-added projects
- Drivers of risks, that provide early signals about what might happen and allow managers to anticipate potential risks in order to mitigate them.



Non-financial Performance Drivers

Focus <i>Competitive Factor</i>	REVENUES DRIVERS → MAX Revenues → ↑ SPU AND ≈ Sales → ≈ SPU AND ↑ Sales	COST DRIVERS → MIN COGS → ↓ full product cost per unit
Time	Time To Market (TTM) Time To Order (TTO)	Cycle Time (Throughput Time)
Quality	Claims number Customer Satisfaction	Spoilage percentage Hours for reworks
Productivity		Assets efficiency Labour productivity
Flexibility	Delayed Choices Product Range	Time of Change Skills Range
Environment & Social Responsibility	Emission level Product compliance	Energy savings



Non-financial Resource State Drivers

Indicators of Resource State aims at capturing potentialities for enterprises to innovate and grow in the medium-long term.

In spite of the different labels and clusters, four types of resources should be considered:

- **Financial** (how easy it is for a company to take different types of the debt)
- **Technological**
- **Human & Organizational**
- **Image & Reputation**

The “state” of each resource should be assessed against three types of measures:

- **Quantity**
- **Quality**
- **Accessibility**

RESOURCE	FINANCIAL	TECHNOLOGICAL	HUMAN & ORGANIZATIONAL	IMAGE & REPUTATION
QUANTITY	FINANCIAL POSITION	TOTAL PATENTS AWARDED OR PENDING	# FTE EMPLOYEES BY ROLE	# OF SOCIAL INITIATIVES
QUALITY	AVERAGE COST OF DEBT (Kd)	INCIDENCE OF NEW PRODUCT SALES	# FTE EMPLOYEES WITH PHD/MBA	BRAND EQUITY
ACCESSIBILITY	FINANCIAL LEVERAGE (D/E)	RELATIONSHIPS WITH RESEARCH CENTRES	EDUCATION LEVEL IN THE NEIGHBORHOODS	NUMBER OF FOLLOWERS

INTELLECTUAL CAPITAL

A **social initiative** can be defined as: Any purposive action aimed at addressing social problems; promoting social and environmental justice; improving the access to opportunities for deprived or marginalized persons, groups, or communities; enhancing social welfare; and contributing to sustainable development at large.

Brand equity refers to a value premium that a company generates from a product with a recognizable name when compared to a generic equivalent. Companies can create brand equity for their products by making them memorable, easily recognizable, and superior in quality and reliability. When a company has positive brand equity, customers willingly pay a high price for its products, even though they could get the same thing from a competitor for less. Customers, in effect, pay a price premium to do business with a firm they know and admire. Because the company with brand equity does not incur a higher expense than its competitors to produce the product and bring it to market, the difference in price goes to their margin. The firm's brand equity enables it to make a bigger profit on each sale.

Intellectual capital joins different types of intangible assets and it has three main dimensions:

- **Human Capital**, which refers to the skills, training, education, experience, quantity and quality of employees

- **Structural Capital** (internal), which refers to intangible assets and knowledge embedded in organizational structures and processes; this dimension comprises patents, research and development, technology
- **Relational Capital** encompasses relationships with customers and suppliers, brand names, trademarks and reputation.

Key Risk Indicators (KRIs)

Key Risk Indicators (KRI) are defined as metrics that allow managers to monitor and **anticipate the impact of one or more adverse events (risks)** that might influence negatively the capability of an enterprise to reach its goals. Typically, they refer to three typologies:

Micro-environment: drivers that refer to the **company's internal environment** (e.g., employees' satisfaction; absenteeism; machine failures etc.).

Meso-Environment: drivers that cover the company's **perimeter, such as suppliers, distributors, customers** (e.g., potential for vertical integration).

Macro-Environment: drivers that refer to the **macro-economic context and the global market** (e.g., PEST analysis).

Characteristics of Value Drivers

Timeliness: High, this is the main advantage of these measures. **Timeliness is a derived term of timeliness.** As a noun, timeliness is the state of being timely.

Long-Term Orientation: It can be high if the right indicators are selected, e.g., those aligned to competitive advantages

Measurability: it might be ambiguous; this problem is solved by implementing a protocol for each indicator where the following information is clarified:

- Measure: Title of the measure
- Purpose: Why does the company want to measure this?
- Formula: How this measure must be measured?
- Unit of analysis: which is the object of measurement?
- Frequency: How often does the company measure this?
- Sources of data: From where data can be collected?

Completeness: each indicator refers to a specific factor (no synthetic measure)

Specific Responsibilities (who is responsible for what): High, measures related to day-by-day

Note: The timeliness of accounting information refers to the provision of information to users quickly enough for them to take action.

Characteristics of all Indicators

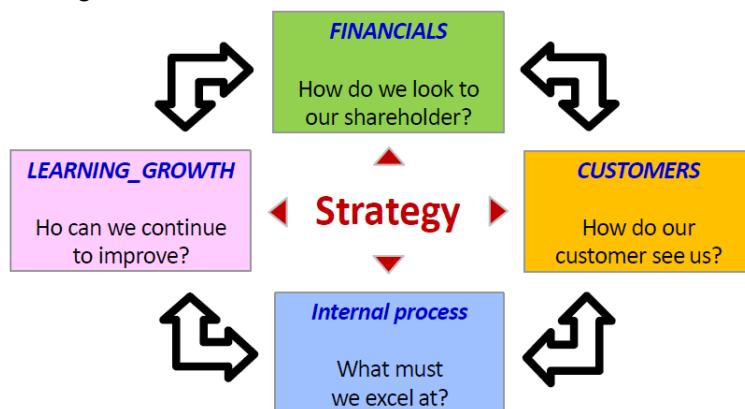
Characteristics	VALUE-BASED	ACCOUNTING-BASED	VALUE DRIVERS
Completeness	+++	++	++
Measurability	+	++	++
Long term oriented	+++	+	++
Timeliness	+	+	+++
Specific responsibilities	+	+	+++

Balanced Scorecards (1st generation)

Note: Indicators from all three groups should be considered to inform managers' decision-making. All the three types of indicators have advantages and disadvantages. It is impossible to build a good **performance measurement system (PMS)** without a mix of indicators, so several enterprises build "indicators scorecards", that are groups of different type of indicators that together can answer to all the managerial needs.

The **balanced scorecard** puts the company's strategy in the center and try to balance four perspectives, thus helping the company to grow and achieve its goals.

- Financials
- Customers
- Internal processes
- Learning & Growth



- The **FINANCIAL PERSPECTIVE** analyses the company trend towards shareholders with reference to:
 - Long-term Value (EV, E)
 - Profitability (ROE, ROI, EBIT)
 - Cash Generation (Cash Flow)
- The **CUSTOMER PERSPECTIVE** highlights performance about the relation with the market:
 - Size (market share, sales)
 - Delivery time
 - Customer satisfaction
- The **INTERNAL PROCESS PERSPECTIVE** includes measures oriented to the control of internal efficiency:
 - Average cost per unit
 - Productivity
 - Cycle Time
- The **LEARNING & GROWTH PERSPECTIVE** shows the innovative capability of the company:
 - Time to Market
 - Learning curve
 - Competencies

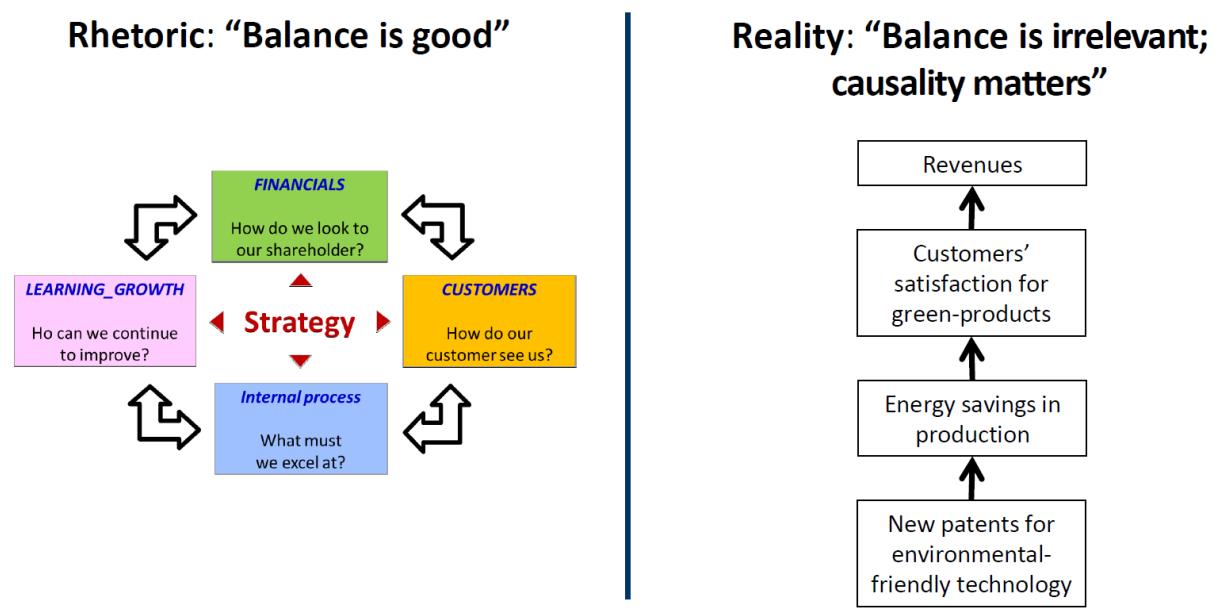
Scorecard is a useful tool in order to understand the tradeoff and connections among different indicators, and to identify how the company can translate the strategy in a plan of actions.

The basic idea of the balanced scorecard is to provide a guidance to select drivers according to the company's performance, but it does not give us indicators. Balanced scorecard is not just used by top managers (CEO, CFO ...) but also it could be made for middle-line managers. Usually, the normal number of indicators does not exceed 20 within the balanced scorecard.

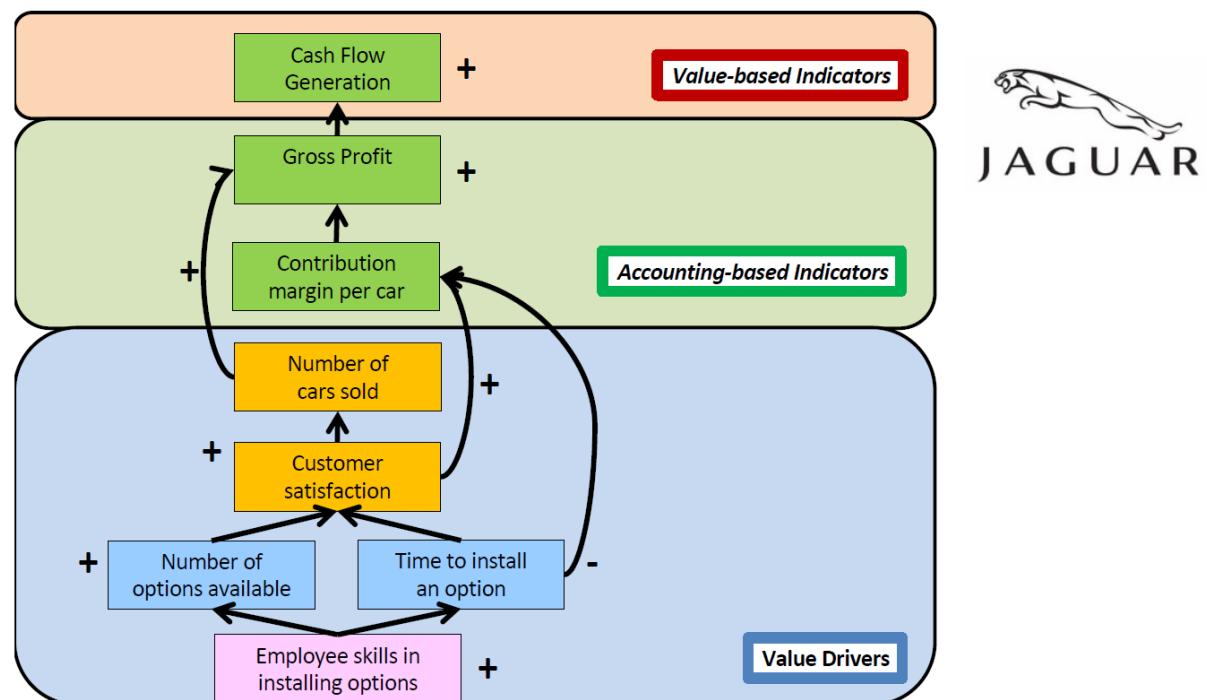
For the conceptual approach, there are two lines of thinking:

Balance is key: each area should include more or less the same number of indicators (balance between perspectives).

Causality is key: the balance is not important, because we should move from the top of the scheme and then we should ask ourselves how to increase revenues. It is based on our ability to identify connections between value drivers, so how different value drivers influence each other to create value. We have to understand how to act on the value drivers to create financial results. Starting from the financial objective, we have to move to indicators, step by step.



Focusing on causality, the second generation of the balanced scorecards called the **strategic map** was introduced. It is a simple graphic that shows a logical, cause-and-effect connection between strategic objectives. It is one of the most powerful elements in the balanced scorecard methodology, as it is used to quickly communicate how value is created by the organization.



Exercise

Value drivers are defined as earlier predictors of value generation because...

- They are interconnected in cause-effect relationships in balanced scorecards
- They monitor both current performance and resources of an enterprise
- They provide managers with timely relevant information
- They offer a more comprehensive overview of company's performance
- None of the above

The option 1 is not relevant to what the question wants. Besides value drivers, other indicators are also used in the balanced scorecards.

The option 2 is wrong because not all value drivers are considering resources.

The option 3 is the most relevant and correct answer.

The option 4 is wrong because each indicator (value driver) refers to a specific factor and therefore, they do not offer a comprehensive overview.

Social Media KPIs as early predictors

Management Reporting (Control)

The term of reporting refers to the management control cycle, which is based on cybernetics (robotics). The idea is that different parts of an organization should operate in order to achieve a share goal.

Considering the plan and control cycle in the short term, the goals are pretty much the accounting-based indicators (ROE, ROI, ROS and so on). Since the company's short-term actions should be aligned with the idea to create value in the long term, we should also consider value-based indicators like enterprise value and equity value (shared goals). In addition, the company needs some value drivers (non-financial indicators) to predict its capability to generate value in both short term and long term.

Variance analysis compares target performances with actual performances and tries to find the causes to these distances.

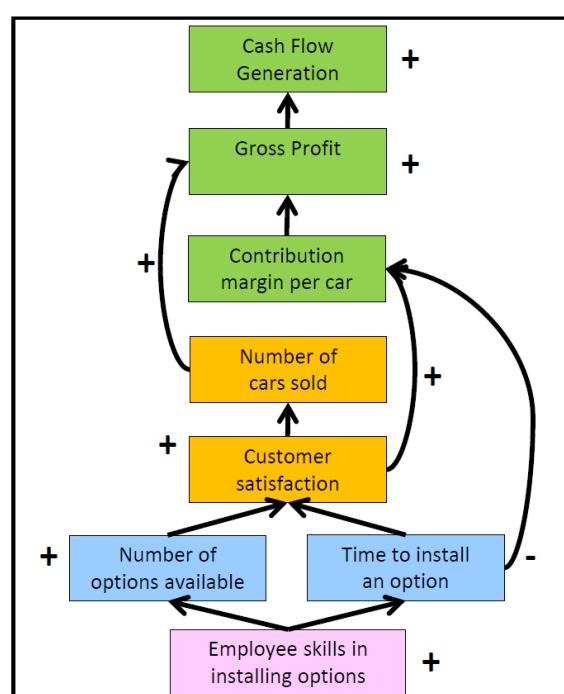
Note: In the reporting system, we provide managers with relevant information in order to support their decision-making and the implementation of corrective actions (feedback). In other words, this system clarify what should be done differently to realign the various parts of the organization in order to guarantee the capability of the company to meet the expectations of shareholders and stakeholders.

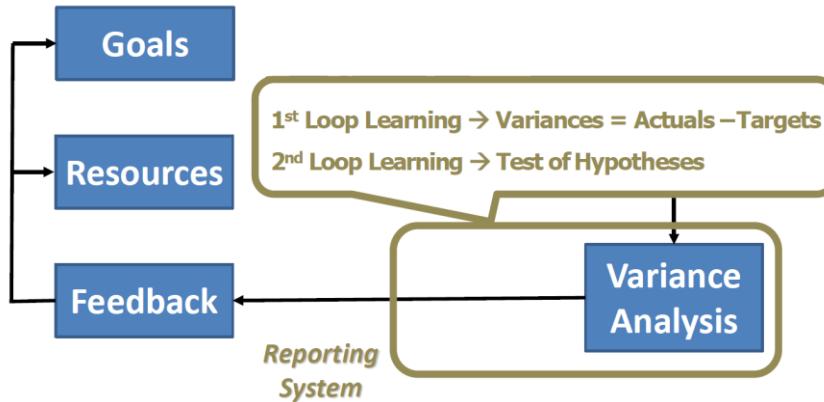


The first loop of learning of the variance analysis only determines the difference between the target and the actual performances. Here, we have no idea about what to do differently tomorrow because we cannot explain these differences.

	Target 2020	Actual 2020
Gross Profit	100,000 €	80,000 €
Customer Satisfaction	4 (out of 5)	4.2 (out of 5)
Time to install	10 h/car	8 h/car

We structure the budgeting process under the list of assumptions and hypotheses. For instance, we expect that the lower the time to install and the higher the customer satisfaction, the more the gross profit but the reality was different so our hypotheses were wrong. In the second loop of learning of the variance analysis, we try to understand the causes of differences between the targets and results in order to change our hypotheses and define new plan of actions. In this way, the company's budgeting process will improve year after year because we realize that some mechanism are different from what we expected. Therefore, the reporting system contribute to the continuous improvement of the budgeting process.





- TAKEAWAYS**
- (1) Reporting must be based on a reliable understanding of the reasons that generated the variations between actual and targets
 - (2) Incentives must reinforce favourable behaviours
 - (3) Accounting-based indicators are relevant but are not enough: try to explain that the main reason of the variations has been the poor quality of raw materials through such indicators
 - (4) Organizational Units are intertwined and the result of one Unit affect the result of the others (cybernetic view of the company)

The controllers alone cannot do the second loop of learning and therefore, they discuss and work together with managers in order to find a coherent explanation for these variations.

Management Reporting

Process of communication to a manager, who is responsible (accountable) for the allocation or the use of specified resources, the information regarding current and expected performance that are relevant for his/her decision-making (therefore, it is not a standardized report or communication).

Information that is:

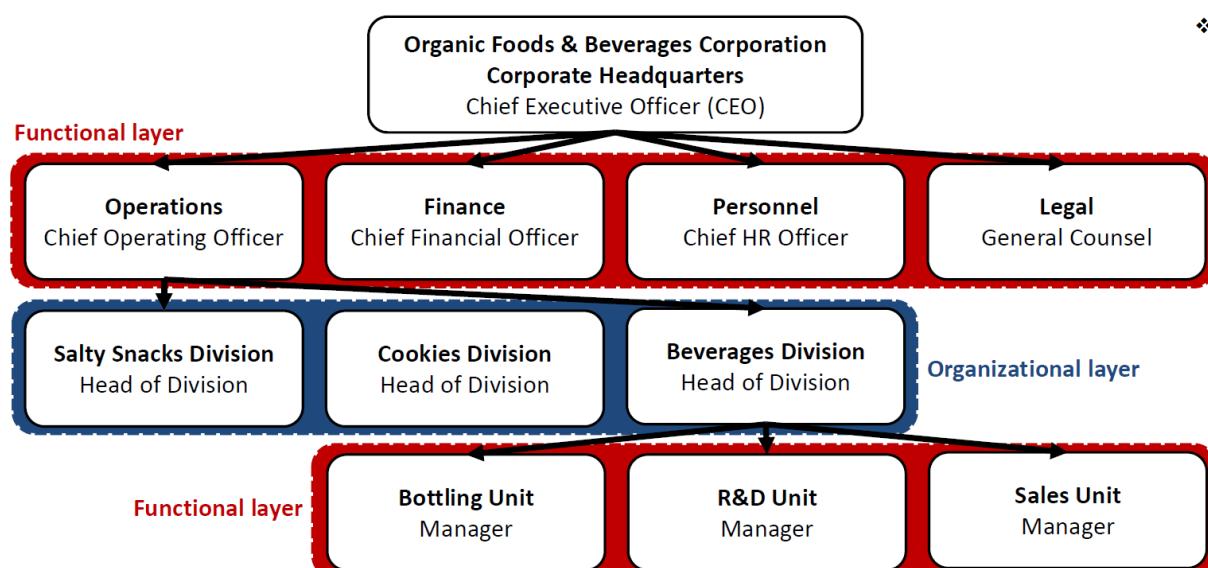
- **Relevant** (it is given by managers and they must be able to ask for information that is relevant to them)
- **Reliable** (this is the responsibility of CFO – finance unit)
- **Timely** (the information should be produced as soon as possible when it is needed)

Management reports are the most relevant source of information for managers. Structure and contents might change according to:

Addressees:

- Board of Directors (C-levels) / Chief Executive Officer
- Head of Divisions (Country Manager, Product Manager, etc.)
- Head of Functions (Sales Manager / Operations Manager, etc.)

- ❖ **Addressees:**
 - ✓ Board of Directors
 - ✓ Head of Divisions
 - ✓ Head of Functions
- ❖ **Purposes:**
 - ✓ Pure management
 - ✓ Identification of changes
- ❖ **Frequency:**
 - ✓ Daily vs. monthly



Note: we can understand that the reporting is not a standardized procedure because each manager has very different needs (customized).

Purposes:

- Pure monitoring of actual performance vs variance analysis
- Identification of the reasons of variances to support corrective actions –i.e. changes to existing plans for the months to come

Frequency:

- Daily vs. weekly vs. monthly vs. quarterly vs. annual reporting

Note: Generally, most companies use monthly or quarterly reporting. The daily reporting can be used for sales manager.

Different Responsibilities

Different organizational units have very different responsibilities. Knowing their responsibilities, we can design the management reporting for them.

Revenue Centre (sales unit): An organizational unit whose manager has control (responsible) over revenues, but not over costs or investment funds. These managers receive resources and try to maximize the revenues as a combination of sales and prices (their main goal).

Cost Centre (operations unit, logistics unit): An organizational unit whose manager has control over costs, but not over revenues or investment funds; resource consumption is related to volume of production (volume of activities is more precise). These managers receive resources and try to minimize the costs (their main goal is to be efficient).

Expense Centre (marketing, R&D, administrative, legal units): An organizational unit whose manager has control over costs, but not over revenues or investment funds; resource consumption is NOT related to volume of production. Expense center includes organizational units that are connected to the period cost and try to minimize it to become efficient. They do not have a direct connection to the volume of production and the volume of sales. Outside the academia, the expense center is called cost center.

Profit Centre: An organizational unit whose manager has control over BOTH costs (operations, logistics, R&D...) and revenues (sales), but no control over investment funds. A business unit is a profit center.

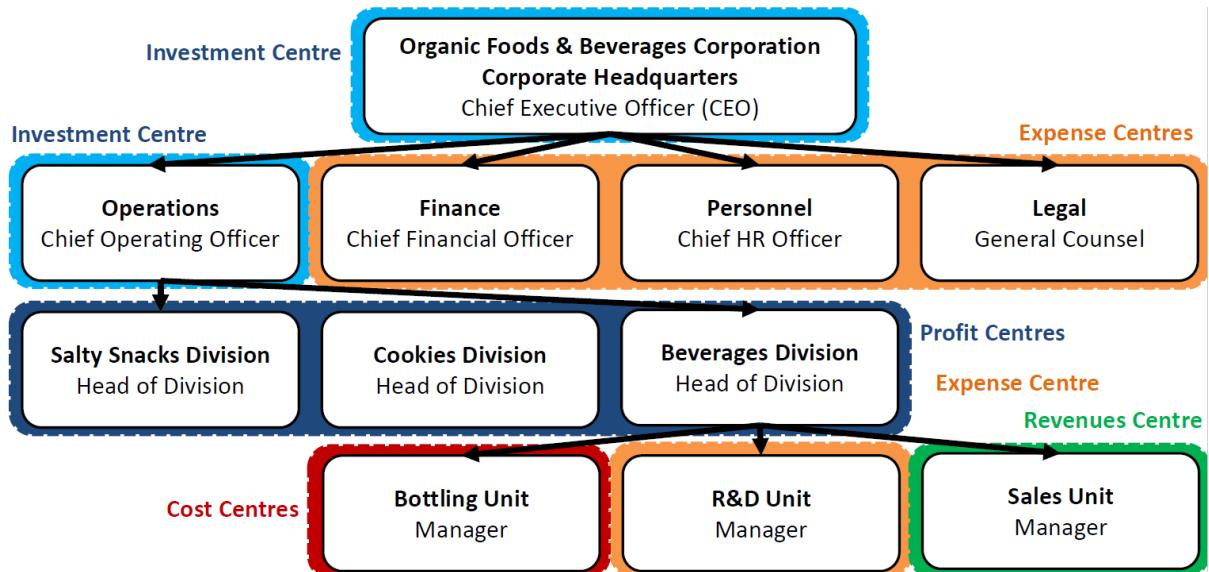
Investment Centre: An organizational unit whose manager has control over costs, revenues, and investments in operating assets (so also the leverage to fund these assets). A business unit that has also responsibility on investments is an investment center.

Note: The marketing unit is not generating revenues and therefore, it is not part of the revenue center. In the budgeting process, both the sales and marketing managers together define the revenues but the only one who is actually control the revenues is the sales manager.

Note: operations is an investment center because it is controlling three business units and therefore, it is responsible for profit. Moreover, it is deciding on the resources that should be available to these business units.

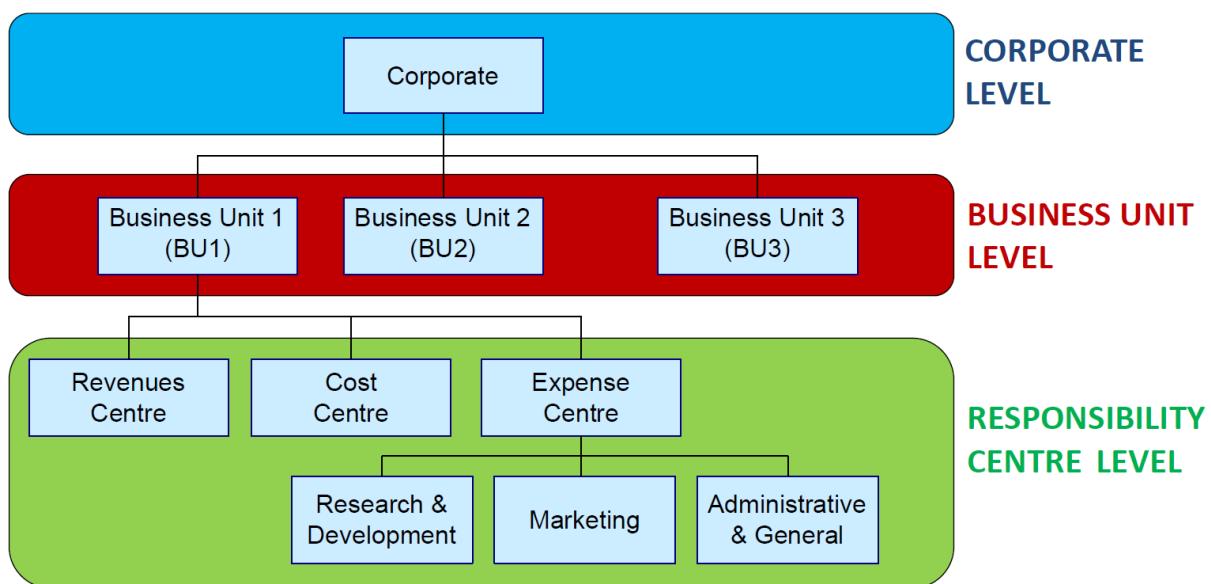
Note: In different organizations, we have different responsibilities for each unit. Therefore, the typologies of revenue, cost, and investment centers should be discussed case by case.

Note: According to your responsibilities, your management report would be different. The responsibility of each organizational unit will help us to design a management report that is relevant and useful to each of them.



Hierarchy Levels: A reference framework for us

Typical discussion about reporting is based on a divisional company because we want to distinguish between three different players: management reporting for corporate level, business unit level, and responsibility center level (Decentralization of Reporting).



Decentralization of Reporting means that we are providing all the levels with relevant information. In this way, we decentralize the sharing of information and thus the decision-makings.

PROs	CONS
<ul style="list-style-type: none"> • Top management freed to concentrate on strategy • Lower-level managers gain experience in decision-making • Decision-making authority leads to job satisfaction • Lower-level decisions are often based on better information • Improves ability to evaluate managers 	<ul style="list-style-type: none"> • May be a lack of coordination among autonomous managers (decrease the capability of the company to design coherent plan of actions) • Lower-level managers may take decisions without seeing the “big picture” • Lower-level manager’s goals may not be those of the organization (personal goals are in conflict with the organization’s goals)

Requirements for Reporting and Hierarchy

Requirements for Reporting	Corporate (higher levels)	Business Units Respons. Centres (lower levels)
Completeness	+++	+
Measurability	+	+++
Long-term oriented	+++	++
Timeliness	+	+++
Specific responsibilities	+	+++
<i>Stability across time</i>	<i>Only for external accountability</i>	

Stability across time refers to the idea that we will use the same indicators over time. However, for the internal accountability, formulas, parameters, and indicators used might be different over time because the problems might be different.

The most relevant requirements for corporate level is completeness and long-term orientation because they are setting long-term goals and strategies of the company. Timeliness is not important because they are deciding in the long term. Specific responsibilities is not important because they are responsible for all performances of the company.

The completeness is not important for the lower levels because each unit needs relevant information to itself. The measurability is crucial because these units should know the formulas and parameters used to define results and targets. These levels are more short-term oriented. Since they should solve the problems as soon as possible, the timeliness is important. Who is responsible for what should be specified.

Requirements for reporting vs types of indicators

Value-based indicators (EV, E) try to capture all the results in the long-term from the strategy set by the company. Their measurability is low because of the terminal value and all the assumptions that we must make in order to calculate them. Timeliness is very low because

projecting the financial reports takes time. Specific responsibilities is low because they merge all performances of different functions together.

Requirements for Reporting	Value-based Indicators	Accounting-based Indicators	Value-Drivers
Completeness	+++	++	++
Measurability	+	++	+++
Long-term oriented	+++	+	++
Timeliness	+	+	+++
Specific responsibilities	+	+	+++
<i>Stability across time</i>	<i>Only for external accountability</i>		

Accounting-based indicators are enough complete but they do not cover all the elements. Measurability is enough because many of them can be measured easily. With these indicators, we cannot predict performances in the long run (just the next 12 months). Timeliness is low because they are based on accounting data and it takes time to collect them. Specific responsibilities is low because they merge performances of different functions together.

Value drivers are enough complete. The measurability is very high because they are connected to the field and specific responsibility of a manager. Long-term orientation is enough because they are early signals of value creation. Timeliness is very high because we can produce them very quickly. Specific responsibilities is very high because they determine who is responsible for what.

The following table is the best combination of the characteristics of different indicators and the needs of different levels in the hierarchy. However, this combination might be different company by company.

Since the corporate level is very oriented to the long term, the value-based indicators are the backbone of the reporting system for them.

The backbone of the reporting system for business units is the accounting based indicators because middle-line managers will be evaluated based on financial reports year after year.

The backbone of the reporting system for responsibility centers is based on value drivers because they need timely information in order to guarantee the capability of the company to perform well and meet the targets. They also should know revenues to maximize it and costs/expenses to minimize because they are revenues, costs, and expenses centers.

Note: the segment margin is the difference between revenues and direct costs (both variable and fixed costs).

Note: We use RI for the business units because they can also be investment centers. Moreover, RI is based on the EBIT that is the most important parameter for this level (ROI or ROA). On the contrary, the most important parameter for corporate level is the net profit (ROE and NPM).

Hierarchy	Value-based Indicators	Accounting-based Indicators	Value-Drivers
Corporate	Backbone of the reporting system • EV or E	ROE NPM	Selected drivers for competitive advantages
Business Units	Sometimes • Cash generation	Backbone of the reporting system • ROI or ROA • RI or EVA** • Segment margin*	Selected drivers for competitive advantages
Responsibility Centres		Revenues Costs/Expenses	Backbone of the reporting system

** Economic Value Added (EVA) = NOPAT – WACC * Invested Capital

* See next slides

Reporting at the Corporate Level

What Content for CEO / C-levels?

A. The **external (exogenous) landscape**

(Macro-economic indicators – GDP values and trends in the main market countries (also target market countries), inflation rates, interest rates, currency exchange rates, and other important facts occurred in the period)

B. The **Income Statements**

- For a Group: Income Statement of the consolidated companies (the Holding, the Subsidiaries)
- For each company: the total Income Statement, the Income Statement of each Strategic Business Unit / Division

C. The **Cash Flow Statements**

- Focus on Cash Flow from Operating Activities
- Relationship of Cash Flow from Operating Activities with the Cash Flows from Investing and Financing Activities

The latter informs top managers about the capability to fund the next investments and the need to open new debt positions with banks, bondholders or other financial instruments in order to sustain the investment plans of the company.

D. Information about the state of progress of the investment plan (use of capital budget)

E. Other (complementary) information about:

- State of progress/results of specific (strategic) projects
- Drill-downs on specific geographical markets
- Other (often non-financial) information (market shares, time-to-market, customer satisfaction, carbon footprint, sentiment analysis on social media, etc.)

Note: The income statement by destination allows understanding the contribution of the different functions or different parts of the organization.

Note: the idea of reporting is to provide information about the past in order to support decision-making about the next future (feedback or corrective actions). In other words, we are learning from the past in order to guarantee that the company will meet the targets.

An example of periodic Management Reporting

Assumptions:

- Quarterly reporting
- Income Statement «by destination»

ACTUAL YTD 2020 + BUDGETED
3RD AND 4TH QTRS

	ACTUAL 2ND QTR 2020	BUDG 2ND QTR 2020	Variance	Var. %	ACTUAL YTD 2020	BUDG YTD 2020	Variance	Var. %	FORECAST 2020	TOTAL BDG 2020	Variance	Var. %
Revenues	1.080,00	1.000,00	80,00	8,00%	2.150,00	2.100,00	50,00	2,38%	4.230,00	4.160,00	70,00	1,68%
- Cost Of Goods Sold (COGS)	750,00	700,00	50,00	7,14%	1.470,00	1.450,00	20,00	1,38%	2.870,00	2.800,00	70,00	2,50%
Gross Margin	330,00	300,00	30,00	10,00%	680,00	650,00	30,00	4,62%	1.360,00	1.360,00	0,00	0,00%
- Non manufacturing ("SMAG") expenses	215,00	200,00	15,00	7,50%	435,00	400,00	35,00	8,75%	850,00	830,00	20,00	2,41%
EBIT	115,00	100,00	15,00	15,00%	245,00	250,00	-5,00	-2,00%	510,00	530,00	-20,00	-3,77%
- Bank interests	15,00	12,00	3,00	25,00%	30,00	24,00	6,00	25,00%	54,00	48,00	6,00	12,50%
EBT	100,00	88,00	12,00	13,64%	215,00	226,00	-11,00	-4,87%	456,00	482,00	-26,00	-5,39%
- Taxes	40,00	35,20	4,80	13,64%	86,00	90,40	-4,40	-4,87%	182,40	192,80	-10,40	-5,39%
NET PROFIT	60,00	52,80	7,20	13,64%	129,00	135,60	-6,60	-4,87%	273,60	289,20	-15,60	-5,39%
NPM	5,56%	5,28%	0,28%	5,22%	6,00%	6,46%	-0,46%	-7,08%	6,47%	6,95%	-0,48%	-6,96%

Three main sections:

1. actual vs. budgeted data for the 2nd quarter
2. actual vs. budgeted data «year-to-date» (cumulated first + second quarters)
3. forecast 2020 (i.e. actual data YTD + revised budgets for the 3rd and 4th quarters) vs budget 2020

Periodic Management Reporting

The typical sections that are presented in the management reporting:

The starting point is the profitability analysis with a focus on the Income Statement

- The traditional framework includes actual vs budgeted data, where variances (deviations) are also reported (absolute and %values)
- Note:** it is important to explain the variations between actual numbers and budgeted data.
- Usually the statement includes at least two sections:
 - Actual vs budget values concerning the last timeframe (in case of monthly reporting: last month).
 - Cumulated actual vs. budget values for the Year-To-Date (YTD)
 - In some cases a further section is added, which includes the expected results for the whole year (usually called “forecast” or “pre-closing”) vs. the total budget values (as from initial budget) and/or vs. previous forecast (if any)
 - Sometimes actual and budgeted data are compared also with the corresponding actual data of previous year (to enable a “Year-To-Year” comparison) in order to show the progress of the company over time.

Note: In some cases, the cash flow statement is also requested by top managers for periodic management reporting.

Note: data visualization is part of the reporting.

Reporting at the Business unit Level

Business units are profit centers or investment centers whose managers are responsible of generating a positive EBIT against the resources available to them (ROI or ROA). In addition, they are responsible to provide the company with the capability to remunerate the banks, bondholders, and shareholders (RI or EVA).

The segment margin is the most important indicator at the business unit level. If we accept that the backbone of the reporting system at the business level is based on accounting-based indicators, we must be able to calculate the EBIT of each business unit. Therefore, the focus is to provide the calculations of income statement until the EBIT for each business unit in order to apply the accounting-based indicators.

Although the accounting-based indicators are the most relevant (but very slow) for business unit level, we have to complement them with some fast indicators (value drivers) to take actions against problems.

Note: When the business unit is an investment center, it is important for them to have an idea about the cash generation because cash flow from operating activities shows the capability of the company to cover the instalments of current investments or make new investments.

Note: The third type of the income statement that is used for internal accountability is the income statement by contribution margin. This third scheme is useful for supporting short-term decision-making. In a contribution margin income statement, a company's variable expenses (both product and period costs) are deducted from sales to arrive at a contribution margin. Contribution margin shows how much of a company's revenues are contributing to its fixed costs and net income.

The Income Statement by Contribution Margin organizes costs in variable vs fixed.

Contribution margin per unit $m = SPU$ (selling price per unit) – VCU (variable cost per unit)

Contribution Margin (total) $M = Revenues - Variable Costs$

An example to clarify

Vulcan Company – Income Statement June 30th:

Management is disappointed with the company's performance and is wondering what can be done to improve profits. The EBIT most likely is not enough to cover financial costs and taxes. In addition, ROS is less than 5%.

Sales (Revenues)	\$750,000.00
Less variable expenses	\$336,000.00
Contribution Margin	\$414,000.00
Less fixed expenses	\$378,000.00
Net Operating Income	\$36,000.00

The company is divided into two sales territories: Northern and Southern (two business units). The Northern territory recorded \$300,000 in sales and \$156,000 in variable expenses during June; the remaining sales and variable expenses were recorded in the Southern territory.

Fixed expenses of \$120,000 and \$108,000 are traceable (direct cost) to the Northern and Southern territories, respectively.

A **traceable cost** is a cost for which there is a direct, cause-and-effect relationship with a process, product, customer, geographical area, or other cost object. A common cost is a cost that is not attributable to a specific cost object, such as a product or process.

The rest of the fixed expenses are common (not traceable) to the two territories.

Note: The variable costs are direct costs.

Segment Margin = Revenues - Direct Costs (both variable and fixed)

We evaluate the middle-line managers (BU managers) against the segment margin because they have control on variable costs and direct fixed costs (directly associated to the BU). Therefore, segment margin is a consequence of the specific responsibilities principle.

The segment margin can refer to different segments like BU or product line, or so on.

Segmentation by sales territory (percentage):

	Total Company	Sales Territory	
		Northern	Southern
Sales	\$750,000	\$300,000	\$450,000
Variable expenses.....	<u>336,000</u>	156,000	<u>180,000</u>
Contribution margin	414,000	144,000	270,000
Traceable fixed expenses.....	<u>228,000</u>	<u>120,000</u>	<u>108,000</u>
Sales territory segment margin	186,000	<u>\$ 24,000</u>	<u>\$162,000</u>
Common fixed expenses not traceable to sales territories (\$378,000 – \$228,000 = \$150,000).....	<u>150,000</u>	Corporate Costs that are not allocated to the segments	
Net operating income.....	<u>\$ 36,000</u>		

Traceable vs Not Traceable Corporate Costs

Corporate Costs are associated to resources managed at the corporate level to generate advantages for business units. Examples of Corporate Costs: R&D activities, legal activities, brand marketing campaigns, IT security etc.

- **DIRECT** corporate costs (i.e., Traceable) are those corporate costs that can be specifically and exclusively identified with a particular Business Unit:

If the **R&D department** carried out applied research **on behalf of Business Unit (A)**, the incurred costs are direct to BU (A)

- **INDIRECT** corporate costs (i.e., Not Traceable) are those costs that cannot be identified specifically and exclusively with a particular Business Unit:

If the **R&D department carried out basic research** **on behalf of the whole company**, the incurred costs are indirect to the BUs

Here, we face a dilemma, should we stop at the segment margin to maximize the specific responsibilities principle or should we try to allocate the costs that are not traced to increase the comprehensiveness of the analysis (but reduce the specific responsibilities). In the latter case, we can calculate ROA, ROI, RI... because we can obtain the EBIT of each business unit.

Segmentation by sales territory (percentage):

- Compared to the Southern territory, the Northern territory has a lower contribution margin ratio.
- The Northern territory has high traceable fixed expenses.
- Overall, compared to the Southern territory, the Northern territory is very weak.

	Total Company	Sales Territory	
		Northern	Southern
Sales.....	100.0%	100%	100%
Variable expenses.....	44.8%	52%	40%
Contribution margin.....	55.2%	48%	60%
Traceable fixed expenses.....	30.4%	40%	24%
Sales territory segment margin	24.8%	<u>8%</u>	<u>36%</u>
Common fixed expenses not traceable to sales territories (\$378,000 – \$228,000 = \$150,000).....		20.0%	
Net operating income.....		<u>4.8%</u>	

Segmentation by Product Lines

The company is the exclusive distributor for two products: Paks and Tibs. Sales of Paks and Tibs totaled \$50,000 and \$250,000, respectively, in the Northern territory during June.

Variable expenses are 22% of the selling price for Paks and 58% for Tibs. Cost records show that \$30,000 of the Northern territory's fixed expense are traceable to Paks and \$40,000 to Tibs, with the remainder common to the two products.

Common fixed costs in the below table are direct (traced) to the segments and indirect to the product lines.

Segmentation by product lines (Northern Territory)

	Northern Territory	Product Line	
		Paks	Tibs
Sales	\$300,000	\$50,000	\$250,000
Variable expenses.....	<u>156,000</u>	<u>11,000</u>	<u>145,000</u>
Contribution margin	144,000	39,000	105,000
Traceable fixed expenses.....	70,000	30,000	40,000
Product line segment margin	74,000	<u>\$ 9,000</u>	<u>\$ 65,000</u>
Common fixed expenses not traceable to product lines (\$120,000 – \$70,000 = \$50,000)....		50,000	
Sales territory segment margin		<u>\$ 24,000</u>	

Segmentation by product lines (%) (Northern Territory)

	Northern Territory	Product Line	
		Paks	Tibs
Sales	100.0%	100%	100%
Variable expenses.....	52.0%	22%	58%
Contribution margin	48.0%	78%	42%
Traceable fixed expenses.....	23.3%	60%	16%
Product line segment margin	24.7%	<u>18%</u>	<u>26%</u>
Common fixed expenses not traceable to product lines (\$120,000 – \$70,000 = \$50,000)....		16.7%	
Sales territory segment margin		<u>8.0%</u>	

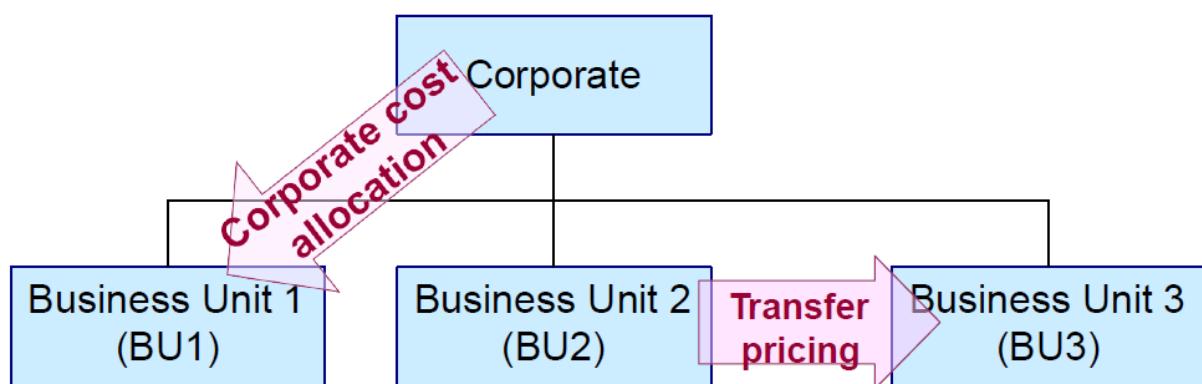
The Northern territory has a poor sales mix. The territory sells very little of the Paks product, which has a high contribution margin ratio. On the contrary, the traceable fixed expenses of the Paks seem very high in relation to sales (niche product: high price and contribution margin and low variable cost). The volume is small and therefore, fixed cost cannot be covered. Therefore, an increase in sales of this product line would enhance profits in the Northern territory and in the company.

Tibs seem to be a mass production product and therefore, the contribution margin is lower; however, the volume is very high and it can sustain the fixed cost.

Note: if it is written in the exam that R&D is a part of a specific BU, the R&D costs are direct for that unit because R&D is under control of that unit.

From the Corporate to the Business Units

Reporting at the Business Unit level relies mainly on accounting-based indicators to be applied to the Income Statement till the EBIT. To generate it, two relevant issues arise:



- Resources used by BUs but managed at the corporate level (corporate cost allocation problem)
- Existing transactions with other BUs within the company (intra-company exchanges like selling and buying products) (transfer pricing problem)

At the corporate level, transactions among BUs are not relevant because it is a consolidation problem and costs and revenues neutralize each other. However, at the business unit level, we should price these transactions because we want to analyze the performances of managers and make the income statement till EBIT to apply accounting-based indicators.

Corporate Costs Allocation

Corporate Costs are associated to resources managed at the corporate level to generate advantages for business units. Examples of Corporate Costs: R&D activities, legal activities, brand marketing campaigns, IT security, maintenance services etc. (but when they are concentrated at the corporate level and not inside a single business unit).

There are three main strategies:

	PROs	CONs
No allocation	No costs for running the system because you do not need to find allocation basis, collect information and so on.	Risk of uncontrolled use of resources because managers do not know the costs that the company is incurring to run these functions. For example, they receive maintenance services without paying and therefore, they may use this service more frequently without necessity.
Complete allocation	Managers know that corporate services are not for free and they are also responsible for corporate costs.	Need of precision <u>Risk of not using services even if they are needed</u>
Partial Allocation (between the segment margin and the EBIT)	<u>It respects the specific responsibilities principle</u> Clear decision-making	<u>It cannot be applied to all types of corporate costs</u>

In the case of complete allocation, the sum of EBITs of different business units are equal to the EBIT of the company.

From a theoretical perspective, corporate costs should be allocated to Business Units according to:

- Number, intensity, or complexity of services delivered
- Benefits generated from services

When this is not straightforward, “default” drivers are used:

- Revenues because it is the proxy of the size and dimension of a business unit. The bigger the BU, the higher services it will need.
- Full time equivalent (FTE) employees is another proxy of the size and dimension of a business unit.
- Proportional to contribution margin. This option is not good because it is against the attitude to improve (more a BU try to make higher revenues, it should pay more)

Example: costs of the corporate Finance Office

- Capacity for internal consulting = 200 h
- Overall costs = 50,000 €

Two Business Units:

- BU (A) = use of 100 h of the corporate Finance Office
- BU (B) = use of 60 h of the corporate finance office

Total usage = 160h

How to allocate?

Consumption (complete allocation)

Cost per hour = 50,000€ / 160h = 312.5€/h

Costs to BU (A) = 312.5€/h * 100h = 31,250€

Costs to BU (B) = 312.5€/h * 60h = 18,750€

Note: In this way, when a BU is asking for this consultancy, it has not any idea of the cost per hour. Therefore, it causes the risk of not using services even if they are needed.

Fees (partial allocation)

Cost per hour = 50,000€ / 200h = 250€/h

Costs to BU (A) = 250€/h * 100h = 25,000€

Costs to BU (B) = 250€/h * 60h = 15,000€

Costs NOT allocated = 10,000€ \Rightarrow corporate costs not allocated (partial)

In this way, the cost for not used capacity will remain a corporate cost because there is a misalignment between the capacity available and the capacity needed. The corporate level is responsible and accountable for this difference (their choice).

Exercise 1

Which of the following statements about Corporate Costs is correct?

- a) Corporate Costs can be distinguished into three main groups: direct costs, indirect costs, and period costs.
- b) Corporate Costs can be allocated to Business Units using the following approaches: a market-based approach or a cost-based approach; the cost-based approach can rely on either actual or standard costs.
- c) A partial corporate cost allocation based on proportional allocation drivers allows to fairly allocate costs related to spare capacity among the Business Units.
- d) A partial corporate cost allocation based on fees should be preferred in the case of costs related to spare capacity.

Exercise 2

Which sets of indicators is more appropriate to manage the performance of an intra-company manufacturing business unit?

- EVA, NOPAT, n. of claims, time-to-market
- EBIT margin, FCFF, n. of claims, time-to-market
- FCFE, time-to-market n. of claims, scrap rate
- Time-to-market, delivery time, n. of claims, scrap rate

In the first option, the NOPAT is wrong because corporate tax rate is not under the responsibility of business unit manager.

In the second option, the NOPAT is included in the calculation of FCFF.

In the third option, the NOPAT, share capital, and financial activities are included in the calculation of FCFE.

Exercise 3

Which of the following statements about reporting at the Business Unit (BU) level is FALSE:

- a. To isolate the performance of BUs within the company, two specific problems must be addressed: the existence of intercompany exchanges and the presence of resources used by the BUs that are managed at the corporate level
- b. To meet the “specific responsibility” requirement for reporting at the BU level, companies must allocate all corporate costs to the BUs
- c. The existence of intercompany exchanges has fiscal implications when the BUs, belonging to the same group, are autonomous juridical entities located in different countries.
- d. When using non-financial indicators at the BU level, it is convenient to identify indicators that isolate specific responsibilities of each BU

Last file on Responsibility center

Performance Management - Transfer pricing

Transfer Pricing: Existing transactions between BUs. There could be a BU selling one product or service to another one (which belongs to the same corporation). In other words, transfer pricing is a transaction that occurs between two BUs of the same company.

Transfer price is a “fictitious” price for evaluating intracompany exchanges: it is the price one division charges for a product or service supplied to another unit.

The transfer price is:

- A cost to the receiving division
- A revenue to the supplying division

Once defined, transfer prices affect:

- Divisions performances
- Divisions decisions
- Company result

Transfer prices' goals

Transfer prices are a relevant problem: nearly 60% of world trading activity is intra-company

A transfer pricing system is required for several purposes:

- To provide information that motivates divisional managers to make good economic decisions: Having an idea on how the internal transactions are regulated helps the manager to decide if it is more convenient to do internal or external transactions.
- To communicate data that will lead to goal-congruent decisions ensuring coherence between divisions;
- To provide information for evaluating divisional performances;
- To ensure divisional autonomy: Divisions can autonomously decide about the transaction they want to make.
- To plan tax, intentionally moving profits between divisions or locations: a company can use transfer pricing to move profit from countries with higher tax rate to countries with lower tax rate. [reduce tax rate in Switzerland for providing workplace also Ireland](#)

Transfer prices and taxes

In multinational companies, different BUs may be spread in different countries and have transactions among each other. Each country has its own fiscal regulations or law in terms of tax payments. Companies can decide to allocate the BU where there are more favorable conditions for the transactions, so that it then moves profit from the BU with high tax rate to the BU with low tax rate.

The divisional exchanges for multinational companies can be used for transferring profit from one country to another taking advantage of different tax rates (income taxes, duties...)

In 1995, OECD (Organization for Economic Co-operation and Development) published a guidance reflecting an international consensus reached by OECD member countries.

OECD and transfer pricing - arm's length principle:

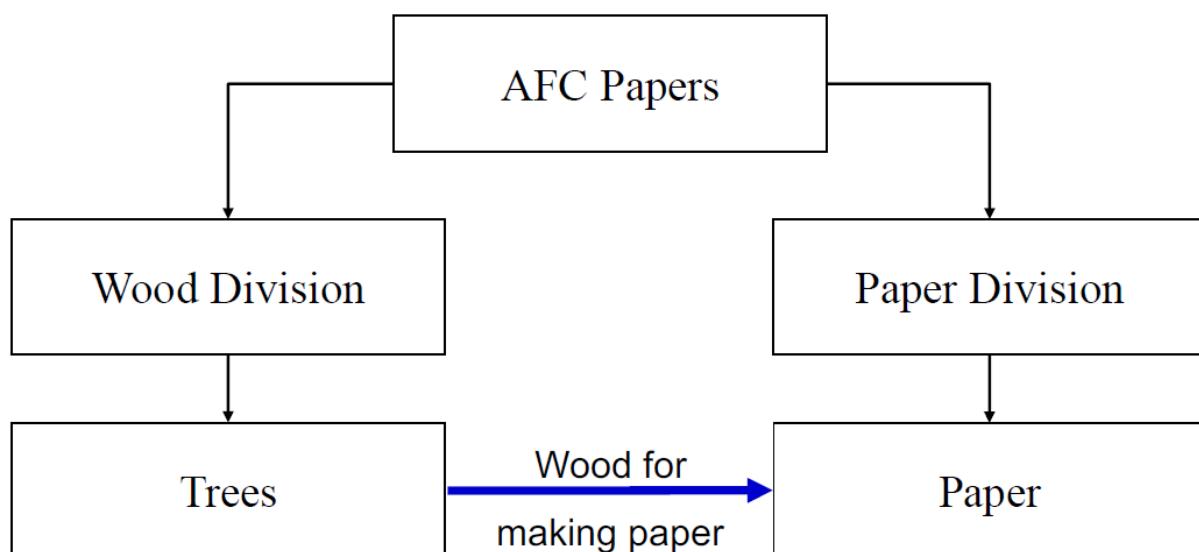
Each associated enterprise of a multinational enterprise is considered as a separate entity. "Arm's length principle" should be used to determine transfer prices for tax purposes. This principle states that the transfer prices for dealings between associated enterprises should be those which would have been agreed between them, for comparable transactions in comparable circumstances, had they been independent entities acting at arm's length.

When an internal transaction arises, the BUs should act as a separate entity: They should be fair in the exchange and use the arm's length principle, for which the price applied to the product should be the same price applied on the external market in comparable transactions, as if the two BUs were independent. The BUs belong to the same corporation, but they should act as separate entity.

What happens if they act as separate entities? They are pricing the product with a fair value, that is, the market value.

Example: I need a house and my parents have a house, they decide to sell the house to me and since I am their son, they apply to the house a price that is favorable. This is not the arm's length principle, since they should apply the same price in the market. The same works for business units.

Case Study on Transfer Prices



AFC Papers Cost and Production Data

	Wood	Paper
Average units produced	100,000	
Average units sold		100,000
Variable manufacturing cost per unit	\$ 20	
Variable finishing cost per unit		\$ 30
Fixed divisional cost (unavoidable)	\$ 2,000,000	\$ 4,000,000

- ³ Market-based transfer prices
- ² Cost-based plus mark up transfer prices:
 - Full actual cost
 - Full standard cost
 - Marginal cost
- ⁴ Negotiated transfer prices
- ¹ Dual transfer prices

Transfer Pricing Methods

1. Market-based transfer prices

Prices applied to internal transactions are the same that would be applied to the same product and service when it is sold / bought on the external market. We value an internal transaction between two BUs on the basis of the market price applied to a similar transaction between two independent entities (like company A and B).

Which prices should we use?

- Listed prices of identical/similar products/services
- Actual price of intermediate products if sold to external customers
- Price offered by competitors

Problems:

Non-homogeneous markets: When the market has different products and services from the one we need to transfer (in quality, price, and technological features), it is difficult to find the right benchmark transaction to refer to. For example, with high customized products we do not use the market based TP, but the cost based TP.

High variability of prices: The price goes up and down over time. In this case, a market-based transfer price does not work properly because opportunistic behavior of the individuals arises.

Strategic divisions: A BU carries out specific phases of the process and creates the competitive advantage of the company's product. For a strategic division, it is difficult to apply the market-based transfer prices because in many cases the product would not be the same. The solution is dual transfer prices, which is explained later.

2. Cost-based plus markup transfer prices:

This type of transfer price is based on the cost sustained by the seller to produce or deliver the product of the internal transaction, to which it is added a markup, in order to recognize an operational margin.

$$\text{Transfer Price} = \text{cost} + \text{mark up}$$

There are different configurations:

- Full actual cost transfer prices:

Sum of the cost of all resources that are used in producing a good or delivering a service.

Problem: Specific responsibilities of BUs (the receiving BU absorbs the inefficiencies of selling BU)

- Full standard cost transfer prices:

Budgeted costs of all resources that are going to be used in the long term.

Problem: Decision-making

- Marginal cost transfer prices

Sum of variable costs (variable direct costs + variable indirect costs). We use this method when the fixed costs are quite low.

Problem: in case of high fixed cost, we cannot sustain it.

3. Negotiated transfer prices

Negotiated transfer prices: the divisions of a company are free to negotiate the transfer price between themselves and then to decide whether to buy and sell internally or deal with outside parties. Information related to market prices or marginal and full costs can inform the negotiation process.

Pros:

- Increased autonomy;
- Emphasis on adapting capability of business units;

Cons:

- Decreased integration.

4. Dual Transfer Prices

Under a dual transfer pricing scheme, the selling price received by the upstream division differs from the purchase price paid by the downstream division.

Usually, the motivation for using dual transfer pricing is to allow the selling price to exceed the purchase price, resulting in a corporate-level subsidy that encourages the divisions to participate in the transfer.

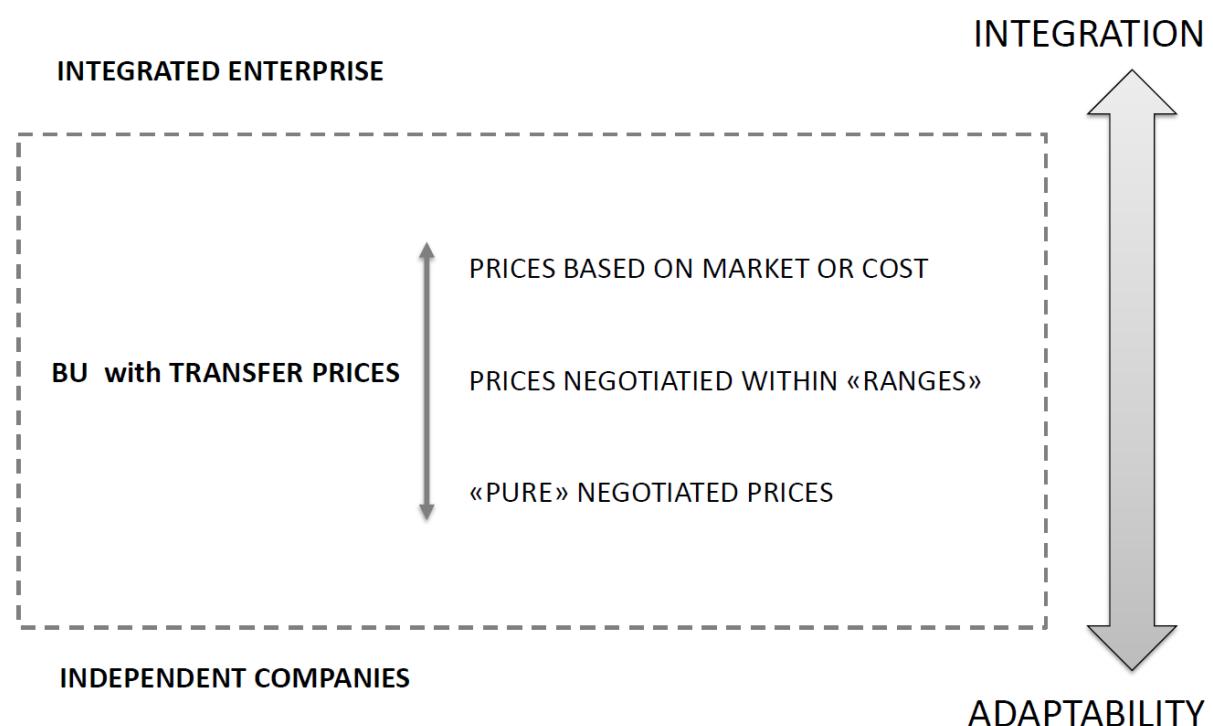
For example:

- For the selling division the TP = 110% of its full manufacturing cost
- The buying division pays 95% of the external market price

Pros: Increased integration

Cons: Possible sub-optimized decisions

Which method?



Exercise 1

Group AERO is composed by the parent and three subsidiaries: A, B and C. A is the upstream company of AERO that supplies and sells internally components to both B and C. AERO adopts a transfer pricing policy based on FULL ACTUAL COST plus a mark-up of 10% on the full actual cost (for example if the unit full actual cost of a product is 10€/unit, the transfer price is 11€/unit). The transfer price is calculated and then charged internally every month.

The calculation of the unit actual cost is composed of three items: (1) direct materials; (2) direct labor; and (3) manufacturing overhead (OVH). In January 2021, Subsidiary A has already produced 800 products using 1,500 machine-hours. At the end of January 2021, on the same day, subsidiary A receives two additional orders ("4" and "5"), whose requirements are reported below:

	Additional units	Direct material (€/unit)	Direct Labour (€/unit)	Manufacturing overhead (€/unit)	N. of machine-hours needed per unit
Additional order 4 from B	150	15	13	11.25	1.5
Additional order 5 from C	350	15	13	7.50	1

While raw materials are available and workers are paid on an hourly basis without capacity constraints, there is a constraint on the machine capacity. The maximum total machine capacity is 2,000 hours per month.

Considering the transfer pricing policy adopted, which of the following sentence is correct?

- a) For the Business Unit A, it is indifferent producing for B or C.
- b) The best option for A is to produce 100 unit for B (order 4) and 350 unit for C (order 5)
- c) Total revenues for the additional two orders for A are 20.143,75 €.
- d) The best option for A is to produce 150 unit for B (order 4) and 275 unit for C (order 5)

$$\text{Remaining machine capacity} = 2000 - 1500 = 500$$

$$\text{Capacity needed (order 4)} = 150 * 1.5 = 225$$

$$\text{Capacity needed (order 5)} = 350 * 1 = 350$$

$$\text{Transfer price for B} = (15 + 13 + 11.25) * 1.1 = 43.175$$

$$\text{Transfer price for C} = (15 + 13 + 7.5) * 1.1 = 39.05$$

Exercise 2

Which of the following statements about transfer prices among business units that are part of the same legal entity is TRUE?

- a. Among the different options, DUAL transfer prices should be preferred
- b. In the case of FULL ACTUAL cost plus mark-up, inefficiencies of the upstream unit (the seller) do not affect the downstream unit (the buyer), because they are absorbed as a corporate cost
- c. Among the different options, FULL STANDARD cost-based plus mark-up transfer prices should be preferred even if they need to be redefined very frequently
- d. In case of an internal transaction among business units, there is no impact on the taxes incurred by the corporation

Exercise 3

The introduction of a transfer pricing systems based on full standard cost plus mark up:

- a. Can have an effect of the taxes paid by the selling unit, when the selling and the buying units are two different legal entities.
- b. Has always a fiscal effect on both the selling and the buying units.
- c. Can have a fiscal effect on the buying unit, even if the selling and the buying units are not two different legal entities.
- d. Does not have a fiscal effect.

When we are talking about one legal entity, there will be no difference in the taxation (it is different when we have different legal entities).

