POLITECNICO
MILANO 1863

Accounting, Finance & Control

Accounting-based Indicators

Prof. Emanuele LETTIERI, PhD
emanuele.lettieri@polimi.it

Analysis of Financial Statements (1)

- The aim of the analysis of an Annual Report is to provide **a quick and useful overview** of the **company's main results (performance)** point of view = Financial / these reports are built up on financial reports

  Can't measure the creativity or ... (proxies like cost of labour, ...)

- The overview summarizes **relevant information** about:
  - ❖ the **economic profit** achieved **and its components** (**profitability analysis**) Revenue higher than cost, generate positive net income Income Statement
  - ❖ the **status of liquidity and its "coherence"** to present **obligations** (**liquidity analysis**) Risk of bankrupsy Cash balance, Cash inflow > Cash outflow Cashflow statement

Why And How => Predict the future, Strategy Next 12 Month

"Revenue is vanity, profit is sanity and cash is reality"

Charles J. Murphy

Analysis of Financial Statements (2)

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.

Financial analysts usually**:**

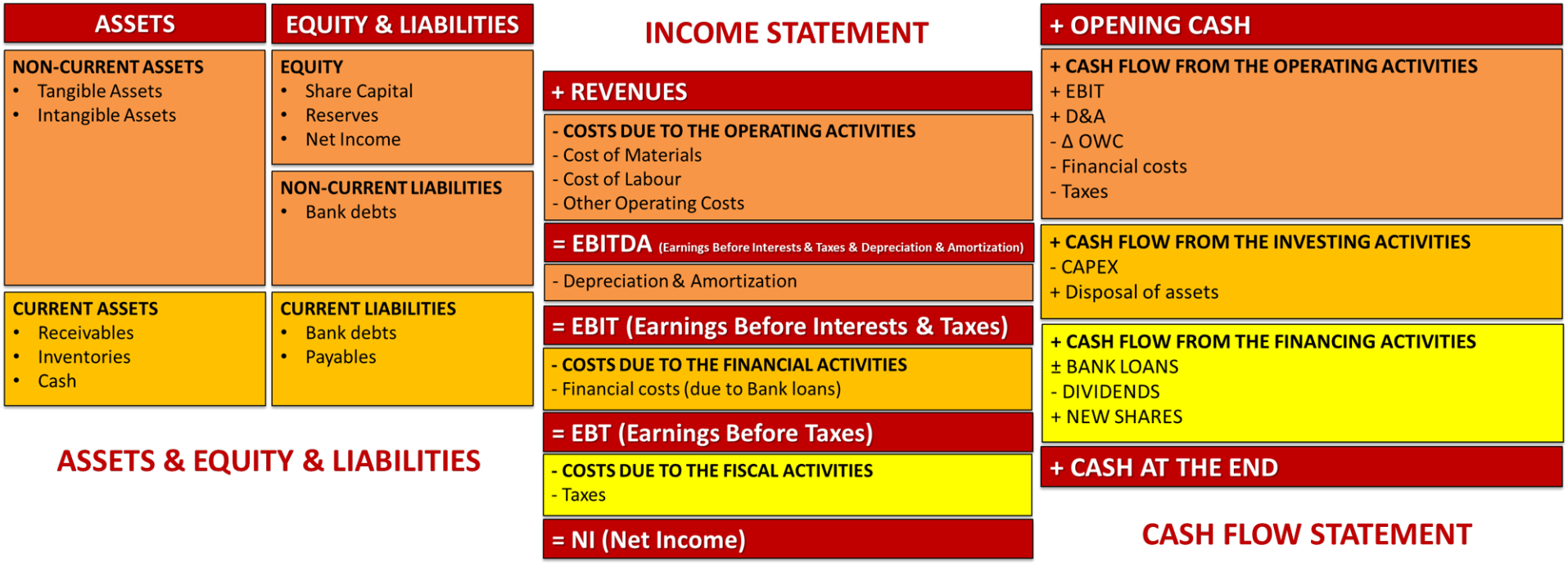
- **compare** present with **past company's performance** (3-4 years) and define an historical trend, **further investigating** potential **impacts of contingencies** or **non-ordinary events** related to the **company's own activities**

- **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**

- Size
- portfolio (business activity)
- geographical distribution

Accounting-based Indicators

Indicators that are calculated
on the three Financial Statement



Profitability Analysis: 3 Perspectives

- 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, assuming net profit (E) (i.e. the "reward" of shareholders) as the main item of analysis

Dividends

Overall company's perspective, assuming operating profit (i.e. EBIT) as the main item of analysis

Middle line manager => Owner of the operation
Max of EBIT(operating Profit)

Stakeholders' perspective, analysing the effects of I (Interests) and T (Taxes) on the final net profit (E)

capability of paying back the money, meeting the deadlines, Taxes(Government), investors

High level managers => Financial owners, fiscal, tax, loan, ...
owner of the company, align to gain more ...

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

+250 indicators!!!!

Shareholders' perspective (1)

* check the formula before using reports! they are customized in different situation

Why Ratios? potential biases due to the size!

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

It measures the "interest rate" on shareholders' equity, i.e. how much they earned on the investment they made in the company.

tells capability of company to remunerate to share holders
it is the potential remunerate the real is dividends!

** this is very biased because of denominator => Family business! (Equity is not normal), similar company use loan by banks, ... ===>> Always check the denominator

Shareholders' perspective (2)

we are in shareholder prespective, so everything arround the net profit

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

composition of rev and cost

It is also known as "*bottom line margin*"

It measures the percentage of profit that shareholders can retain from revenues (i.e. the starting point of Income Statement)
The impact of the operating, financial and fiscal activities on NPM should be analysed

Shareholders' perspective (3)

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

Cashflow statement

Income Statement

Dividends are paid in next years, The reports are published in April, may so the net profit is not identified yet.

It measures the percentage of net profit that is returned by cash to shareholders.

It is the "real" monetary reward of shareholders

… and not always the higher the better it's better to invest the money inside the company

** when high level of dividends is paid, there is a red sign!!! ==> pleasing the shareholders.

collecting money from bank has cost!

Strategy of company to grow

Engagement of share holders!

only apple and google pay dividends due to high amount of cash in company

dividends are related to the net income of the last year! (when negative!?? => it is paid by cash accumlated by last years)

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.

Which of the following ratios is the most informative for financial analysts?

I need all of them!!

Return On Equity — problem of the denumenator =< over under capitalized

Net Profit Margin — True !

Payout Ratio

They are very similar

I have no idea

Shareholders' perspective (4)

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

leakages

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

Middle line managers Clevels

$$NPM = \frac{Revenues}{Revenues} - \frac{Operating\ costs}{Revenues} - \frac{Net\ financial\ costs}{Revenues} - \frac{Taxes}{Revenues}$$

$$NPM = 1 - \frac{Operating\ costs}{Revenues} - \frac{Net\ financial\ costs}{Revenues} - \frac{Taxes}{Revenues}$$

ROS

The impact of the operating, financial and fiscal activities on NPM should be analysed.

You have to have answers of WHYs and predict the future!

Overall company's perspective (1)

middle line manager prediction for future depends on here!

*** focus is max. the EBIT => as a result the Net income will be increase

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

all the asset available

Limitation is that all of them are monetary (Tangible)

other country => ROI

It measures the ability of managers to generate profit by using company's assets. It is also used in managers' internal evaluation.

by decreasing the denominator there are risks of not investing and losing the competitive market.

Sustainability is important!

every year due to D&A this fraction increase if we don't create more value!! check the absolute number!

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.

Overall company's perspective (2)

always higher than ROA

ROI (accurate than ROA)
(Return on Invested Capital)

$$= \frac{\text{Operating Profit (EBIT)}}{\text{Total Assets – Liabilities without an explicit interest rate (payables)}}$$

ROI >> Co of Cap. is important
compare them to cost of capital

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

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

ROCE
(Return On Capital Employed)

$$= \frac{\text{Operating Profit (EBIT)}}{\text{Equity + Non-current Financial Liabilities}}$$

capital by shareholders + NC L.

Currents are not invested! long term debts / funding strategy

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

intersting insights on funding strategy of the company

Which of the following ratios is the most used by financial analysts?

in large company mostly they are the same

Return On Assets

Return On Invested Capital

most used !!

payable are not part of investment strategy

Return On Capital Employed

current liabilities are also important! and sometimes they are a portion of a long term debt.

They are very similar

I have no idea

Overall company's perspective (3)

Operating Profit Margin *(also known as Return On Sales – ROS)* = $\frac{\text{Operating Profit (EBIT)}}{\text{Revenues}}$ Return!

It measures the margin % that can be retained from revenues

Typically, there is a psychological threshold on the ROS. It should be at least 10 percent.

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

* Efficiency

you should rotate this asset to generate revenues (output/input)

Typically, there is a psychological threshold on the ATR it should be at least one.

It identifies the capability of the company to manage assets efficiently for generating revenues

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 (1)

1. Banks &
2. Bond holders

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

- Ratios commonly used under the stakeholders perspective are:

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.

Debt-to-Equity Ratio $\left(\frac{D}{E}\right) = \frac{\text{Liabilities}}{\text{Shareholders' Equity}}$

two block of right side

(in practice we use debts)

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.

I

Interest Coverage Ratio (ICR) $= \frac{\text{Operating Profit (EBIT)}}{\text{Financial Expenses}}$

other formula : EBIT / interest cost (Only F E of the bank and bond holders)

all the financial cost in the income statement

Cost of Debt $= \frac{\text{Interest Costs}}{\text{Debt with explicit interest rate}}$

bank debt + Bonds

missing dividends

Stakeholders' perspective (2)

- Ratios commonly used under the stakeholders perspective are:

T

$$\textbf{Effective Tax Rate} = \frac{\text{Taxes}}{\text{Pre-tax Profit (EBT)}}$$

It measures the effective weight of taxation on the company's profit

Risk / Operational Efficiency Matrix (1)

more high risk, more interest from bank

if the average is less, the matrix is not good

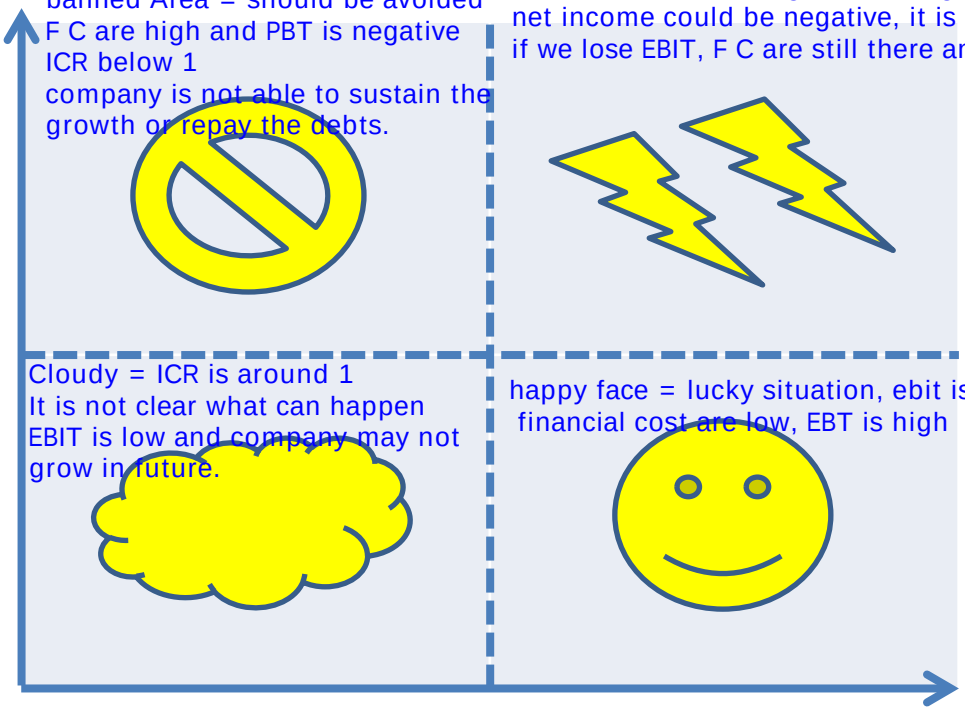
$\left(\frac{D}{E}\right)$

Assumption => High Risk

I >>

average
of industry
<<around 3>>

I <<



ROA

average at least of 80% of the revenue of market

guess why the average of the industry is this!

median is better than average where the number of players are less (Check!!!)

average
of industry

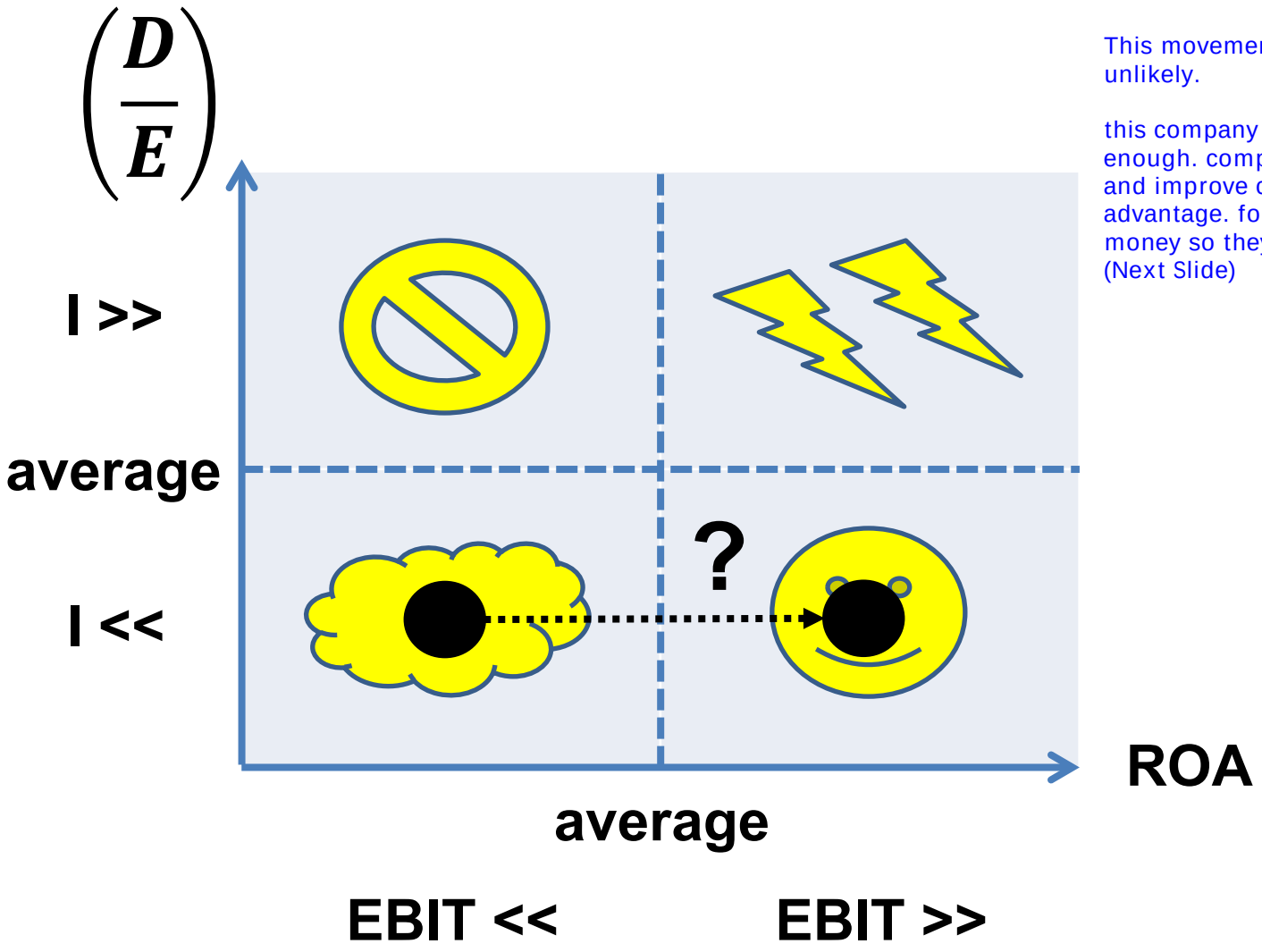
capability of generating EBIT

EBIT <<

EBIT >>

food and bavarerages

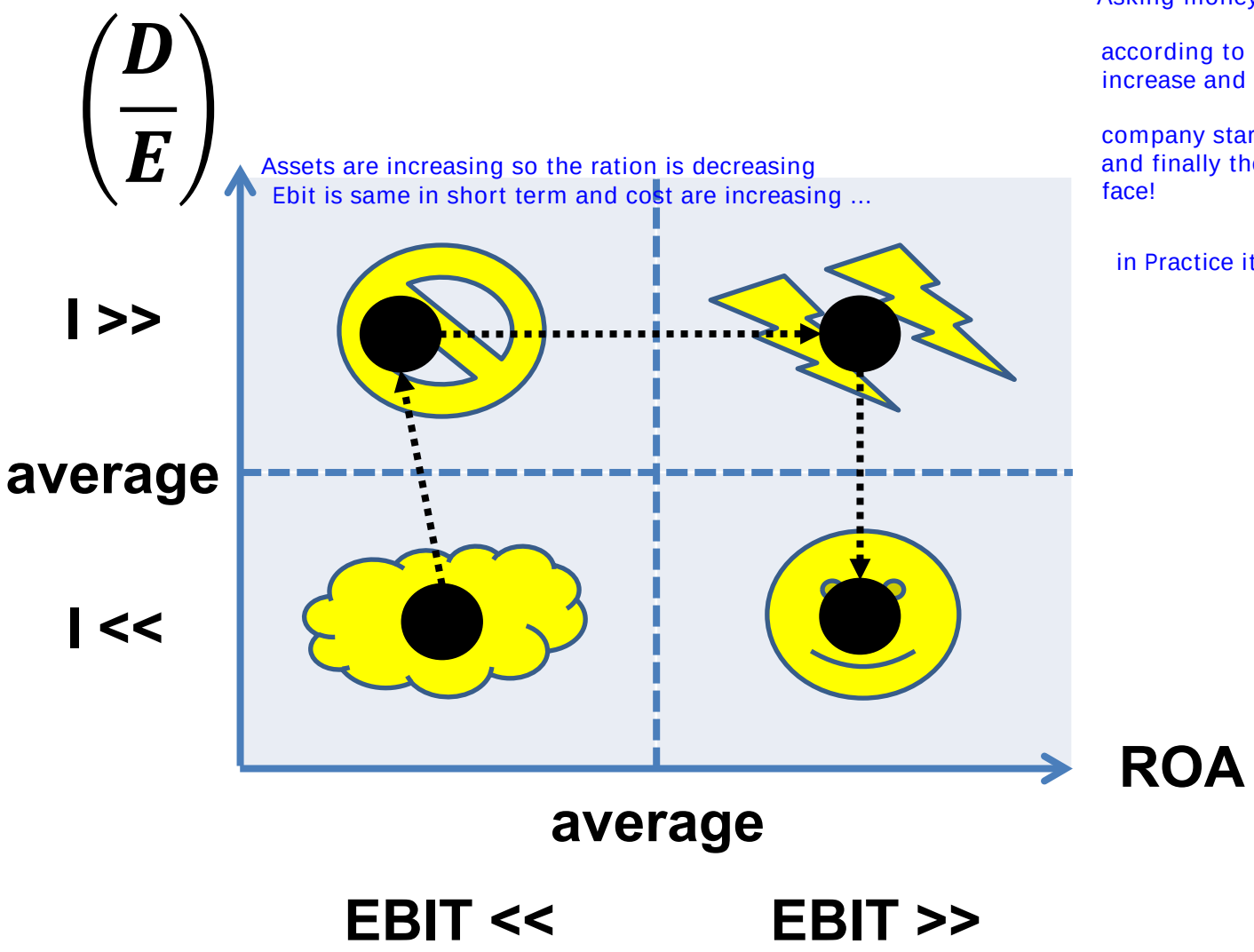
Risk / Operational Efficiency Matrix (1)



This movement is possible unlikely.

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

Risk / Operational Efficiency Matrix (1)



Asking money from banks

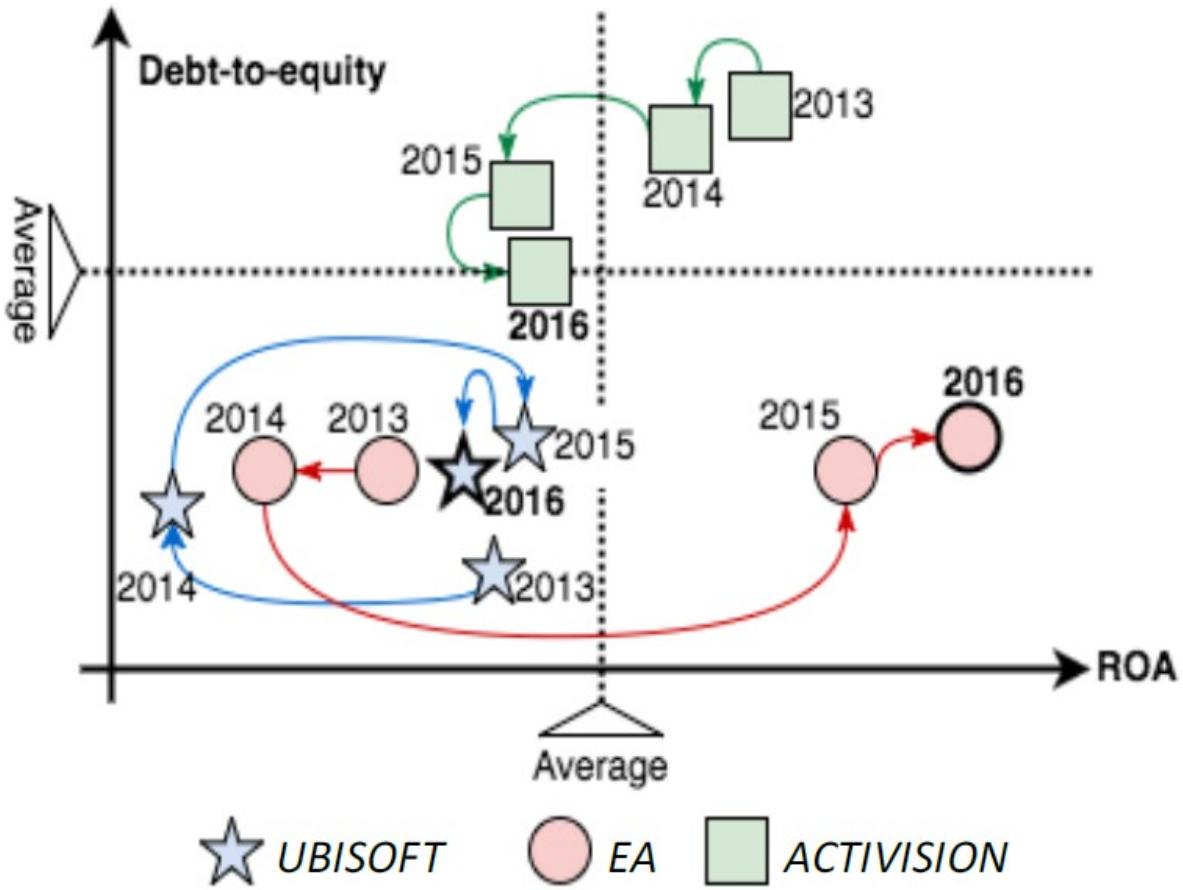
according to investments, Ebit will increase and move to right

company start to repay the debts and finally they move to happy face!

in Practice it's harrrrd!

Risk / Operational Efficiency Matrix (2)

this matrix is for manufacturing comapnies
so the compatitve advantage is based on PPE



Liquidity Analysis

capability 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" to existing present obligations**, i.e. the ability of the company to meet its financial obligations when claimed by owners of related rights

- Liquidity analysis firstly asses 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**, analysing "liquidity" items in the Balance Sheet
  - **Cash Flow perspective**, analysing "liquidity" items in Cash Flow Statement

not agreed globally

Liquidity Analysis – Working Capital

- **Net Working Capital is the amount of money needed** (or generated) during the working capital cycle and can be measured by

Net Working Capital =
Current Assets – Current Liabilities

generate enough cash to cover the liablities

time isn't seen in this calculation!

* focus on this one more!

Net Operating Working Capital =
Receivables + Inventory – Payables

cashflow statement (direct and indirect)

must be more than zero

Liquidity Analysis (1)

- Ratios commonly used under the assets-liabilities perspective are:

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

allow to compare with different size

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

to be very prudent, only considering assets that become cash.

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

inventory is excluded

They measure to what extent company's current assets (in the quick ratio further refined by isolating only most liquid assets) are readily available to pay off its current liabilities.

Which one of the following statement is correct? GRAY

Current Ratio should be preferred for being comprehensive

Quick Ratio should be preferred for being prudent

Correct!

Both ratios should be calculated

the industry, the company, the likelyhood of different assets to become cash
in some industry it's necessary to consider both. like Food (expired), Fashion (season), ICT (technology evolution)

One of the two ratios should be preferred case by case

... Nestle !?!?!?!?! must be persuasive! check the products composition, their value, specs.

I have no idea

Liquidity Analysis (2)

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

zero inventories (TOYOTA)

must be high. with small amount of inventories, should generate revenues

it's hard to align sales and production

Days Sales Outstanding (DSO)
Average Collection Time of Trade Receivables (days) = $\frac{\text{Trade Receivables}}{\text{Revenues}} \times 365$

60, 90, ...

average delay the customers allowed to pay for the product

Days Payable Outstanding (DPO)
Average Payment Time of Trade Payables (days) = $\frac{\text{Trade Payables}}{\text{Purchases}} \times 365$

Not CGoS, Raw Mat., ...

suppliers allow us to postpone the payment

trade .... => operating activity

Which one of the following statement is correct?

DSO should be higher than DPO

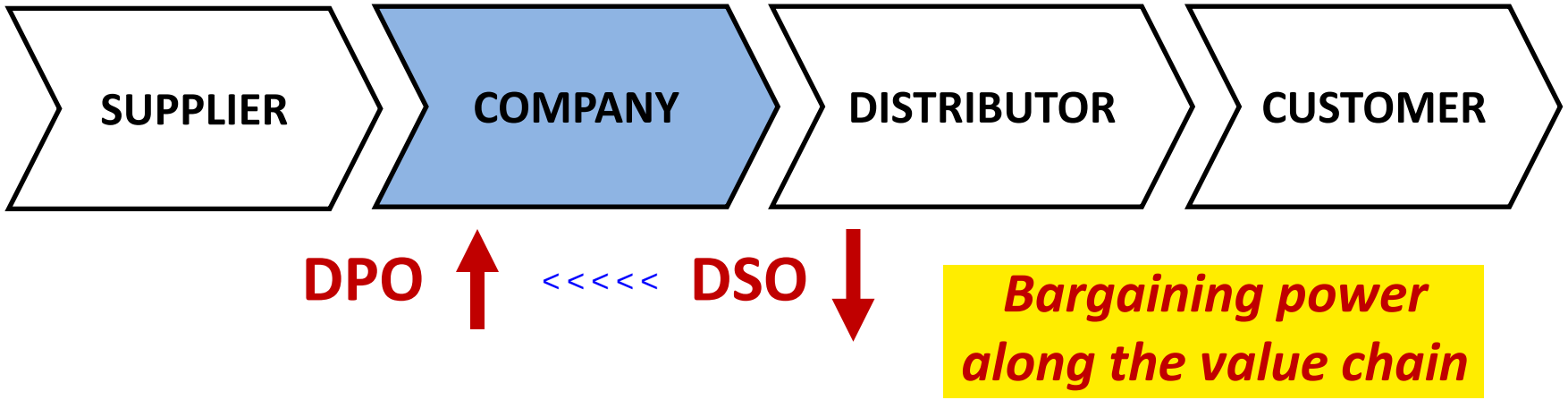
DSO should be lower than DPO

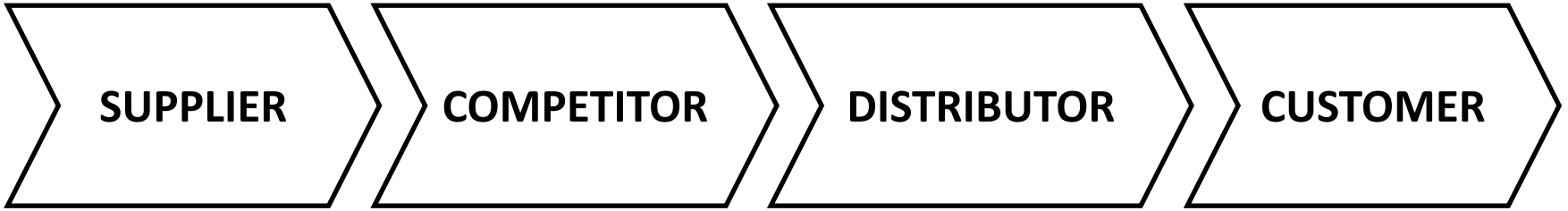
DSO should be similar to DPO

I have no idea

Correct Answer! it's very case specific.

Liquidity Analysis (2b)





???

Strengthening the total value chain
Co operate and compete

Liquidity Analysis (3)

- Ratios commonly used under the cash flow perspective are:

Cash Flow-to-Debt Ratio = $\frac{\text{Operating Cash Flow}}{\text{Debt Liabilities}}$ Bank debts + Bonds

the opposite is better => number of years needed to pay the debts from operating activits
check each absolute number. not always higher better. Risk of not investing

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

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)

Capex low => may not invest in the company
Check the value of assets over time!

Liquidity Analysis (3)

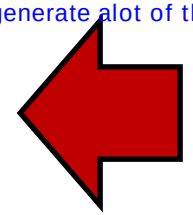
BCG Main assumptions => company can't ask money from shareholders and banks

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

CASH FLOW STATEMENT

+ OPENING CASH

+ CASH FLOW FROM THE OPERATING ACTIVITIES Cash Cow generate alot of this!!!!!
+ EBIT
+ D&A
- Δ OWC
- Financial costs
- Taxes

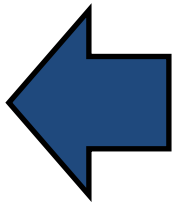


what if negative !?
when OCF is negative! they are absorbing cash

can't be commented => why the OCF is negative???

ROE is negative! why?

+ CASH FLOW FROM THE INVESTING ACTIVITIES
- CAPEX mostly just this
+ Disposal of assets sell asset



only way

+ CASH FLOW FROM THE FINANCING ACTIVITIES
± BANK LOANS
- DIVIDENDS
+ NEW SHARES

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

+ CASH AT THE END

The Liquidity Matrix

10 Years ????

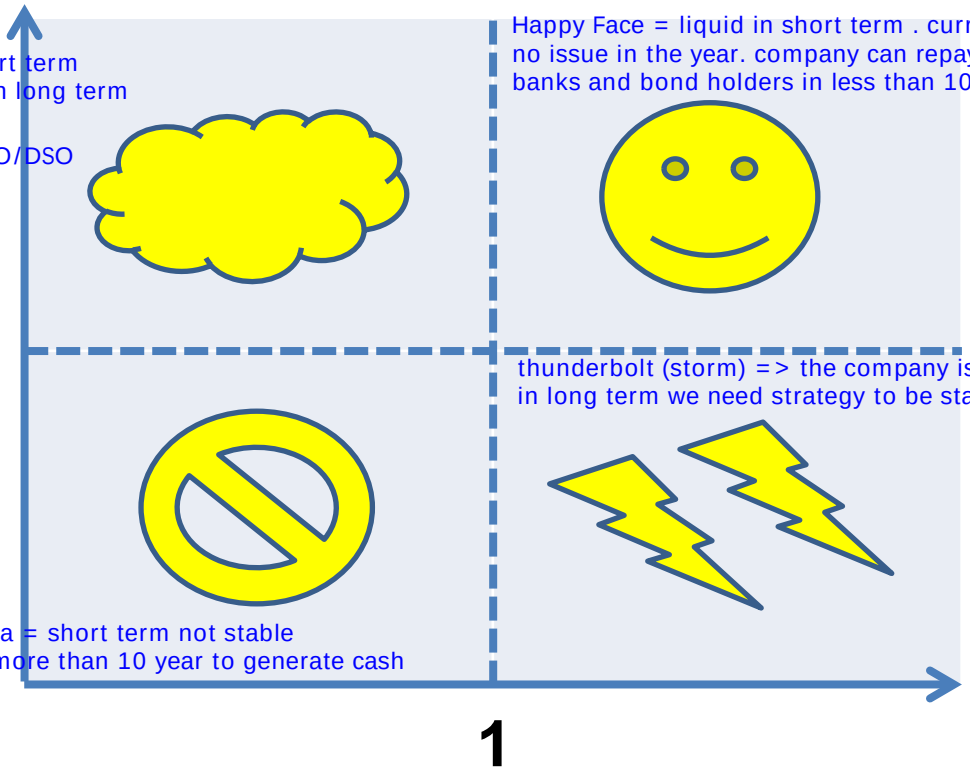
see the company is liquid both short and long term.company will generate enough cash

non current

Cash-to-Debt

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



Absolute Indicators: Residual Income

only with same SIZE!!! company = Similar Revenues
proxys of size => 1. Revenue > 2. Employees (Full-time) > 3. Market Captalization
value of shares on the market

generating enough value

- Residual Income is an accounting measure of net operating income minus the return expected by stakeholders and debtholders (WACC)

we need enough resources to pay dividends
RI try to capture this. ebit = 0 is not enough.

Residual Income (RI) = EBIT – K* Invested Capital

middle line manager, difference of revenue and operating cost must used to pay the cost of capital
shows how much money will remain when company pays to share holders -> remaining value

where:

- ❖ K is the cost of capital of the company = WACC

average cost that company sustain to collect money to share holders and banks

*** ❖ Invested Capital = E + Financial Liabilities

bank debts

Risk capital (shareholder)
Bank (Debt Capital)

RI Vs EBT => We take out the dividends and shareholders

retained earning => not paid dividends ???????

Residual Income vs ROI

RI = EBIT – WACC * I > 0

should cover!
+ Taxes

ROI = (EBIT / I) > WACC

ROI
in all company must be like this

* Project

there is conflict between these two:
- two metrics suggest different strategies, or alternatives, ...

Which one the following statements is correct?

- ROI should be preferred to RI
- RI should be preferred to ROI
- They are very similar
- I have no idea

Residual Income vs ROI (2)

in theory RI is important

RI = EBIT – WACC * I > 0 **ROI = (EBIT / I) > WACC**

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

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? infromation! if we can risk so go with RI (confident darim)

Fast moving industry => ROI

Absolute Indicators: Cash Flow ROI

99% can't be computed

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

we don't have this. no idea of the value of the asset in market (Fair Value)

should be higher than 1 !! repay the cost of capital

- It is a proxy of the capability of the company to repay its resources and meet the expectations of both shareholders and debtholders
- CFROI > WACC

Summary and conclusions

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

Altman's Z SCORE (1968)

probability of bankruptcy in next year !

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

Z score has customized for different situations !!

> 3 → SOLID SITUATION

Gray Zone!

< 1.8 → BANKRUPTCY

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

** Project

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

A few final reflections …

- "It is very easy for people approaching ratios for the first time to go through a series of reactions, initially seeing the calculation of the ratios as an end in itself and then later asking what use the ratios are for"

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

- Remembering that:
  - not all the ratios have the same relevance
  - ratios pose questions more than providing answers