Advanced Accounting
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Lesson 12
The DuPont Formula

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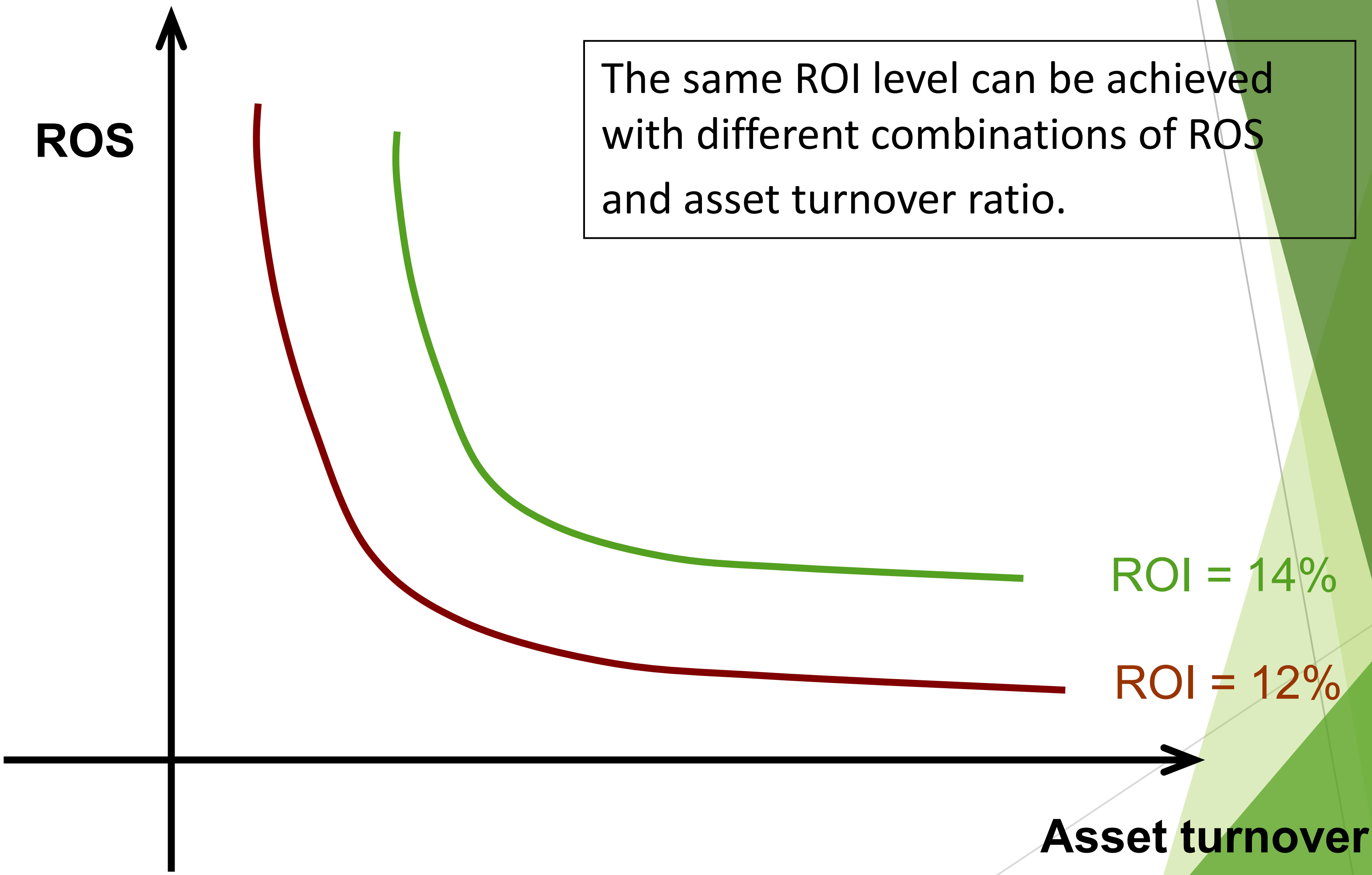
Relationship between profitability and 'efficiency'

$$ROI = \frac{EBIT}{Assets} = \underbrace{\frac{EBIT}{Sales}}_{\text{ROS (Return on Sales)}} * \overbrace{\frac{Sales}{Assets}}^{\text{Asset turnover ratio}}$$

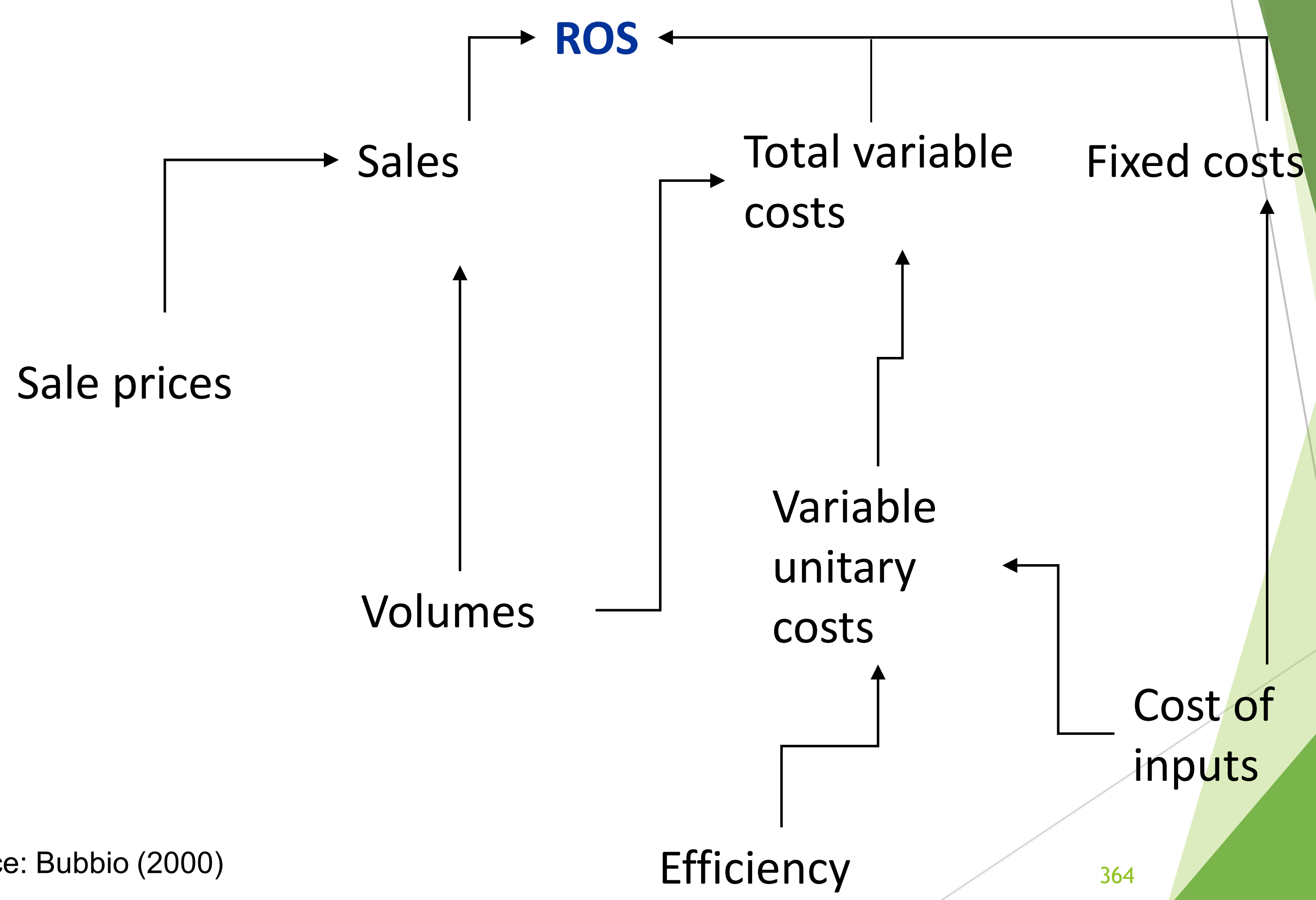
ROI is determined by asset turnover ("how many times" asset are renewed in a year) and profit margins on sales.

ROS, asset turnover and ROI

The same ROI level can be achieved with different combinations of ROS and asset turnover ratio.

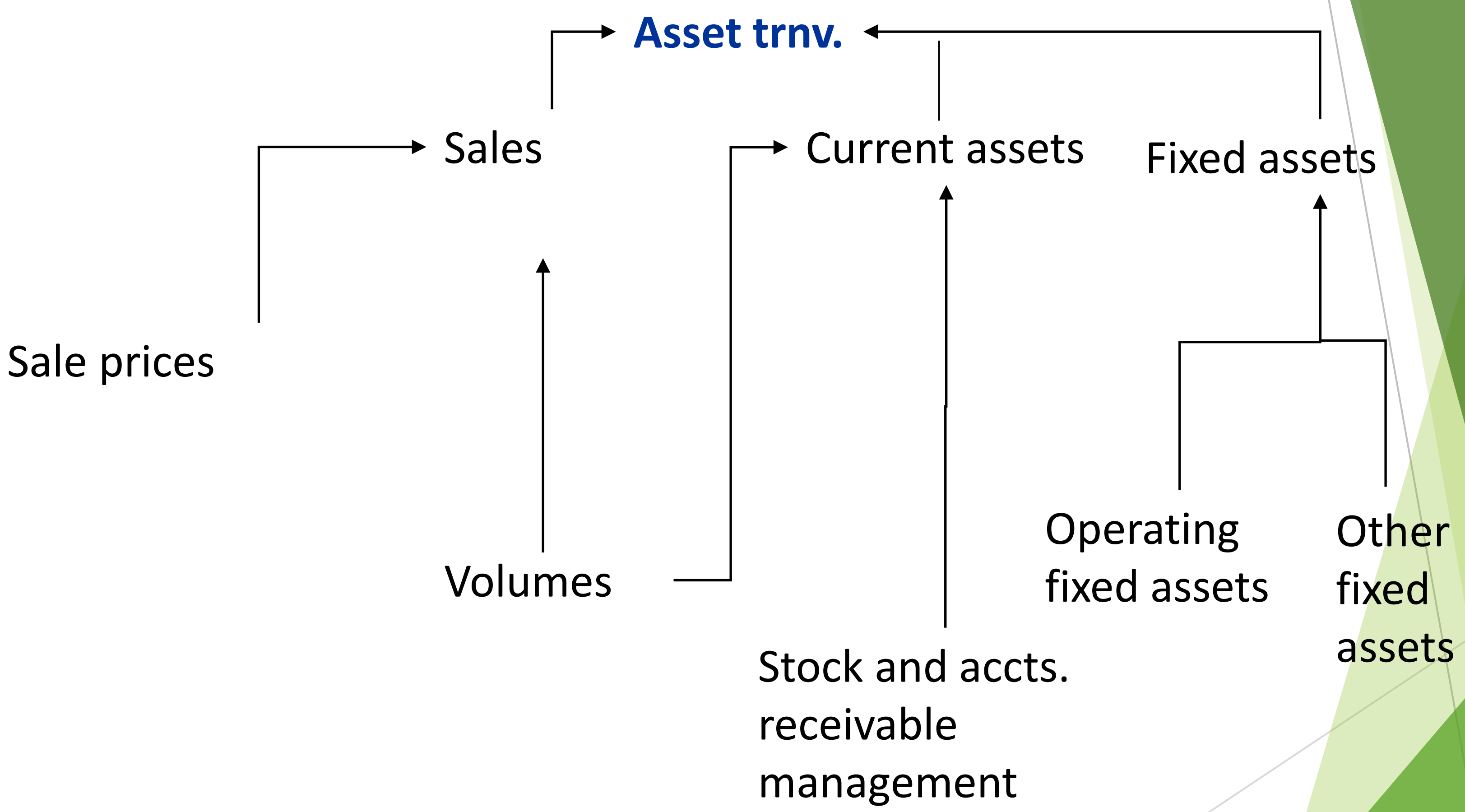


Determinants of ROS



Source: Bubbio (2000)

Determinants of asset turnover



Source: Bubbio (2000)

ROS, asset turnover and ROI

Increase of asset turnover due to:

- Sales increase → positive if no change in sales mix or selling price
- Assets reduction → investigation needed → it could be caused by a failure to mantain non-current assets with the risk that operating efficiency is affected.
- Both of them.

Low asset turnover....

- Excess production?
- Bad inventory management?
- Poor collection practices?

ROS, asset turnover and ROI

How is possibile to improve?

- Increase revenues
- Liquidate assetes (obslolete/unused)
- Leasing
- Improve efficiency (better use of resources)
- Accelerate account receivables
- Better inventory management

ROS, asset turnover and ROI

Consider the following information, for last year, concerning two different businesses operating in the same industry.

	Andy plc	Billy plc
EBIT	20 m	15 m
Assets	100 m	75 m
Sales revenue	200 m	300 m

Andy's ROI = ?
Billy's ROI = ?

Andy's ROS = ?
Billy's ROS = ?

Andy's Asset Turnover = ?
Billy's Asset Turnover = ?

ROS, asset turnover and ROI

Consider the following information, for last year, concerning two different businesses operating in the same industry.

	Andy plc	Billy plc
EBIT	20 m	15 m
Assets	100 m	75 m
Sales revenue	200 m	300 m
ROI	**20%**	**20%**
ROS (EBIT/Sales)	**10%**	**5%**
Asset turnover (Sales/Assets)	**2**	**4**

The ROI for each business is identical. The manner in which that return was achieved by each business is quite different.

A relatively high asset turnover can compensate for a relatively low operating profit margin. And viceversa.

The DuPont Formula

$$ROE = \frac{NET\ PROFIT}{EQUITY}$$

$$ROE = \frac{NET\ PROFIT}{EQUITY} * \frac{SALES}{SALES} * \frac{ASSETS}{ASSETS}$$

$$\boxed{ROE = \frac{NET\ PROFIT}{SALES} * \frac{SALES}{ASSETS} * \frac{ASSETS}{EQUITY}}$$

RETURN ON SALES

ASSET TURNOVER

CAPITAL STRUCTURE