

Business decision-making: methods and tools

ANALYSIS OF FINANCIAL RATIOS

AY 2019-2020

Agenda

- Introduction
- Profitability analysis
- Liquidity analysis
- Analysis of financial soundness
- Exercise

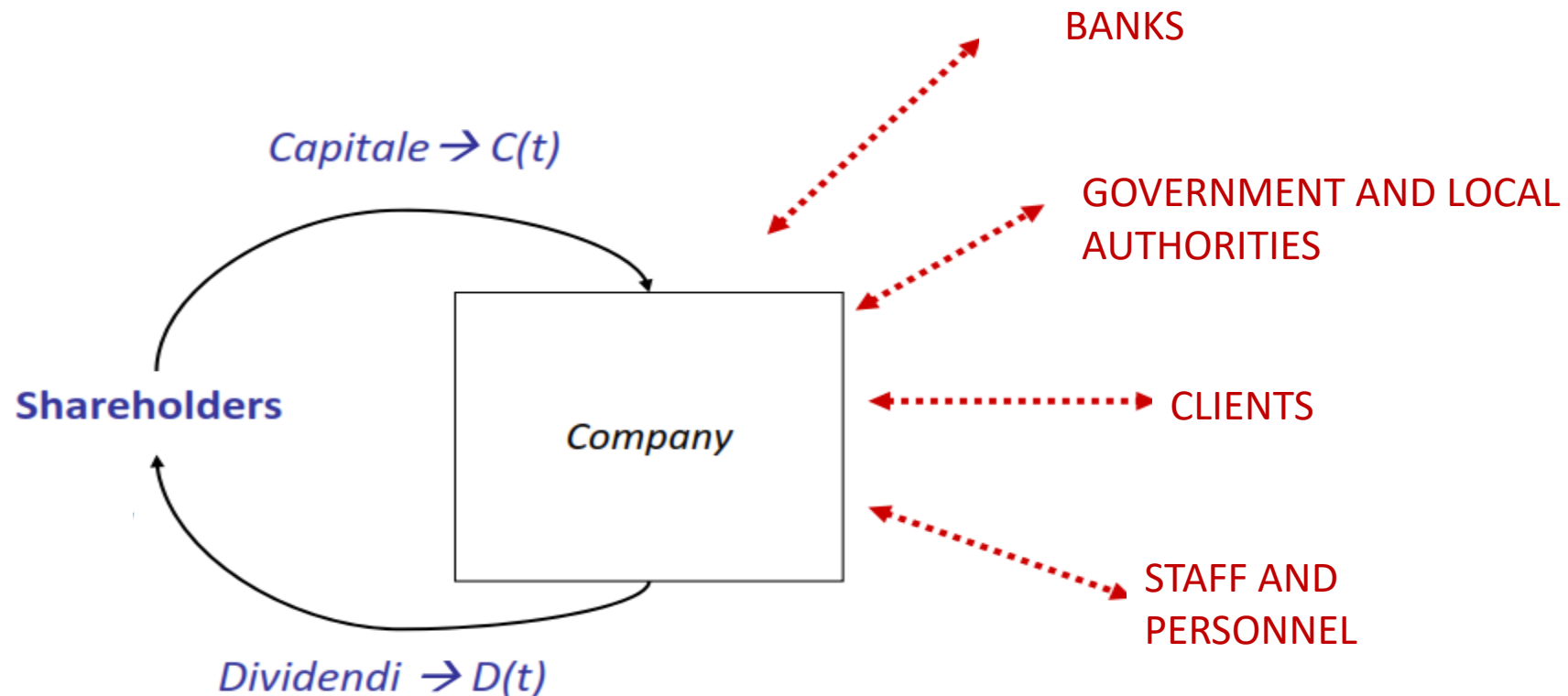
Stating the problem

Imagine you are an investor, or a shareholder, or a manager.....

....by reading the Balance Sheet and the Income Statement are you able to collect synthetic information on the overall trend of the company?

Analysis of financial ratios

- OBJ: to provide **stakeholders** different **synthetic information** with respect to the **overall trend** of the company



Ratio Analysis

- Ratio analysis is used to:
 - Evaluate the trend of the company
 - Analyze the profitability of different management
- 3 classes of information → 3 types of Ratio Analysis

LABEL	INFORMATION PROVIDED	RELATED INDEX ANALYSIS
ECONOMIC BALANCE	Ability of the firm to generate revenues and therefore it shows the ability of the firm of remunerating the productive factors	PROFITABILITY ANALYSIS
FINANCIAL BALANCE	Ability of the firm of paying for its obligations through its own resources	LIQUIDITY ANALYSIS (current assets)
ASSET BALANCE	Ability of the firm to implement and efficient management of its own capital	FINANCIAL SOUNDNESS (debt and solvency analysis)

How to calculate the Index (1/2)

- The Index analysis is based on a defined and structured system of measures (index)
- There are two main typologies of Index:
 - Relative index: they consider two values of the Financial Review
 - Absolute index: they are obtained by the information contained in the Financial Review or by a reclassification (e.g. Net Income)
- The analysis could be:
 - Inter-period
 - Inter-firm
- To calculate the indicators we MUST define how to calculate them (i.t. the metric). The same calculation logic is required to ensure the coherence of comparability

How to calculate the Index (2/2)

- We can distinguish between two main categories of indicators:
 - Index based on the rate between **flow values** (Income statement)
 - Index based on the rate between **flow value and stock value**



In this second case, we MUST define if we use **initial value or final value**

Preliminary remarks

- Comparability problems arise:

- The Income Statement could be drawn up by nature or by destination
- Different levels of details in the items of the Income Statement



Notes to the Financial Statement as a fundamental tool to support the analysis. In fact:

- Comparability is ensured by the presence of additional information
- If additional information are not available, it is possible to identify the «non-comparability» areas

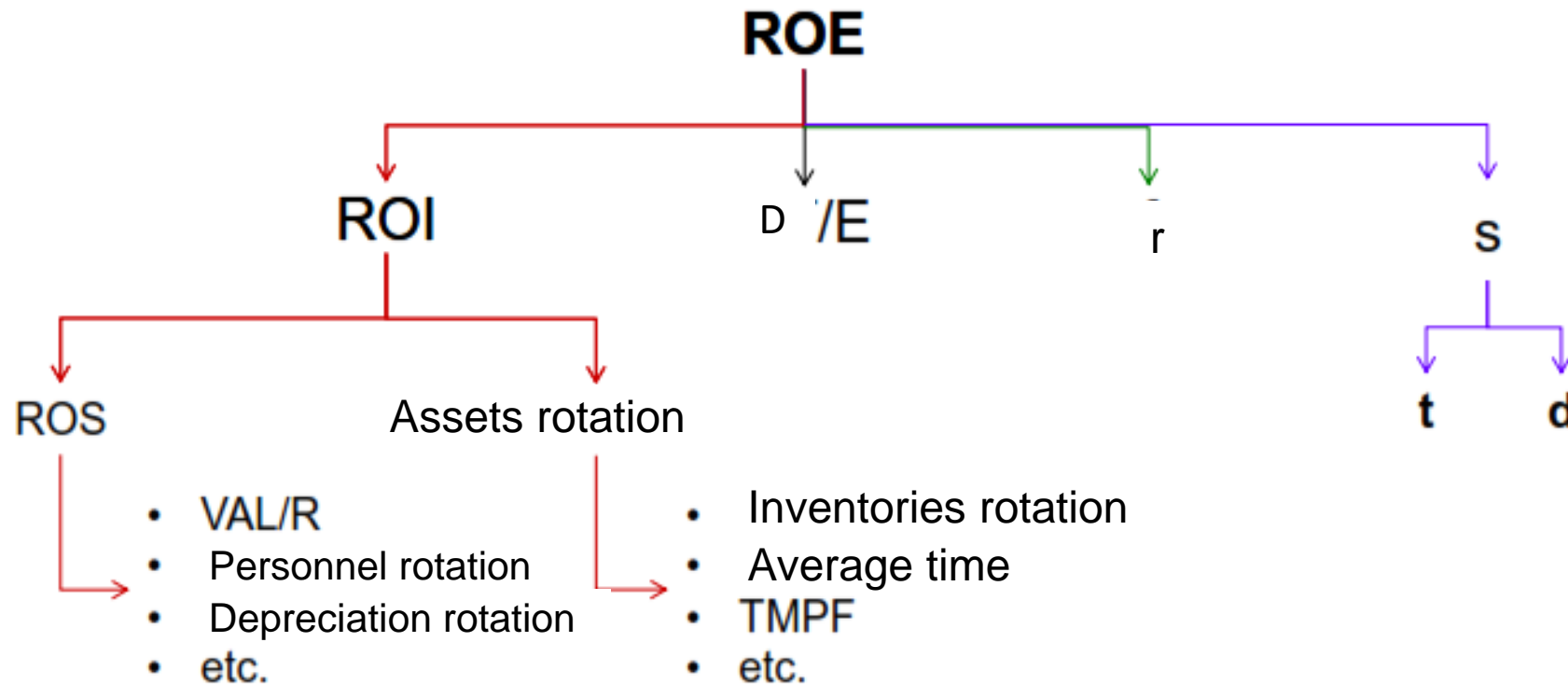
Ratio Analysis limitations

- Ratios are presented on a percentage basis
- Relative size is ignored
- It is assumed that all numbers used are correct
- If the numbers are not reliable, ratios are not particularly usefull

PROFITABILITY ANALYSIS

Profitability analysis

- Center of the analysis:
 - The **profitability** of the firm with respect to **shareholders**
 - The **determinants** of the **whole profitability** through a **multi-level analysis**



Profitability Analysis: ROE – 1st level

- The profitability analysis starts with the generation of profits with respect to shareholders:

$$\text{ROE (Return On Equity)} = \text{Net Profit} / \text{Equity}$$

- ROE provides information of the whole profitability result of the firm. Indeed, it shows the % remuneration of the issued capital of shareholders
- It is a synthetic measure that allows the shareholder to understand his/her own profit derived from the activity of providing capital to the firm.

Profitability Analysis: Leverage Analysis – 2° level

- ROE it is too synthetic for providing detailed information of the firm's profitability. More detailed index are required.....
↓
- (Financial) **Leverage Analysis**

It analyzes the contribution of different «management area» with respect to the complex firm's result. Specifically it analyzes:

- Operational management, financial management, extraordinary management, fiscal management
- Ability of managing the equity

↓

Which indicators could we use to provide information on each managerial area of the firm?

Leverage Analysis (1/3)

$$\text{ROE} = \{\text{ROI} + \text{D/E} * (\text{ROI} - r)\} * s$$

ROI = (EBIT) / total assets (Return on Investment)

- it represents the return on all the company's assets of the operating and financial activities
- OPERATING MANAGEMENT

D/E= Leverage ratio = Tot Liabilities - equity/Equity

- CAPITAL STRUCTURE

r= financial expenses (i.e. borrowing costs)/total liabilities (Borrowing costs/D) (also ROD, Return on Debt)

- average cost of liabilities
- FINANCIAL MANAGEMENT

s= Net income/income before taxes and extraordinary items

- EXTRAORDINARY MANAGEMENT

Leverage Analysis (2/3)

$$\text{ROE} = \{\text{ROI} + \text{D/E} * (\text{ROI} - r)\} * s$$

Operational management, ROI

Capital structure, D/E

Financial management, r

Extraordinary management, s

- The formula highlights that **operational management, financial management and extraordinary management** are **interrelated** for the **definition of the overall profitability** of the firm
- The **ratio** between **ROI** and **ROE** depends on the **relationship between ROI and r** (anche therefore from a good financial management)
- If $\text{ROI} > r$, $\text{ROE} > \text{ROI}$, it means that the company is able to generate «profit» from investment more than the costs of third means (liabilities)

Leverage Analysis (3/3)

- It is not worthwhile to increase over a certain level the level of indebtedness (D/E), $D/E = \text{leverage ratio} = \text{Liabilities/Equity}$
 - As the level of indebtedness increases, it is more likely that the average costs asked by third parties to finance the firm increases (= the perceived business risk increases)
 - ROI is a variable unpredictable and not stochastically defined



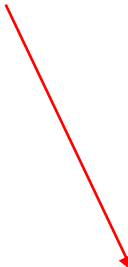
Equal variations of the profitability level related to the operational management (ROI) or of the cost of thirds' capital will result, with a higher impact, as higher is the ration leverage/indebtedness. And the business risk increases

Profitability Analysis: ROI

Operational Management

- ROI (Return on Investment) = Operating profit (E.B.I.T.) / tot. Assets

Income Statement
Revenues
+ Other Revenues
+ Changes in inventories and WIP
- Use/Consumption of raw materials
- cost of personnel
+/- depreciation and variation of value of non current activities
- Other operating costs
OPERATING PROFIT



Profitability Analysis: ROS and AR – 3rd level

The third level analysis identifies the **ROI determinants**

ROS*Assets rotation

THIRD LEVEL

- **ROS (Return on Sales) = EBIT/sales (or Value of production)**
 - It describes the ability of maintaining the turnover as profit (= ability to maintain lower cost with respect to a specific level of revenues) and/or the ability of selling goods at a higher price compared to production costs
- **AR (Fixed Asset rotation) = Sales/tot Assets**
 - It describes the assets that are able to create revenues. If RA increases, it means that:
 - A firm is able to create a higher revenues with the same resources
 - A firm is able to obtain the same revenue with less resources

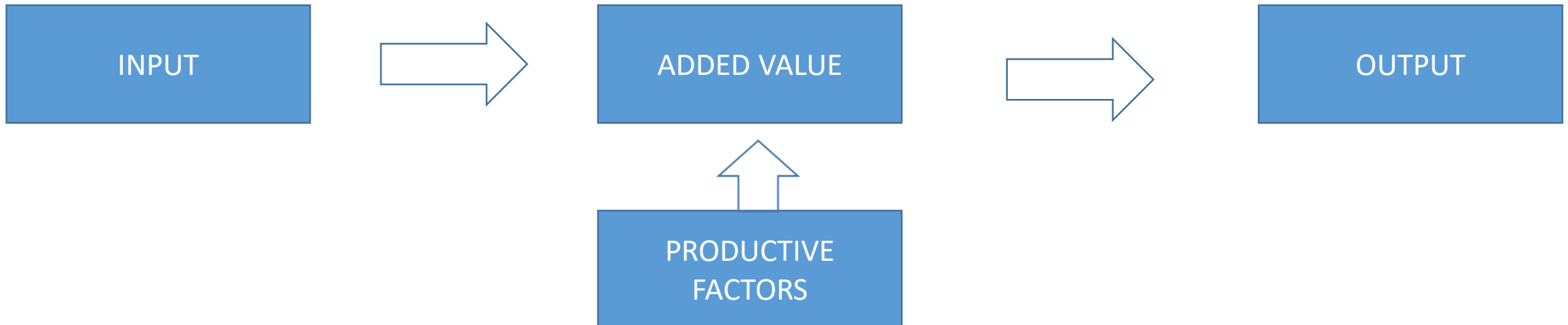
Profitability Analysis: ROS

ROS= EBIT/ sales

= sales – material consumption* – services – employee expenses – depreciation

* *Material consumption = purchases + services + initial inventories – final inventories*

It describes the ability of increasing the value of input used to produce the output
Stated otherwise, it describes the degree to which the firm is able to use its own
production factors in the process of transformation from input to output.



Profitability Analysis: determinants of ROS and AR – 4° level

Determinants of AR

- Inventories rotation = $\text{cost of raw material, ...} / \text{Inventories}$
- Fixed assets rotation = $\text{sales} / \text{property, plant, equipment}$
- Total assets rotation = $\text{sales} / \text{total assets}$
- Receivables rotation = $\text{sales} / \text{accounts receivable} * 360$ (or 12)
 - The higher is the value of receivable rotation the higher is the risk not to receive payments from creditors
- Payables rotation = $\text{sales} / \text{accounts payables} * 360$ (or 12)
 - High value of payable rotation:
 - ✓ The firm has a high contractual capacity with respect to suppliers
 - ✓ The firm is not able to pay promptly

Profitability Analysis: determinants of ROS and AR – 4^o level – receivables rotation

Receivables rotation= sales/ accounts receivable *360

- Sales= 6.000
- Total amount of receivables= 3.000
- Receivables rotation= 6.000/3.000
- Average time to collect receivables: $(3.000/6.000)*360= 180$ days
 $(3.000/6.000)*12 = 6$ months (2 time/year)

If we know the day/month to collect receivable, we could calculate the value of credit:

- Days*revenues/360
- Months*revenues/12

Some considerations

- ROE = whole profitability of a company
- ROI= profitability of a business area
- Low level of «rapidity»
- Low orientation to the long period – maximization of results related to the short-time period
- Reliability of indicators – specific rules

LIQUIDITY ANALYSIS

Liquidity Analysis: short-time period

- The objective is to monitor the **firm's creditworthiness** (i.e. ability to pay) during the short time period
- Current ratio = current assets/ current liabilities
- Quick ratio (acid test) = (current assets – inventories)/current liabilities
 - Usually, the firm uses only one of the two indicators since they are very similar
 - QR MUST be > 1 = the current assets are able to re-pay for current liabilities with external funding source
- Net Operating Working capital = commercial credits + inventories – commercial debts
 - $CD < (CC - INV)$ = A high value could indicate that the firm has too many com. credits or inventories compared to comm. Debts (cash income comes later compared to cash-out)
 - $CD > (CC - INV)$ = The firm is able to «collect» cash, moving forward the payment

Liquidity Analysis: long-time period

- The objective is to monitor the financial balance in the long time period
- Operating Cash Flow/Liabilities
- Operating cash flow = EBIT + depreciation and amortization

ANALYSIS of FINANCIAL SOUNDNESS

Financial soundness: short-time period

- Object of the analysis: structure of investments and loans (financing)
- Different Index; the most important are:
 - Ratio of financial autonomy (FA) = $\text{Equity} / \text{tot. liabilities}$
 - Financing flexibility (FF) = $\text{current liabilities} / \text{liabilities}$

EXERCISE