

EFFICIENCY AND EFFECTIVENESS (2)

Measuring process performance



PRICE AS “HOMOGENIZATION FACTOR”



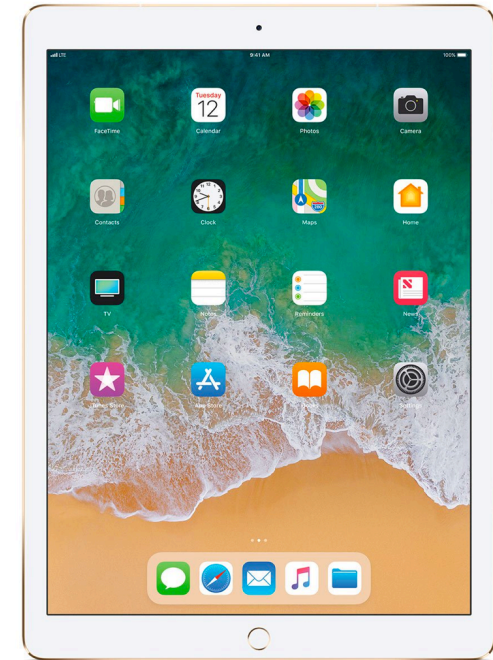
\$ 1,000

1 iPhone



\$ 2,000

2 iPhone equivalent



\$ 900

0,9 iPhone equivalent

Break even point in units

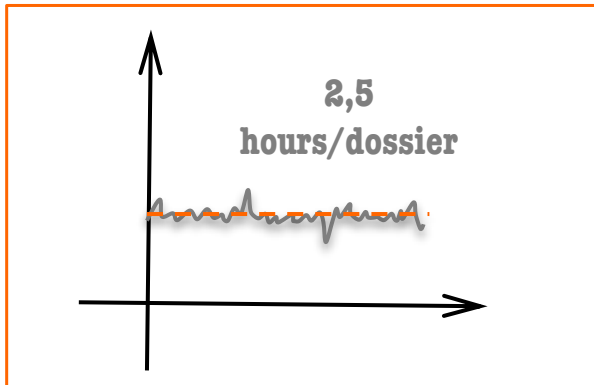


Break even point in total dollars

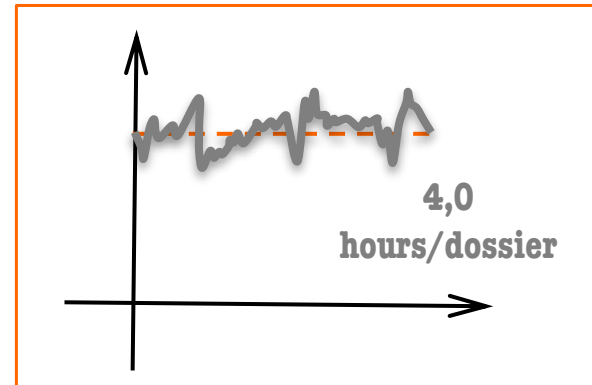
QUANTITY OF DIRECT MATERIALS USED



HOURS OF DIRECT WORK USED



DOSSIER TYPE 1



DOSSIER TYPE 2

$$\text{DOSSIER TYPE 2} = \frac{4}{2,5} * \text{DOSSIER TYPE 1}$$

WORK IN PROCESS

Direct Materials	476.905
Direct Labour	366.850
Manufacturing Overheads	660.330
Total Manufacturing Costs	1.504.085

Finished Products	3.554
WIP # 2	2.300
WIP # 1	4.500

Required:

Determine the cost of one product.

EQUIVALENT UNIT OF PRODUCTION

	WIP #1	WIP #2	Finished Products	WIP #1	WIP #2	Finished Products
Direct Materials	75,00%	20,00%	5,00%	75,00%	95,00%	100,00%
Direct Labour	0,50	1,25	0,25	0,50	1,75	2,00
Manufacturing Overheads	1,00	4,50	0,50	1,00	5,50	6,00
Total Manufacturing Costs						
	WIP #1	WIP #2	Finished Products	WIP #1	WIP #2	Finished Products
Direct Materials	€ 48,75	€ 13,00	€ 3,25	48,75	61,75	65,00
Direct Labour	€ 12,50	€ 31,25	€ 6,25	€ 12,50	€ 43,75	€ 50,00
Manufacturing Overheads	€ 15,00	€ 67,50	€ 7,50	€ 15,00	€ 82,50	€ 90,00
Total Manufacturing Costs	€ 76,25	€ 111,75	€ 17,00	€ 76,25	€ 188,00	€ 205,00
				37,20%	91,71%	100,00%



EQUIVALENT UNIT OF PRODUCTION

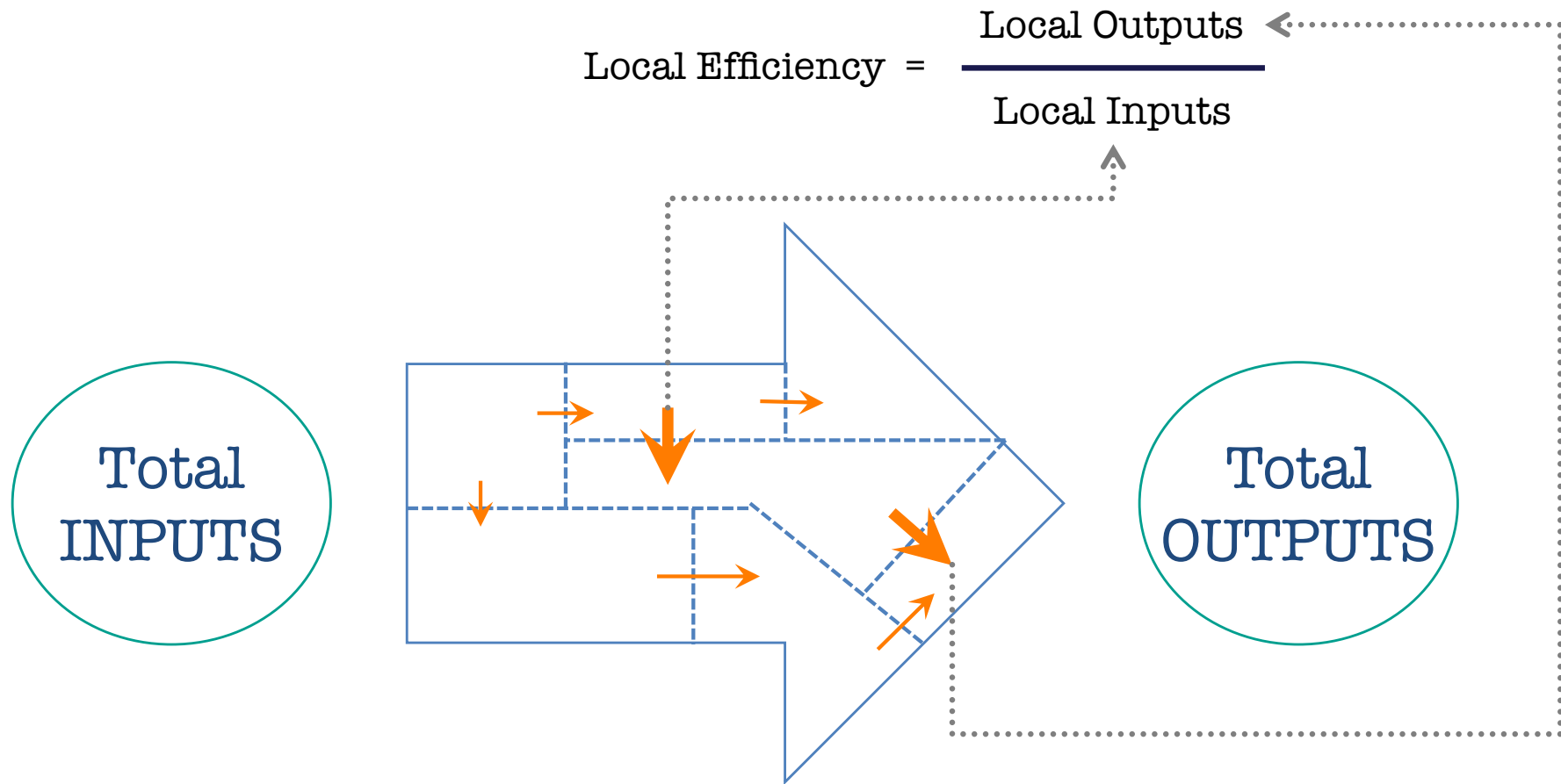
Direct Materials	476.905	7.337	€	65,00
Direct Labour	366.850	7.337	€	50,00
Manufacturing Overheads	660.330	7.337	€	90,00
Total Manufacturing Costs	1.504.085	7.337	€	205,00

Finished Products	3.554	100,00%	3.554
WIP # 2	2.300	91,71%	2.109
WIP # 1	4.500	37,20%	1.674
			7.337

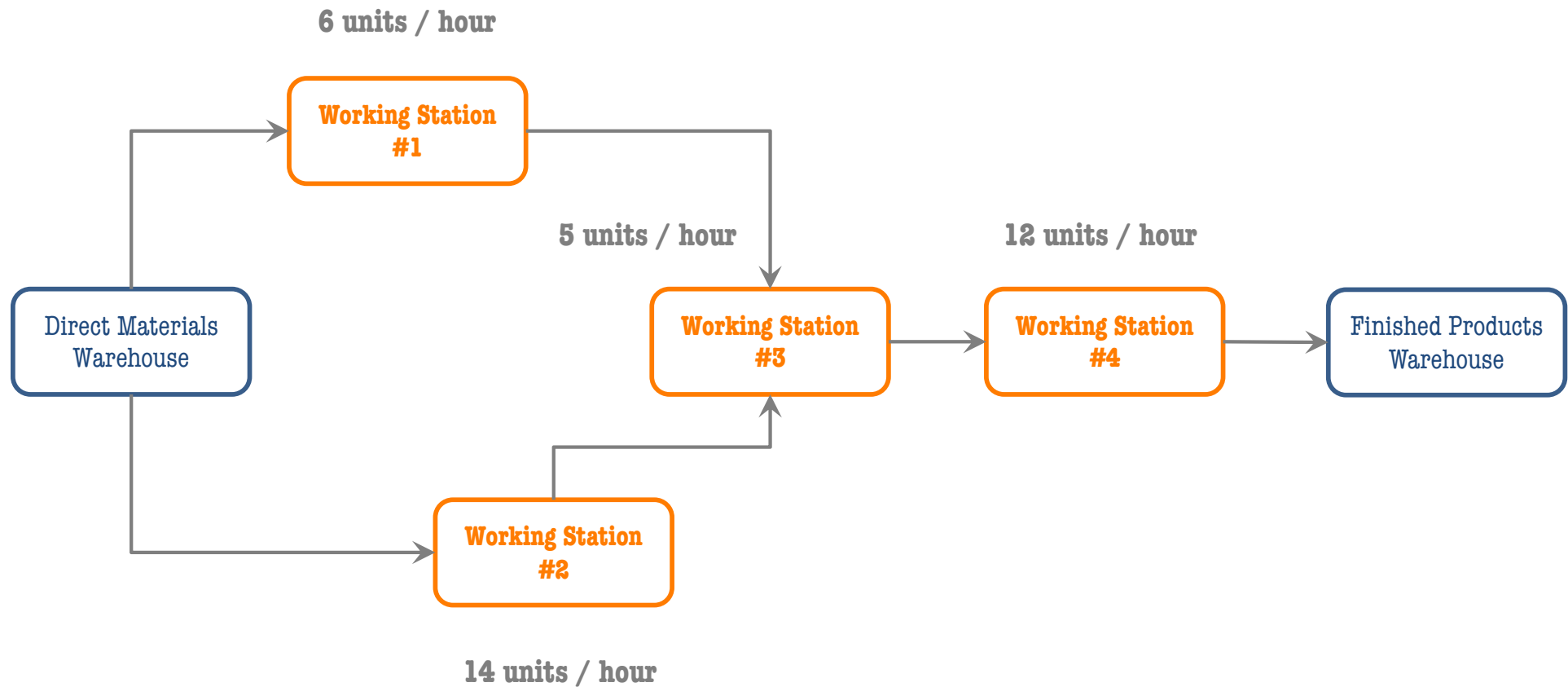
$$\text{Cost per unit} = \frac{1,504,085}{7,737} = 205$$



LOCAL EFFICIENCY



ANALYSIS OF A SIMPLE PROCESS

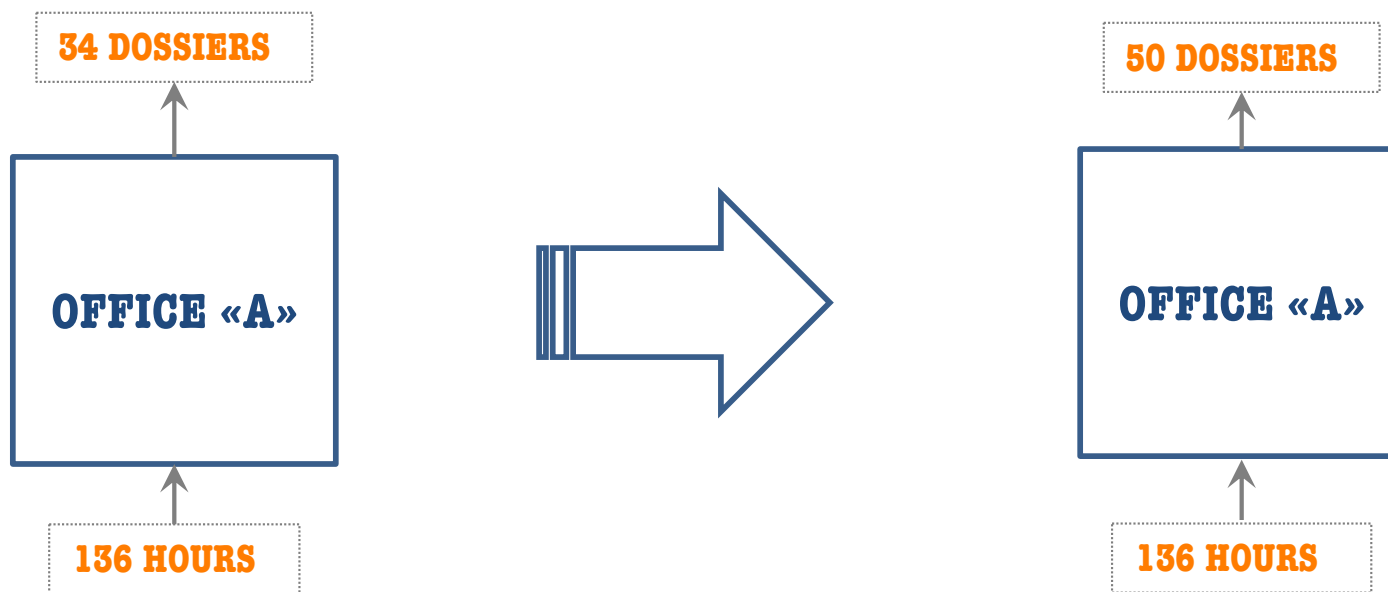


CAUTION IN INTERPRETING PARTIAL MEASURES



T_0

CAUTION IN INTERPRETING PARTIAL MEASURES



T_0

INVESTMENT IN TECHNOLOGY
workers are equipped with a new
information system

T_1

It should always be remembered that any measure of partial productivity cannot isolate the relationships of formally considered inputs and outputs alone.

MEASURING CHANGES IN PRODUCTIVITY

«Actual productivity ratios by themselves convey little information about productive efficiency or whether the company has improving or declining productivity.

It is possible, however, to make a statement about increasing or decreasing productivity efficiency by measuring changes in productivity. To do so, the actual current productivity measures are compared with the productivity measures of a prior period.

This prior period is referred to as the base period and serves to set the benchmark or standard for measuring changes in productive efficiency. The prior period can be any period desired.

For strategic evaluations, the base period is usually chosen as an earlier year. For operational control, the base period tends to be close to the current period—such as the preceding batch of products or the preceding week».

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006

ADVANTAGES OF PARTIAL MEASURES

«Partial measures allow managers to focus on the use of a particular input.

Operating partial measures **have the advantage of being easily interpreted by everyone** within the organization. Consequently, partial operational measures **are easy to use for assessing productivity performance of operating personnel**. Laborers, for instance, can relate to units produced per hour or units produced per pound of material. Thus, partial operational measures provide feedback that operating personnel can relate to and understand—measures that deal with the specific inputs over which they have control.

The ability of operating personnel to understand and relate to the measures increases the likelihood that the measures will be accepted.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006

DISADVANTAGES OF PARTIAL MEASURES

Partial measures, used in isolation, can be misleading.

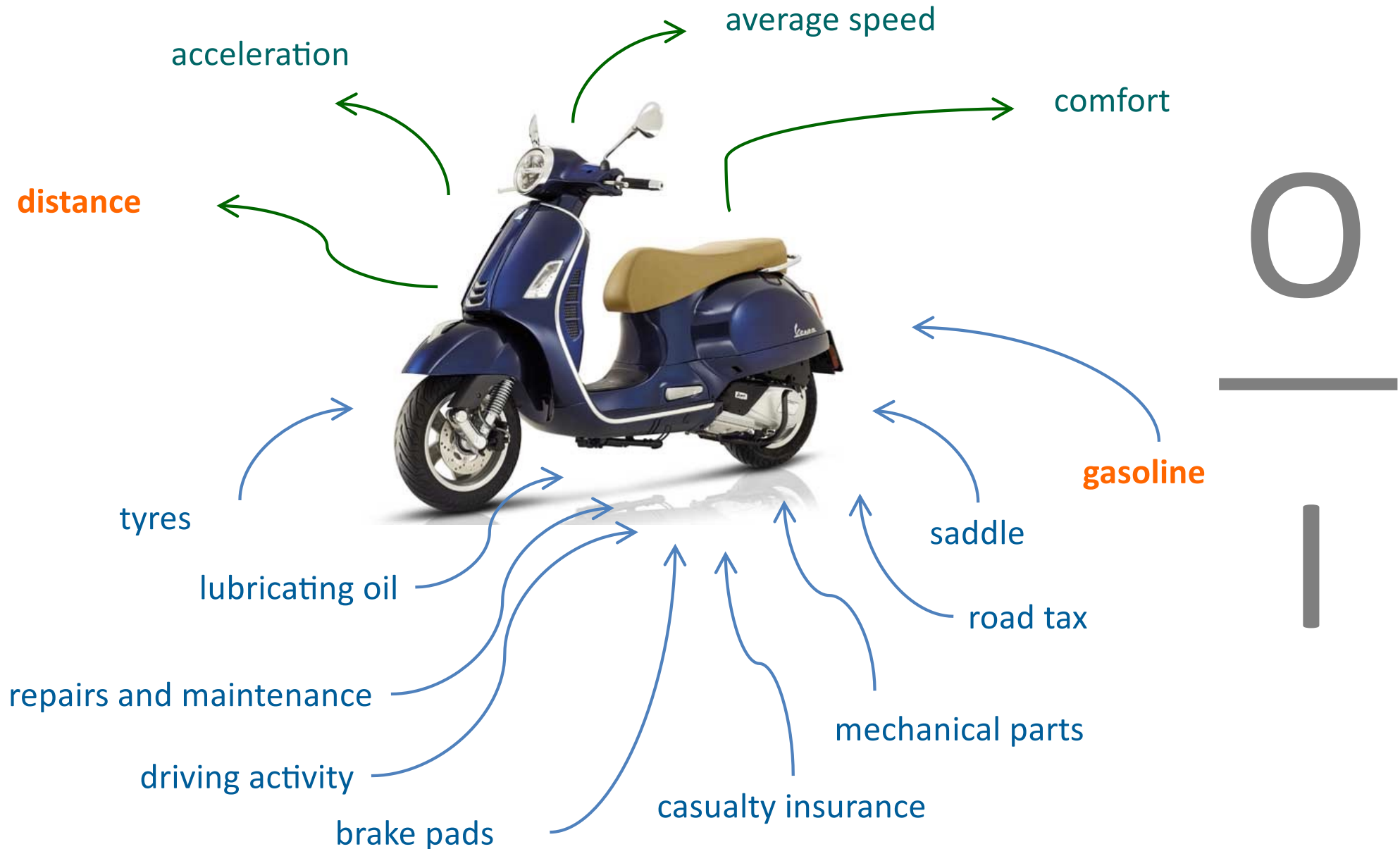
A decline in the productivity of one input may be necessary to increase the productivity of another. Such a trade-off is desirable if overall costs decline, but the effect would be missed by using either partial measure.

For example, changing a process so that direct laborers take less time to assemble a product may increase scrap and waste while leaving total output unchanged. Labor productivity has increased, but productive use of materials has declined. If the increase in the cost of waste and scrap outweighs the savings of the decreased labor, then overall productivity has declined.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



DIFFERENT INPUTS AND DIFFERENT OUTPUTS



SOME CONSEQUENCES

Two important conclusions can be drawn from the analysis of disadvantages of partial productivity measures.

First, the possible existence of trade-offs mandates a total measure of productivity for assessing the merits of productivity decisions. Only by looking at the total productivity effect of all inputs can managers accurately draw any conclusions about overall productivity performance.

Second, because of the possibility of trade-offs, a total measure of productivity must assess the aggregate financial consequences and, therefore, should be a financial measure.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



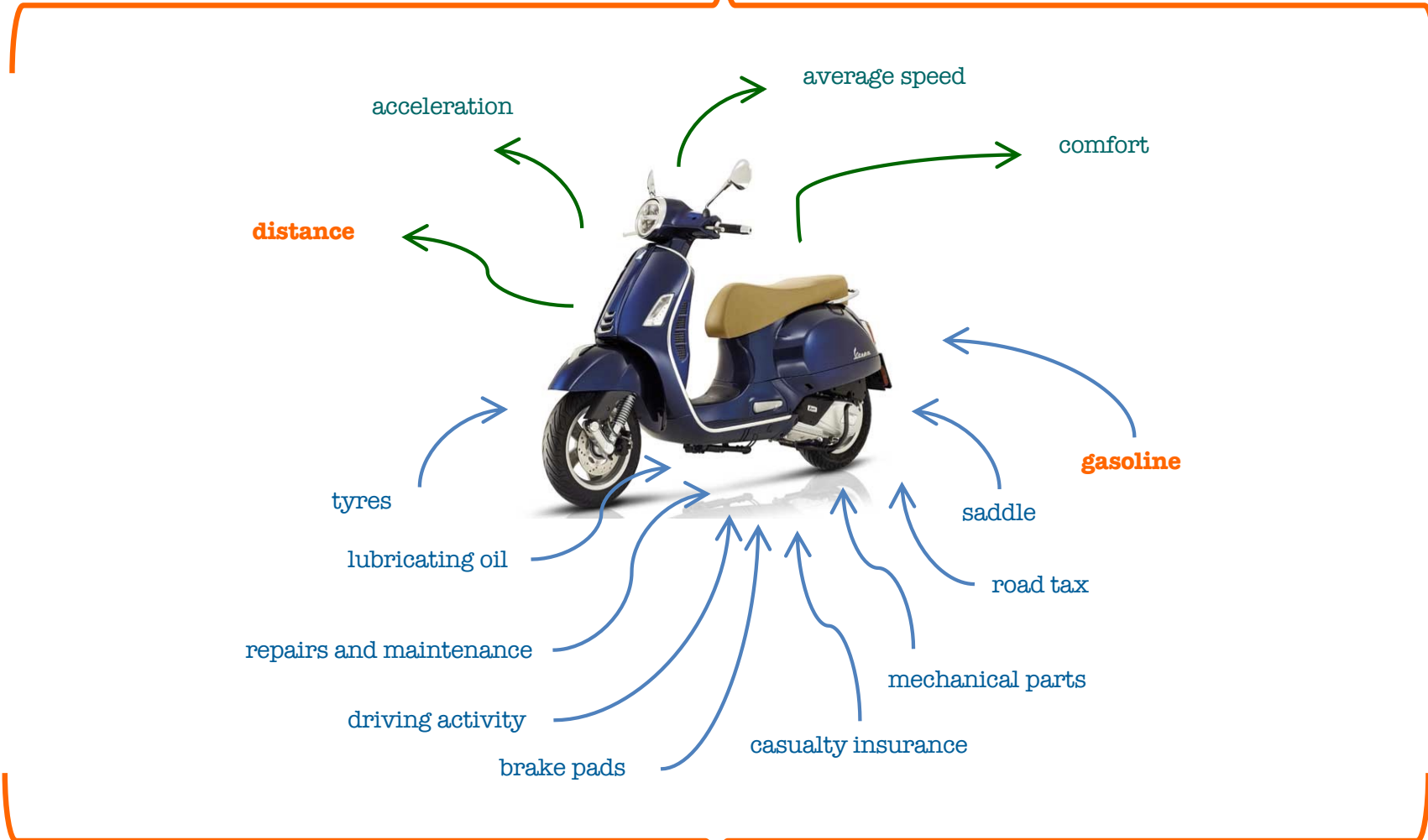
WHY IT IS DIFFICULT TO COMPUTE....

Total operational productivity measure:

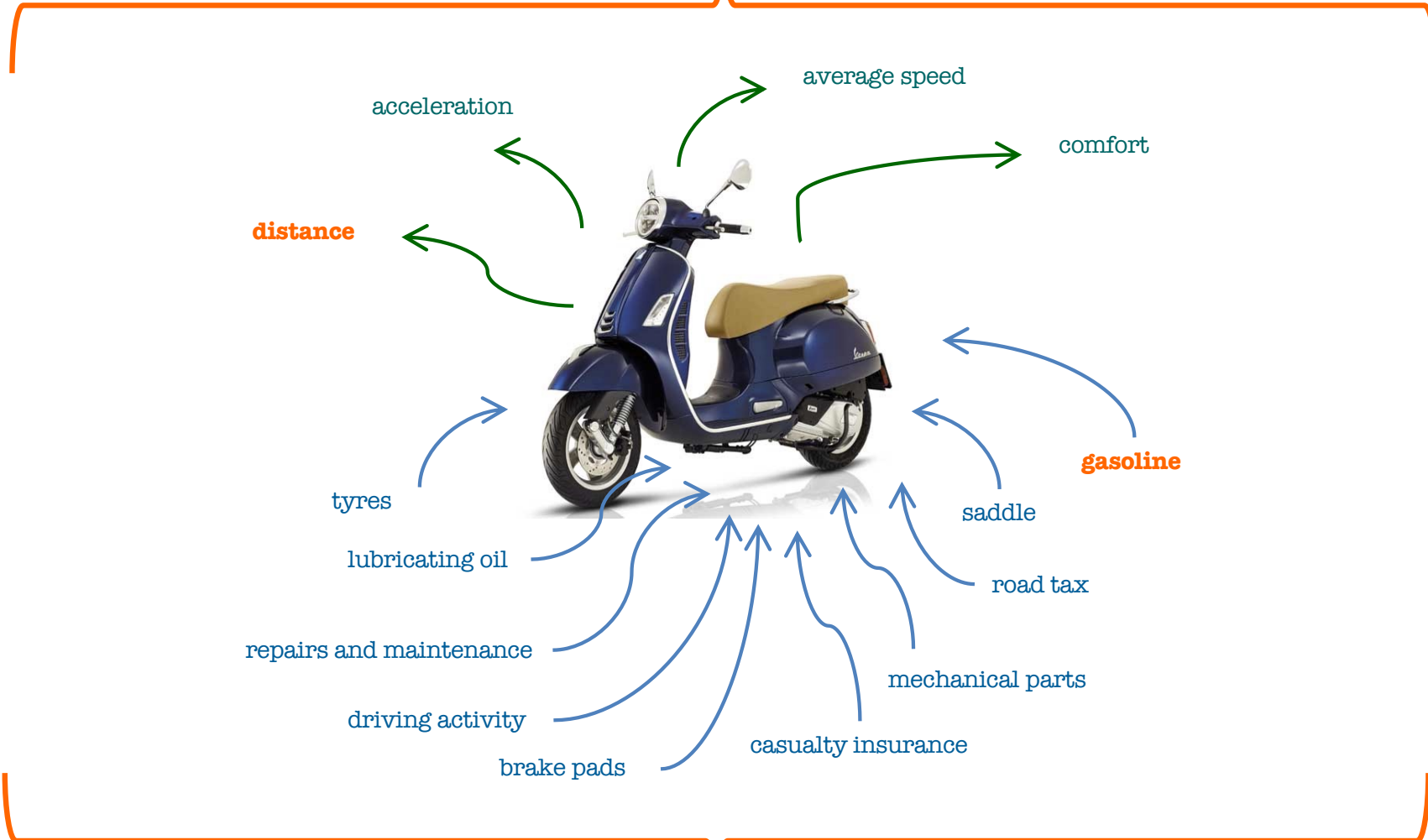
$$\frac{\sum_{j=1}^n O_j^{\text{Ph}}}{\sum_{i=1}^m I_i^{\text{Ph}}}$$

There is a problem of heterogeneity both in the components of the numerator and in those that make up the denominator.

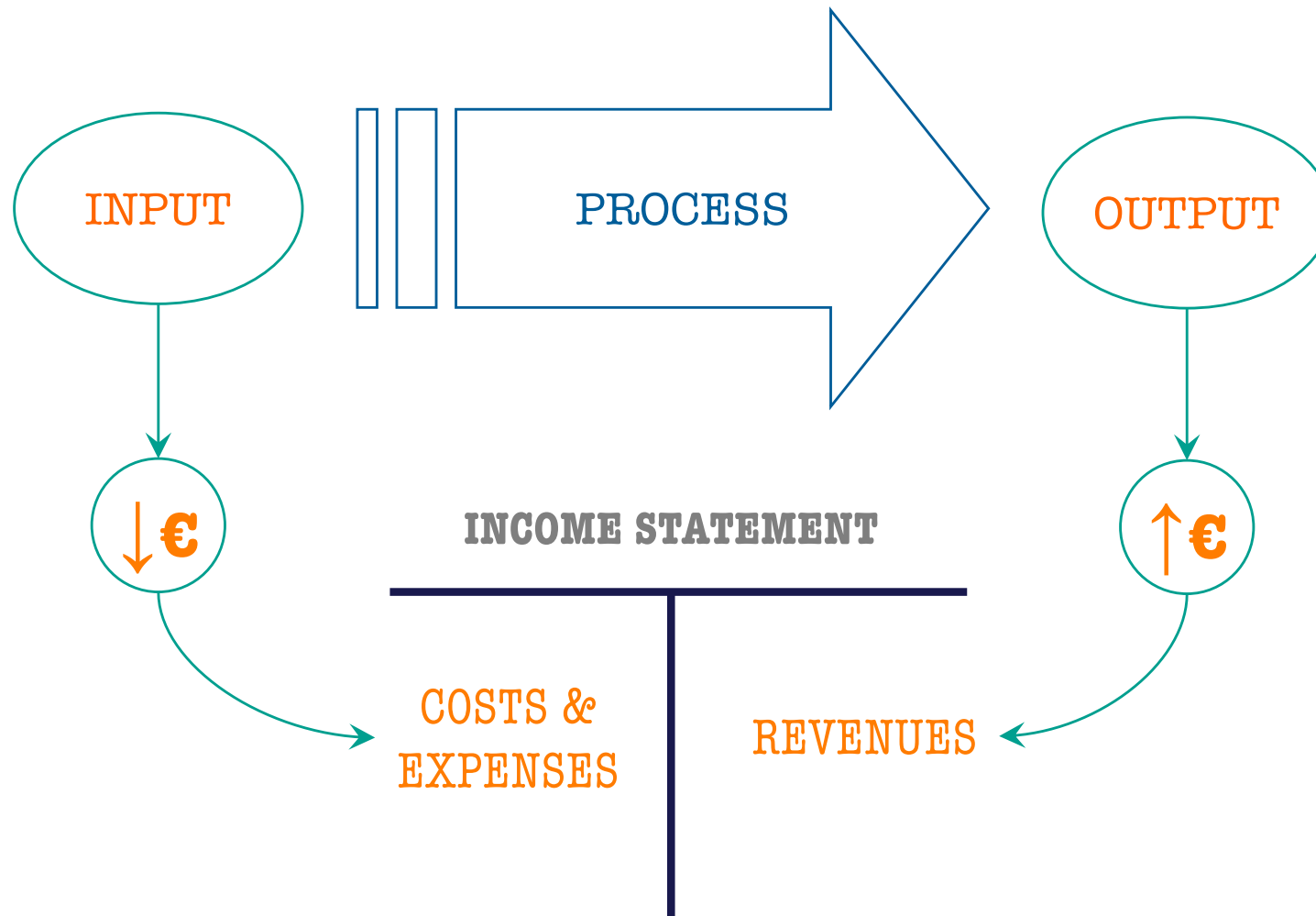
FINACIAL PRODUCTIVITY



FINACIAL PRODUCTIVITY



INCOME STATEMENT



EFFICIENCY

**1. OPERATIONAL
PRODUCTIVITY**

$$\frac{O_{\text{PHYSICAL}}}{I_{\text{PHYSICAL}}}$$

**2. FINANCIAL
PRODUCTIVITY**

$$\frac{O_{\text{REVENUES}}}{I_{\text{EXPENSES}}}$$

3. ...

4. ...



DIFFERENT TYPES OF METRICS

OPERATIONAL
PRODUCTIVITY

$$\frac{O_{Ph}}{I_{Ph}}$$

FINANCIAL
PRODUCTIVITY

$$\frac{O_{\$}}{I_{\$}}$$

$$O_{\$} - I_{\$}$$

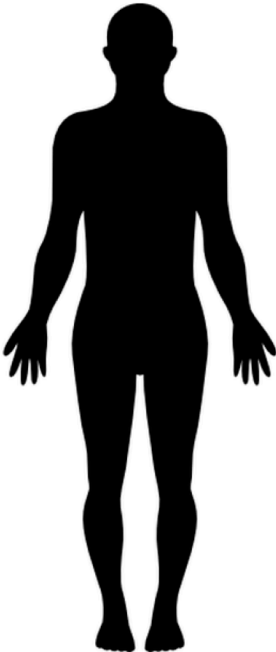
PROFIT: NET PROFIT AND OTHER PROFIT MARGINS

Net Profit (also called “Net Income” or “Net Earnings”) is the “bottom line” of the “Income Statement”. It is therefore computed as revenues, less cost of goods sold less, less other expenses, less taxes.

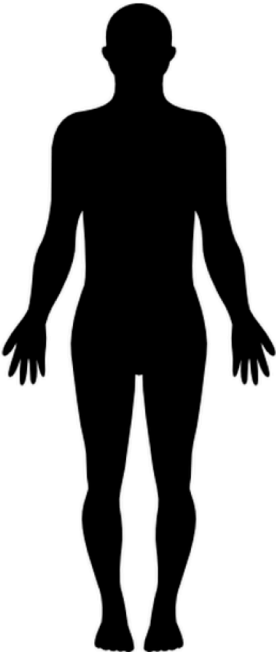
More broadly, **profit** is the difference between revenues and expenses. It can be assessed in a number of different ways because the appropriate measure depends on the specific question being asked. One can, therefore, determine different figures of profit (normally defined as “**margins**”) taking into consideration different subset of revenues and costs or expenses, earned or incurred within a defined time frame.



WHICH OF THE TWO IS IN BETTER SHAPE?



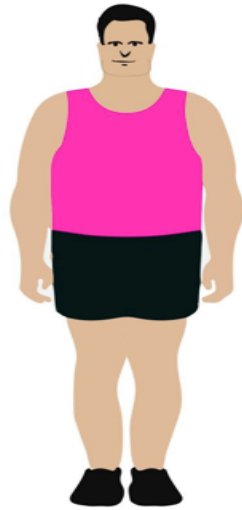
148 lbs.



204 lbs.



MAKING COMPARISONS - BODY MASS INDEX



148 lbs. - 147 cm

67 kg - 4' 10"

BM: 30.9



204 lbs. - 193 cm

93 kg - 6' 4"

BM: 24.8

PROFITABILITY

PROFITABILITY

1. the ability, attitude, potentiality of a business or an activity to yield profit or, more broadly, to offer an adequate level of return
2. a relative number (a percentage) that gauge the level of profitability (in the sense specified above) and is normally expresses as the ratio between profit and another monetary term



PROFIT AND PROFITABILITY

Profitability is a measure of profit compared to another “entity” (“sales”, “assets”, “capital employed”, etc.) and it is therefore expressed in **relative terms**. This way of computing it, enhance the level of **comparability** of the measure considered.

Profitability ratios gauge a company’s profitability—its profits as a percentage of various other numbers. They’ll help you determine whether your company’s profits are healthy or anaemic, and whether they’re moving in the right direction. Examples of profitability ratios are *return on sales*, *contribution margin ratio*, *return on assets*, *return on inventory*, *return on equity*.



DIFFERENT TYPES OF METRICS

OPERATIONAL
PRODUCTIVITY

$$\frac{O_{Ph}}{I_{Ph}}$$

FINANCIAL
PRODUCTIVITY

$$\frac{O_{\$}}{I_{\$}}$$

$$O_{\$} - I_{\$}$$

$$\frac{O_{\$} - I_{\$}}{I_{\$}}$$

$$\frac{O_{\$} - I_{\$}}{O_{\$}}$$

RELATIONSHIP BETWEEN MARK-UP AND ROS

$$\frac{O_{\$} - I_{\$}}{I_{\$}} = x$$

$$\frac{O_{\$} - I_{\$}}{O_{\$}} = ?$$

$$\frac{O_{\$} - I_{\$}}{O_{\$}} = y$$

$$\frac{O_{\$} - I_{\$}}{I_{\$}} = ?$$

FROM MARK-UP TO RETURN ON SALES

$$\frac{O_{\$} - I_{\$}}{I_{\$}} = x \quad \frac{O_{\$} - I_{\$}}{O_{\$}} = ? \quad \Rightarrow$$

$$O_{\$} - I_{\$} = x * I_{\$} \quad \Rightarrow \quad O_{\$} = I_{\$} + x * I_{\$} = I_{\$} * (1+x)$$

$$\frac{O_{\$} - I_{\$}}{O_{\$}} = \frac{x * I_{\$}}{I_{\$} * (1+x)} = \frac{x}{(1+x)}$$

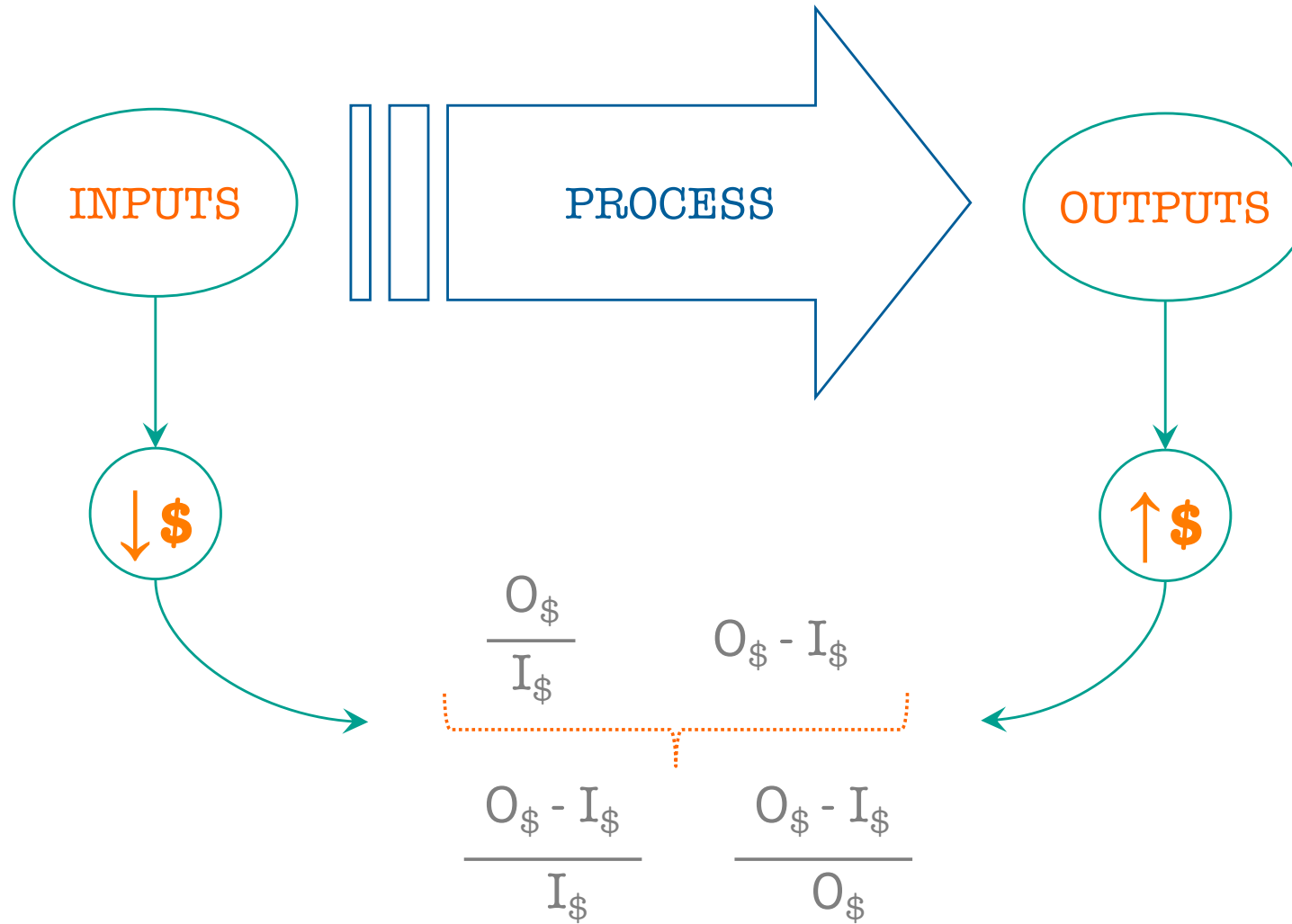
... AND VICE VERSA

$$\frac{O_{\$} - I_{\$}}{O_{\$}} = y \quad \frac{O_{\$} - I_{\$}}{I_{\$}} = ? \quad \Rightarrow$$

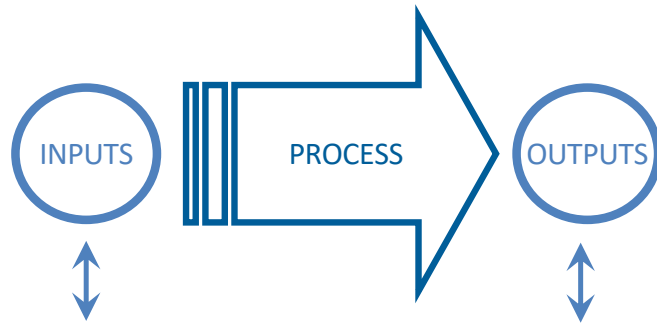
$$O_{\$} - I_{\$} = y * O_{\$} \quad \Rightarrow \quad I_{\$} = O_{\$} - y * O_{\$} = O_{\$} * (1-y)$$

$$\frac{O_{\$} - I_{\$}}{O_{\$}} = \frac{y * O_{\$}}{O_{\$} * (1-y)} = \frac{y}{(1-y)}$$

FINANCIAL PRODUCTIVITY



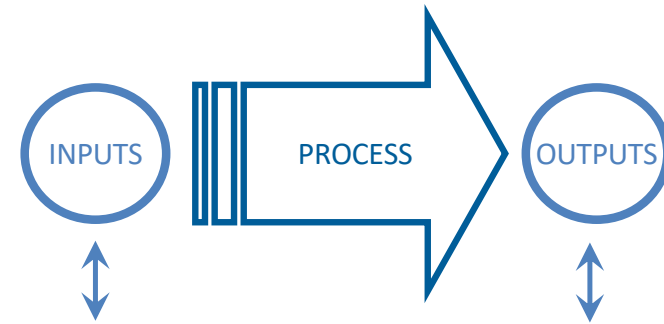
TWO DIFFERENT PERSPECTIVE



Total level of resources
(productive factors)
consumed to achieve
the entire production
(total output)

Total output made in
the period

- + Sales Revenues
- + Changes in Inventory
- + Capitalized Expenses
- = Total Outputs**
- Materials Expenses
- Personnel Expenses
- Expenses for External Services
- Depreciation & Amortization
- = EBIT**



Cost of the goods sold:
portion of the resources
consumed to obtain the
fraction of production that
was sold

Output sold in the
period

- + Sales Revenues
- Cost of Goods Sold
- = Gross Margin**
- Selling, General & Administrative Expenses
- = EBIT**

LINDE INCOME STATEMENT 2000

Linde Group Income Statement in € '000

	Note	2000	1999
Sales	13	8,450,279	6,193,923
Changes in inventories and own work capitalised	14	418,357	65,642
Total output		8,868,636	6,259,565
Other operating income	15	274,078	187,262
Material expense	16	- 3,986,321	- 3,039,673
Personnel expense	17	- 2,222,890	- 1,657,814
Depreciation on tangible and intangible assets	18	- 676,834	- 315,128
Other operating expense	19	- 1,544,010	- 973,147
Investment income	20	7,020	6,933
Depreciation on financial assets and investment securities	18	- 111	- 1,072
Net interest income	21	- 193,518	- 26,506
Profit on ordinary activities		526,050	440,420
Taxes on profit		- 207,117	- 156,324
Other taxes		- 44,556	- 23,374
Net income	22	274,377	260,722

LINDE INCOME STATEMENT 2001

	Note	2001	2000
Sales	11	9,076,395	8,450,279
Cost of sales		- 6,168,579	- 5,617,514
Gross profit on sales		2,907,816	2,832,765
Marketing and selling expenses		- 1,283,712	- 1,270,228
Research and development costs		- 168,335	- 170,994
Administration expenses		- 683,587	- 689,465
Other operating income	12	237,438	274,078
Other operating expenses	13	- 214,652	- 201,378
Amortization of goodwill		- 107,943	- 106,675
Operating profit		687,025	668,103
Net income from investment in other companies		7,692	7,020
Net interest expense		- 187,558	- 193,518
Depreciation of financial assets and investment securities		- 1,708	- 111
Financial result	14	- 181,574	- 186,609
Earnings before taxes on income		505,451	481,494
Taxes on income		- 216,690	- 207,117
Net income		288,761	274,377



BACK TO BASIC FINANCIAL ACCOUNTING

XYZ incurs the following classes of costs during fiscal year 20X0:

	Manufacturing	Other Phases
Materials Expenses	\$ 200,000	\$ 80,000
Personnel Expenses	\$ 350,000	\$ 420,000
Expenses for External Services	\$ 160,000	\$ 450,000
Depreciation & Amortization	\$ 290,000	\$ 550,000
Total	\$ 1,000,000	\$ 1,500,000

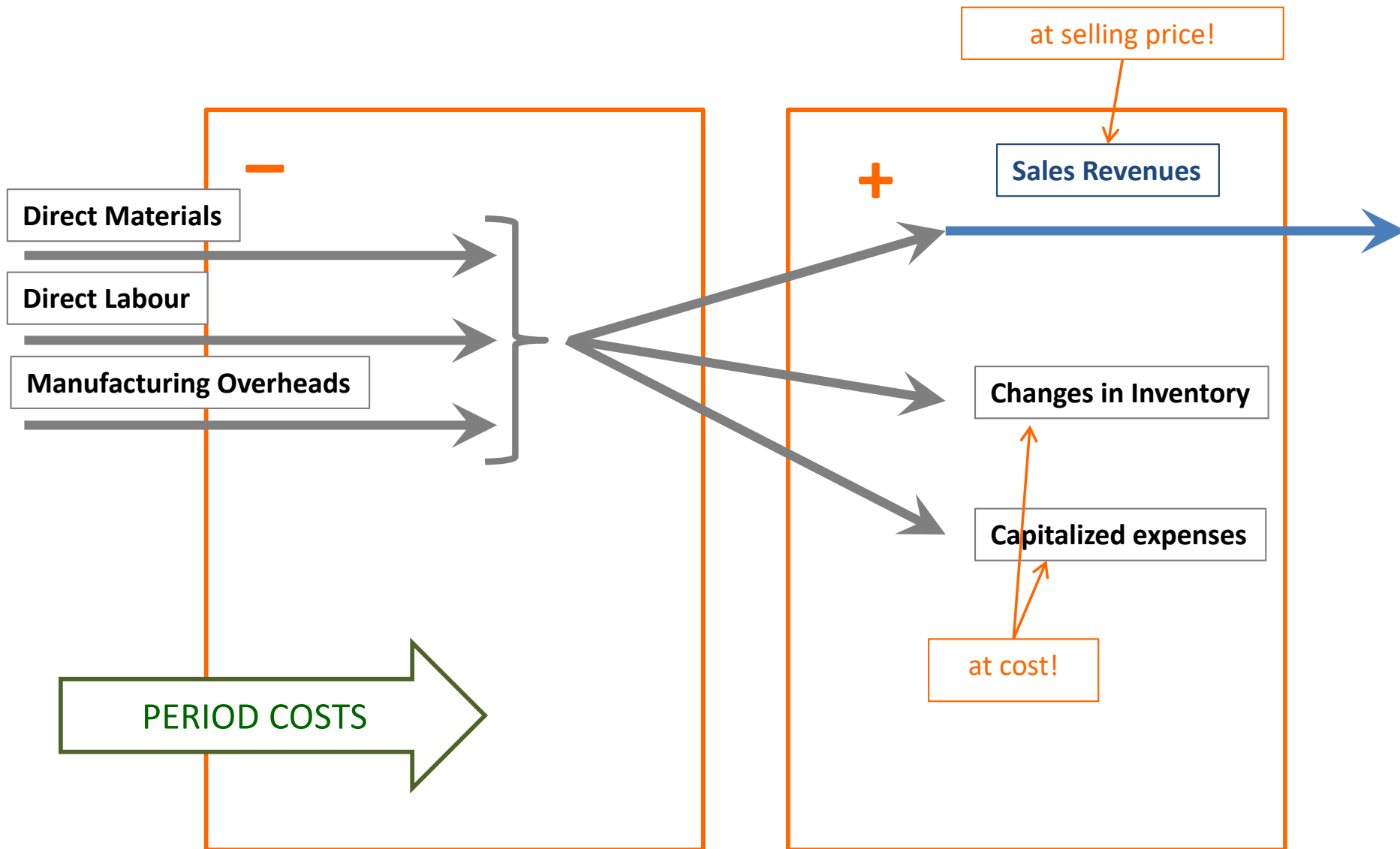
In addition to the typical product, a specific machine is built during the period for use in subsequent fiscal years. Its cost value (all made up of cost-line items belonging to manufacturing costs) is \$ 320,000.

The finished products manufactured during the period are 20,000. Of these the units sold are, instead, 17,600. The average selling price was \$ 130.00.

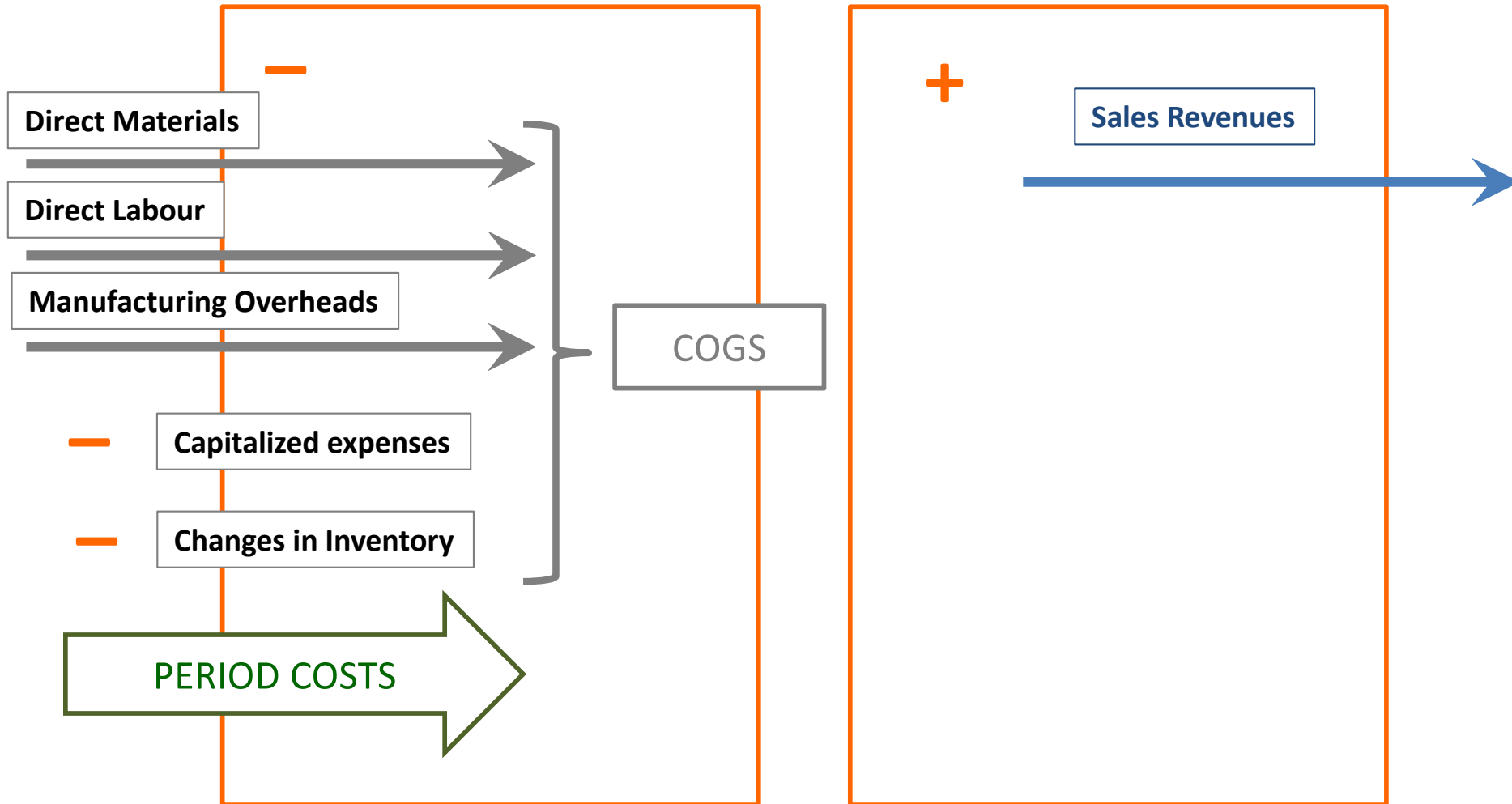
Required: determine the EBIT of the Company



TOTAL OUTPUT INCOME STATEMENT



COGS INCOME STATEMENT



BACK TO BASIC FINANCIAL ACCOUNTING

XYZ incurs the following classes of costs during fiscal year 20X0:

	Manufacturing	Other Phases
Materials Expenses	\$ 200,000	\$ 80,000
Personnel Expenses	\$ 350,000	\$ 420,000
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The finished products manufactured during the period are 20,000. Of these the units sold are, instead, 17,600. The average selling price was \$ 130.00.

Required: determine the EBIT of the Company

+ Sales Revenues	\$ 2,288,000
+ Changes in Inventory	\$ 81,600
+ Capitalized Expenses	\$ 320,000
= Total Outputs	\$ 2,689,600
- Materials Expenses	\$ 280,000
- Personnel Expenses	\$ 770,000
- Expenses for External Services	\$ 610,000
- Depreciation & Amortization	\$ 840,000
= EBIT	\$ 189,600

+ Sales Revenues	\$ 2,288,000
- Cost of Goods Sold	\$ 598,400
= Gross Margin	\$ 1,689,600
- Selling, General & Administrative Expenses	\$ 1,500,000
= EBIT	\$ 189,600



SOME CONSEQUENCES

Measuring productivity for all inputs at once is called total productivity measurement.

In practice, it may not be necessary to measure the effect of all inputs. Many firms measure the productivity of only those factors that are thought to be relevant indicators of organizational performance and success. Thus, in practical terms, total productivity measurement can be defined as focusing on a limited number of inputs, which, in total, indicates organizational success. In either case, total productivity measurement requires the development of a multifactor measurement approach.

Two approaches that have gained some acceptance are profile measurement and profit-linked productivity measurement.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



PROFIT-LINKED PRODUCTIVITY MEASUREMENT

Assessing the effects of productivity changes on current profits is one way to value productivity changes. Profits change from the base period to the current period. Some of that profit change is attributable to productivity changes.

Measuring the amount of profit change attributable to productivity change is defined as profit-linked productivity measurement.

Assessing the effect of productivity changes on current-period profits will help managers understand the economic importance of productivity changes.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



PROFIT-LINKAGE RULE

Linking productivity changes to profits is described by the following rule:

For the current period, calculate the cost of the inputs that would have been used in the absence of any productivity change and compare this cost with the cost of the inputs actually used.

The difference in costs is the amount by which profits changed because of productivity changes.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



APPLYING THE PROFIT-LINKAGE RULE

To apply the linkage rule, the inputs that would have been used for the current period in the absence of a productivity change must be calculated. Let PQ represent this productivity-neutral quantity of input.

To determine the productivity-neutral quantity for a particular input, divide the current-period output by the input's base-period productivity ratio:

$$PQ = \frac{\text{Actual Output}}{\left(\frac{\text{Output}}{\text{Input}} \right)_{\text{Base Period}}}$$

Source: Don R. Hansen & Maryanne M. Mowen, "Cost Management. Accounting and Control", Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



PRICE-RECOVERY COMPONENT

The profit-linked measure computes the amount of profit change from the base period to the current period attributable to productivity changes. Generally, this will not be equal to the total profit change between the two periods.

The difference between the total profit change and the profit-linked productivity change is called the price-recovery component. This component is the change in revenue less a change in the cost of inputs, assuming no productivity changes. It, therefore, measures the ability of revenue changes to cover changes in the cost of inputs, assuming no productivity change.

Source: Don R. Hansen & Maryanne M. Mowen, “Cost Management. Accounting and Control”, Fifth Edition, Chapter 15 *Productivity Measurement and Control*, Thomson South-Western, 2006



PROFIT-LINKAGE RULE: AN EXAMPLE

	20X0	20X1
Number of frames produced	240'000	250'000
Labor hours used	60'000	50'000
Materials used (lbs.)	1'200'000	1'300'000
Unit selling price (frames)	30.00 US\$	29.00 US\$
Wages per labor hour	15.00 US\$	15.00 US\$
Cost per pound of material	3.00 US\$	3.50 US\$
Operational productivity for labor	4.0000	5.0000
Operational productivity for materials	0.2000	0.1923
Quantity of labor that <i>would have been used</i>		62'500
Quantity of material that <i>would have been used</i>		1'250'000



PRICE RECOVERY EFFECT

Hypothetical cost of labor	62'500	15.00 US\$	937'500 US\$
Hypothetical cost of materials	1'250'000	3.50 US\$	4'375'000 US\$
Hypothetical cost of inputs			5'312'500 US\$

Actual cost of labor	50'000	15.00 US\$	750'000 US\$
Actual cost of materials	1'300'000	3.50 US\$	4'550'000 US\$
Actual cost of inputs			5'300'000 US\$

Productivity gain			187'500 US\$
Productivity loss			-1'75'000 US\$
Profit-linked productivity change			12'500 US\$

	20X0	20X1	- Difference -
Revenues	7'200'000 US\$	7'250'000 US\$	50'000 US\$
Cost of inputs	-4'500'000 US\$	-5'300'000 US\$	-800'000 US\$
Profit	2'700'000 US\$	1'950'000 US\$	-750'000 US\$
- Profit-linked productivity change			-12'500 US\$
Price-recovery effect			-762'500 US\$



PROFIT-LINKAGE RULE: AN EXAMPLE

20X0

Product XYZ	200 €	10,00 €	2.000,00
Resource A	490 €	2,00 €	980,00
Resource B	400 €	1,00 €	400,00
Margin		€	620,00

20X1

Product XYZ	200 €	9,75 €	1.950,00
Resource A	460 €	1,80 €	828,00
Resource B	410 €	1,20 €	492,00
Margin		€	630,00

Required:

- determine the level of the partial operational productivity measures of the two resources over the two years;
- determine the variance in margin



PROFIT-LINKAGE RULE: AN EXAMPLE

20X0

Product XYZ	200	€	10,00	€	2.000,00
Resource A	490	€	2,00	€	980,00
Resource B	400	€	1,00	€	400,00
Margin			(B)	€	620,00

Partial Operational Productivity:

Resource A	0,4082
Resource B	0,5000

20X1

Product XYZ	200	€	9,75	€	1.950,00
Resource A	460	€	1,80	€	828,00
Resource B	410	€	1,20	€	492,00
Margin			(A)	€	630,00

Partial Operational Productivity:

Resource A	0,4348
Resource B	0,4878

$$\text{Variance in margin} = (A) - (B) = \text{€ } 630 - \text{€ } 620 = \mathbf{+ \text{€ } 10}$$

$$\text{Variance in margin} = \mathbf{+ \text{€ } 10} \left\{ \begin{array}{l} \text{Variance in revenues} = + \text{€ } 1,950 - \text{€ } 2,000 = \mathbf{- \text{€ } 50} \\ \text{Variance in costs (res. A)} = - \text{€ } 828 - - \text{€ } 980 = + \text{€ } 980 - \text{€ } 828 = \mathbf{+ \text{€ } 152} \\ \text{Variance in costs (res. B)} = - \text{€ } 492 - - \text{€ } 400 = + \text{€ } 400 - \text{€ } 492 = \mathbf{- \text{€ } 92} \end{array} \right.$$



PROFIT-LINKAGE RULE: AN EXAMPLE

20X0

Product XYZ	200 €	10,00 €	2.000,00
Resource A	490 €	2,00 €	980,00
Resource B	400 €	1,00 €	400,00
Margin		(B) €	620,00

Partial Operational Productivity:

Resource A	0,4082
Resource B	0,5000

20X1

Product XYZ	200 €	9,75 €	1.950,00
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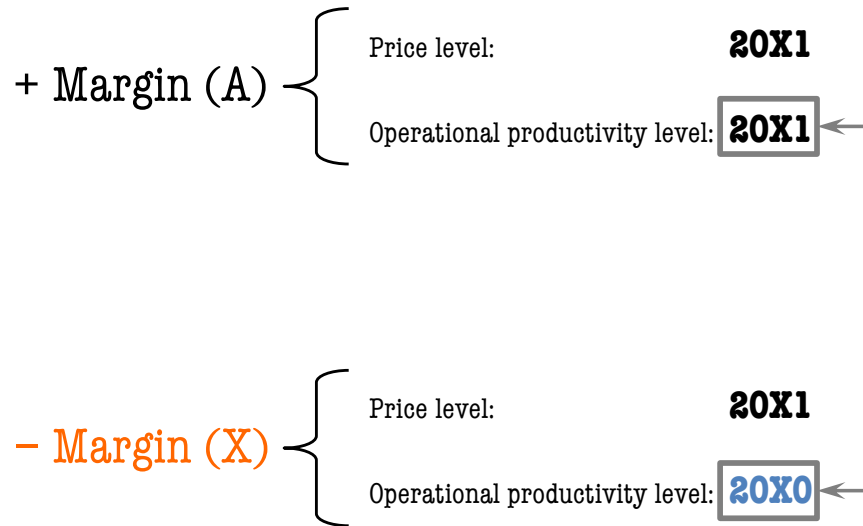
Partial Operational Productivity:

Resource A	0,4348
Resource B	0,4878

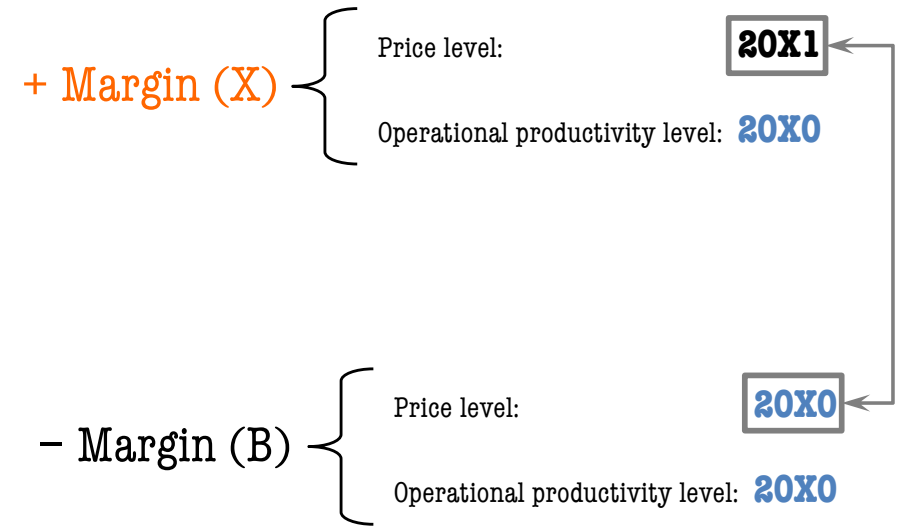
Product XYZ	200 €	9,75 €	1.950,00
Resource A	490 €	1,80 €	882,00
Resource B	400 €	1,20 €	480,00
Margin		(X) €	588,00



TWO COMPONENTS



This component of the overall variance measures the effect of changes in the levels of utilisation of different resources (operational productivity) by valuing this information (logically expressed in physical units) on the basis of the most recent prices.



This second component, on the other hand, values the same level of resource utilisation using two distinct price levels (final and initial) and thus provides a measure of the effect produced on the margin by the change in price level (upstream and downstream of the firm)

PROFIT-LINKAGE RULE: ANOTHER EXAMPLE

20X0

Product XYZ	200 €	10,00 €	2.000,00
Resource A	490 €	2,00 €	980,00
Resource B	400 €	1,00 €	400,00
Margin		(B) €	620,00

Resource A	2,45
Resource B	2,00

20X1

Product XYZ	220 €	9,75 €	2.145,00
Resource A	506 €	1,80 €	910,80
Resource B	451 €	1,20 €	541,20
Margin		(A) €	693,00

Resource A	2,30
Resource B	2,05

$$\text{Variance in the margin} = (A) - (B) = [(A) - (X)] + [(X) - (Y)] + [(Y) - (B)] = + \text{€ } 73$$



PROFIT-LINKAGE RULE: ANOTHER EXAMPLE

$$\text{Variance in the margin} = (A) - (B) = [(A) - (X)] + [(X) - (Y)] + [(Y) - (B)] = + \text{€ } 73$$

Product XYZ	220 €	9,75 €	2.145,00
Resource A	539 €	1,80 €	970,20
Resource B	440 €	1,20 €	528,00
Margin		(X) €	646,80

Product XYZ	220 €	10,00 €	2.200,00
Resource A	539 €	2,00 €	1.078,00
Resource B	440 €	1,00 €	440,00
Margin		(Y) €	682,00



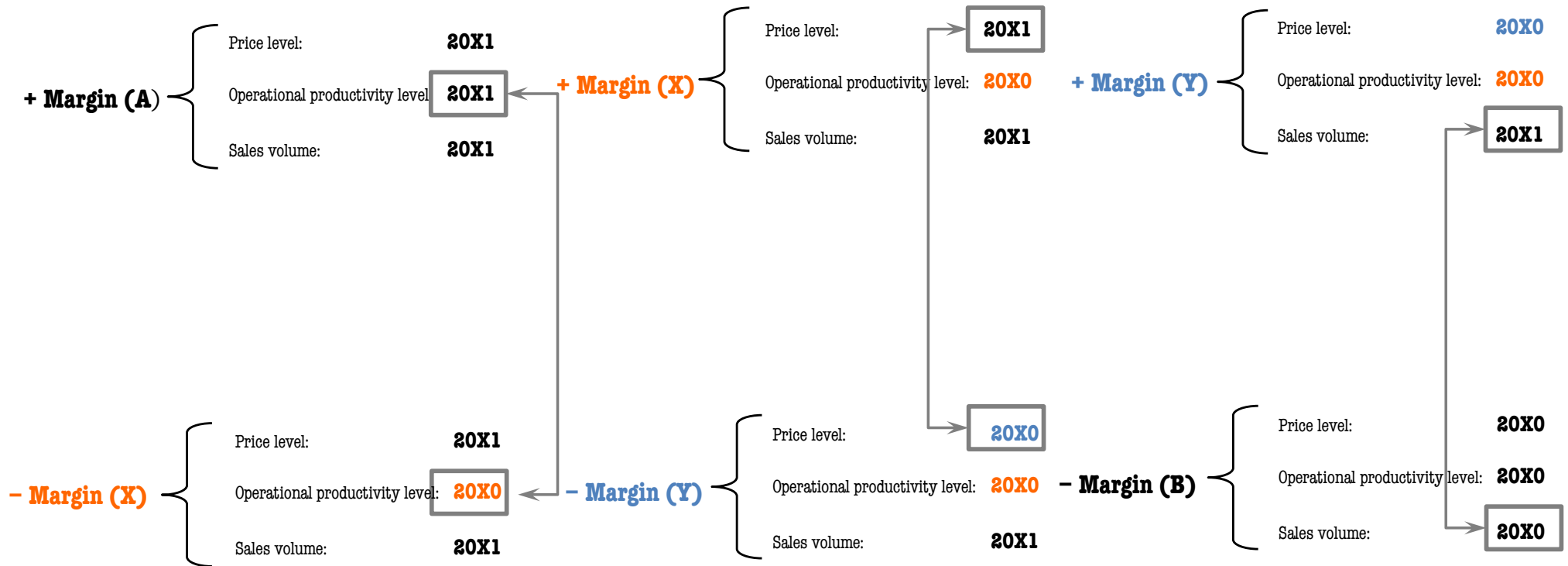
PROFIT-LINKAGE RULE: ANOTHER EXAMPLE

$$\text{Variance in the margin} = (A) - (B) = [(A) - (X)] + [(X) - (Y)] + [(Y) - (B)] = + \text{€ } 73$$

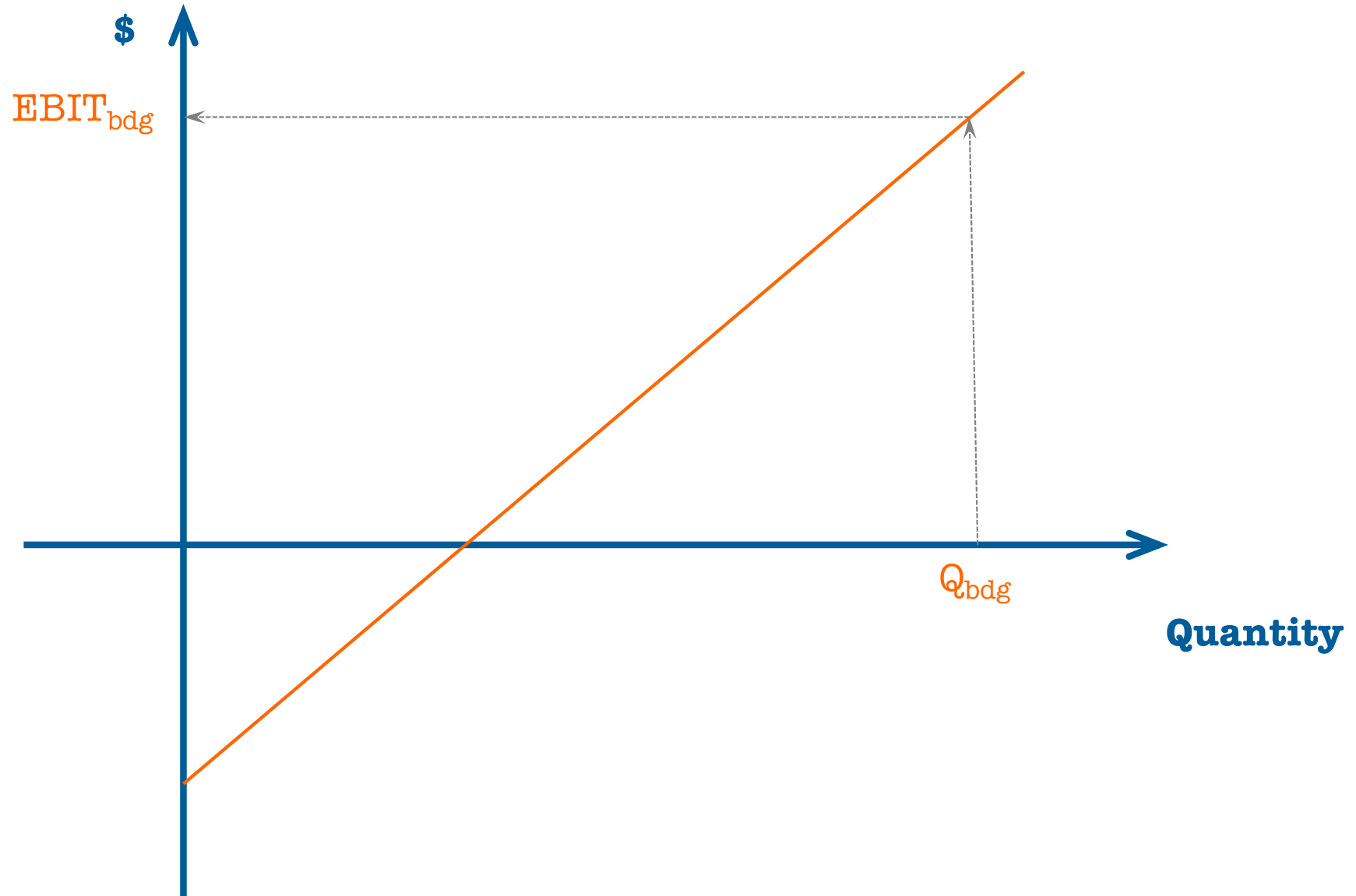
Product XYZ	220 €	9,75 €	2.145,00	+ (A)	€ 693,00
				- (X)	-€ 646,80
				Scostamento efficienza	€ 46,20
Resource A	539 €	1,80 €	970,20		
Resource B	440 €	1,20 €	528,00		
Margin		(X)	€ 646,80	+ (X)	€ 646,80
				- (Y)	-€ 682,00
				Scostamento prezzi	-€ 35,20
				+ (Y)	€ 682,00
				- (B)	-€ 620,00
				Scostamento volume	€ 62,00
Product XYZ	220 €	10,00 €	2.200,00		
Resource A	539 €	2,00 €	1.078,00		
Resource B	440 €	1,00 €	440,00		
Margin		(Y)	€ 682,00	Scostamento efficienza	€ 46,20
				Scostamento prezzi	-€ 35,20
				Scostamento volume	€ 62,00
				Scostamento totale	€ 73,00



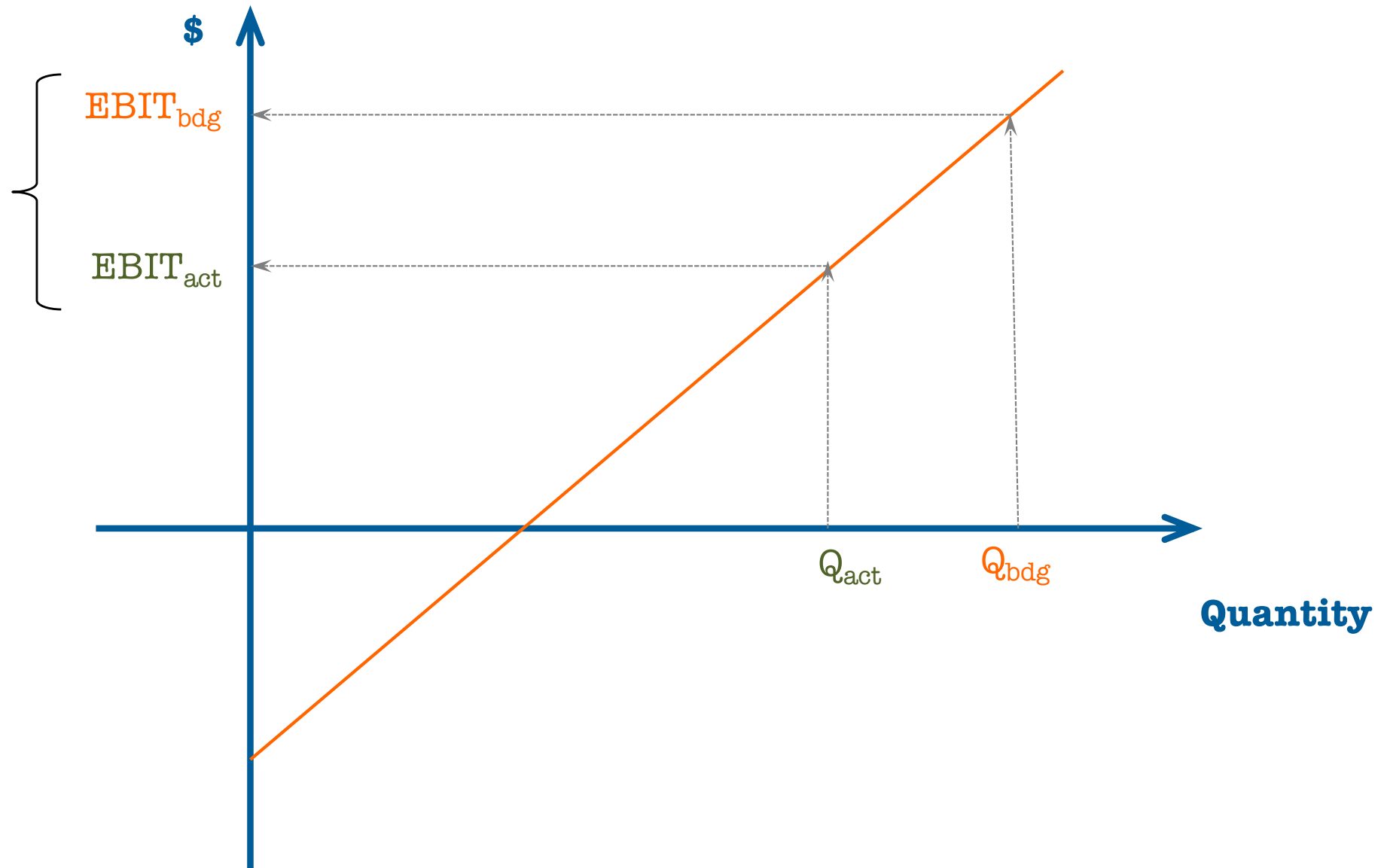
THREE COMPONENTS



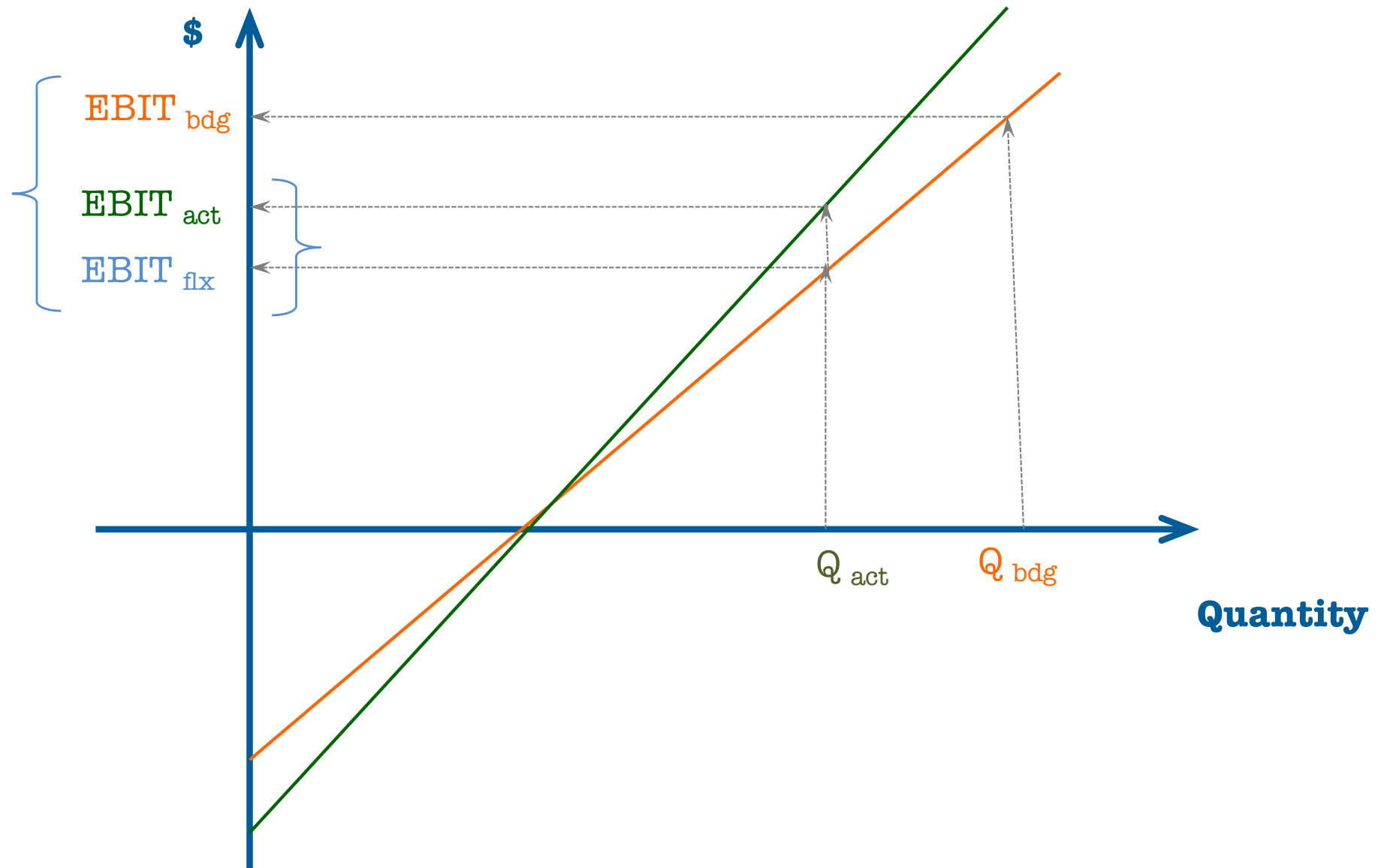
BUDEGT



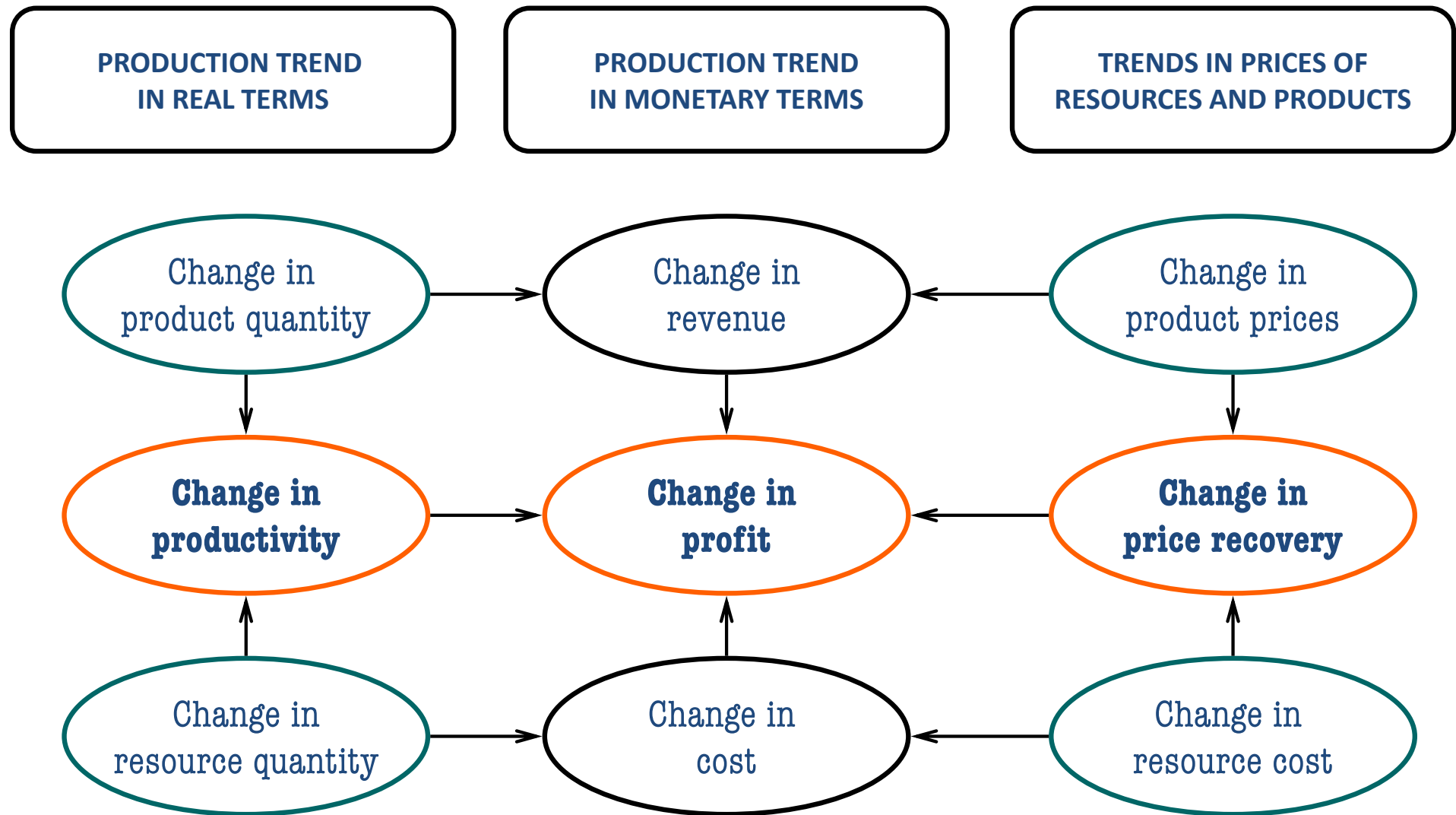
FLEXING THE BUDEGT



AGAIN: TWO COMPONENTS

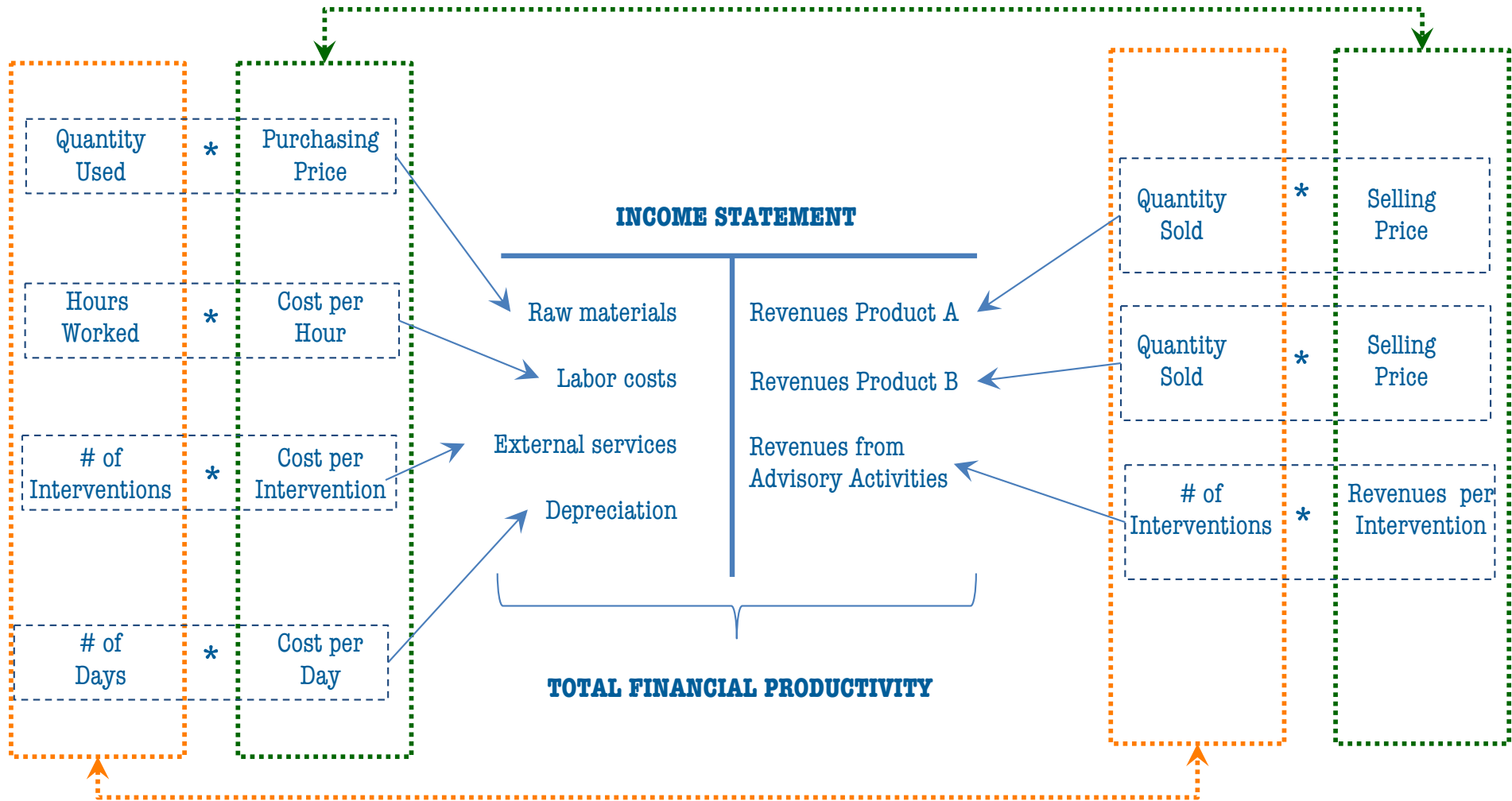


PROFITABILITY = PRODUCTIVITY + PRICE RECOVERY



SOME IMPORTANT RELATIONSHIPS

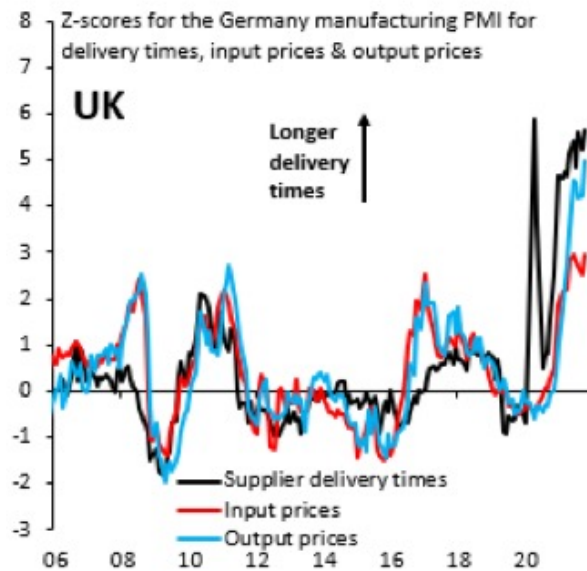
TOTAL PRICE EFFECT



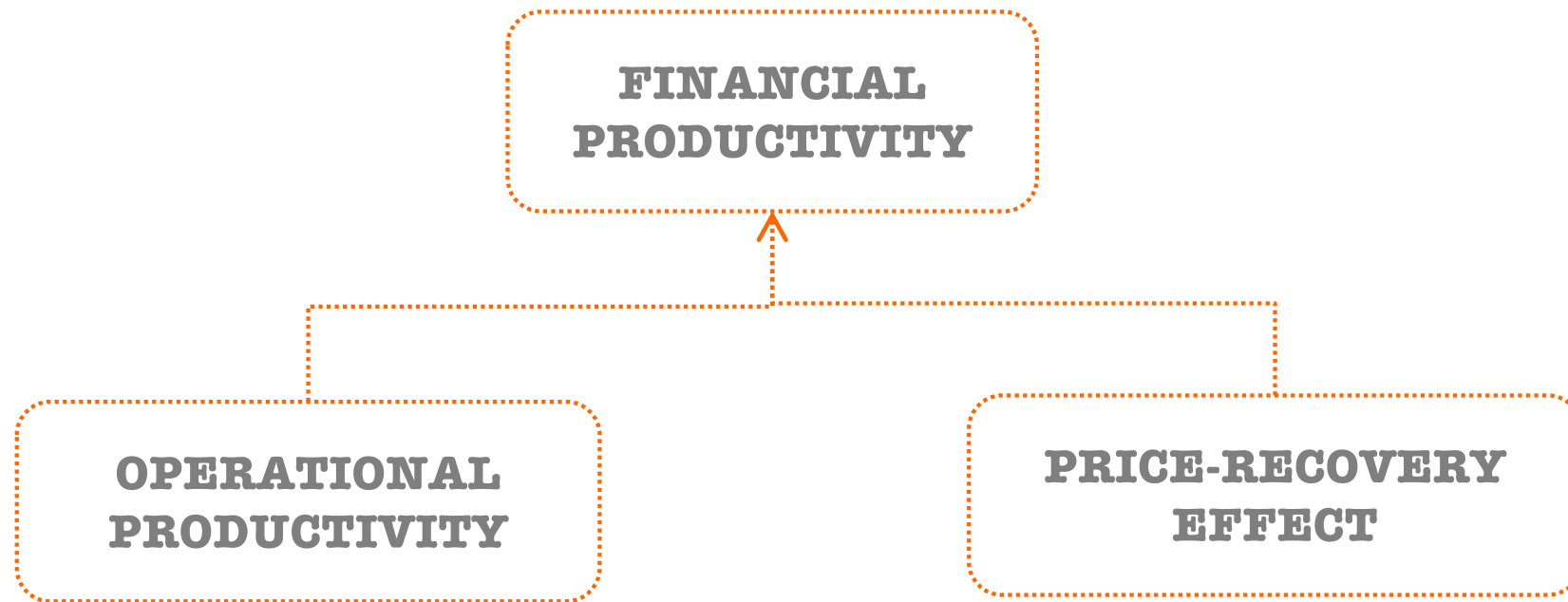
TOTAL OPERATIONAL PRODUCTIVITY



A GLIMPSE AT REAL DATA



CAUSES AND EFFECT



PORTER'S 5 FORCES



DIFFERENT POSSIBLE PROFIT MARGINS

+ Sales revenues	€	265.780	100,00%
- Cost of goods sold (@manufacturing variable cost)	-€	85.330	-32,11%
= Manufacturing variable margin	€	180.450	67,89%
- Sales variable costs	-€	24.550	-9,24%
= Contribution margin	€	155.900	58,66%
- Fixed costs (excluding depreciation and amortization costs)	-€	83.009	-31,23%
= EBITDA	€	72.891	27,43%
- Depreciation and amortization costs	-€	38.126	-14,34%
= EBIT	€	34.765	13,08%
- Interest expenses	-€	12.500	-4,70%
= EBT	€	22.265	8,38%
- Income taxes	-€	6.680	-2,51%
= EAT	€	15.586	5,86%

DIFFERENT PRIORITIES?

	COMPANY "A"	COMPANY "B"
+ TOTAL OUTPUT	100 €	100 €
- INTERMEDIATE CONSUMPTION	(10 €)	(60 €)
<hr/>		
= ADDED VALUE	90 €	40 €
- OTHER OPERATING COSTS	(85 €)	(35 €)
<hr/>		
= EBIT	5 €	5 €



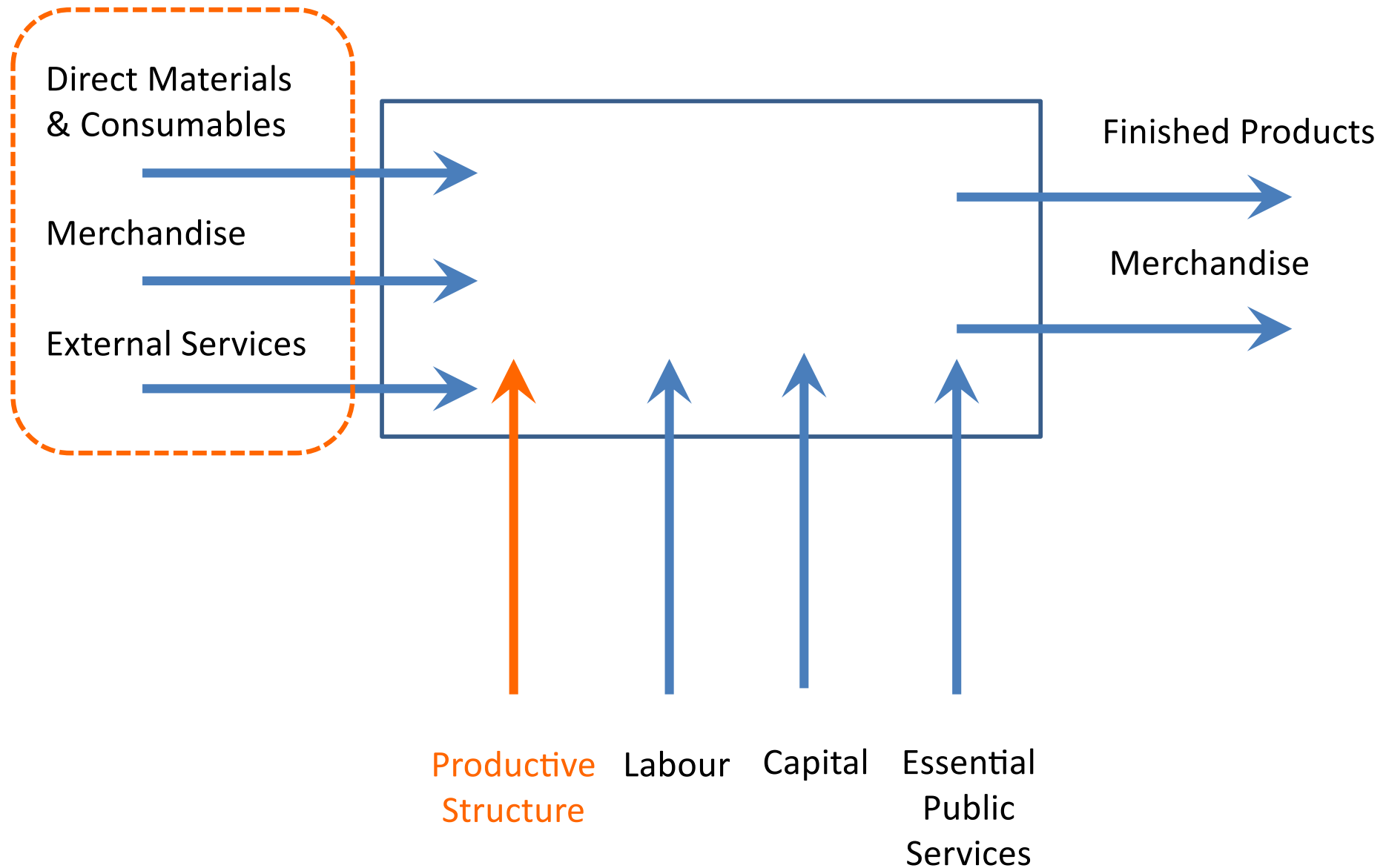
ADDED VALUE

The term **value added** refers to the **contribution** of the **factors of production that are considered “internal”** to a specific entity – i.e. fixed assets (both tangible and intangible), internal labour (work performed by employees), financial capital (both borrowed or obtained as equity capital) and essential public services available to the firm – **to raise the value of goods and services acquired outside** the entity.

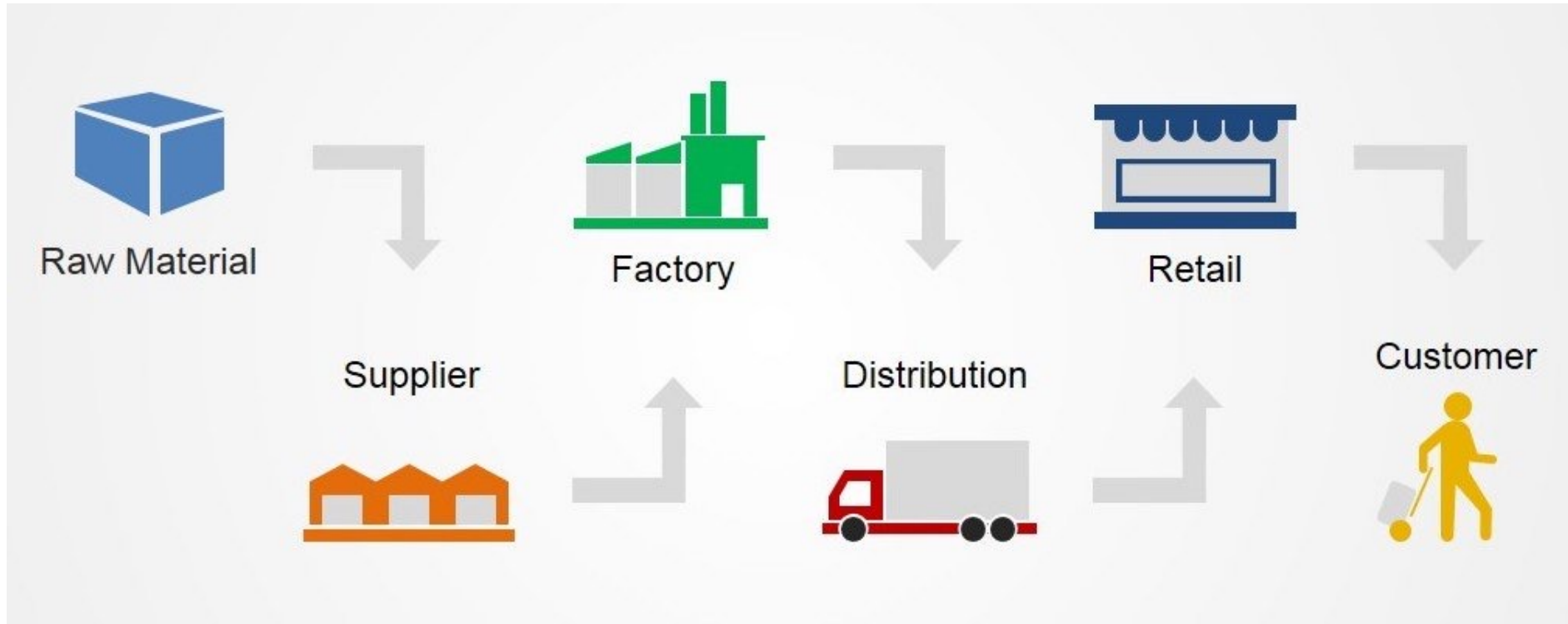
The value thus added is **ideally used to sequentially remunerate all the internal factors of production considered**, in a cascading process in which equity contributors are only rewarded in residual terms (with the possibility that instead of gaining value, they lose it to other parties)



ADDED VALUE

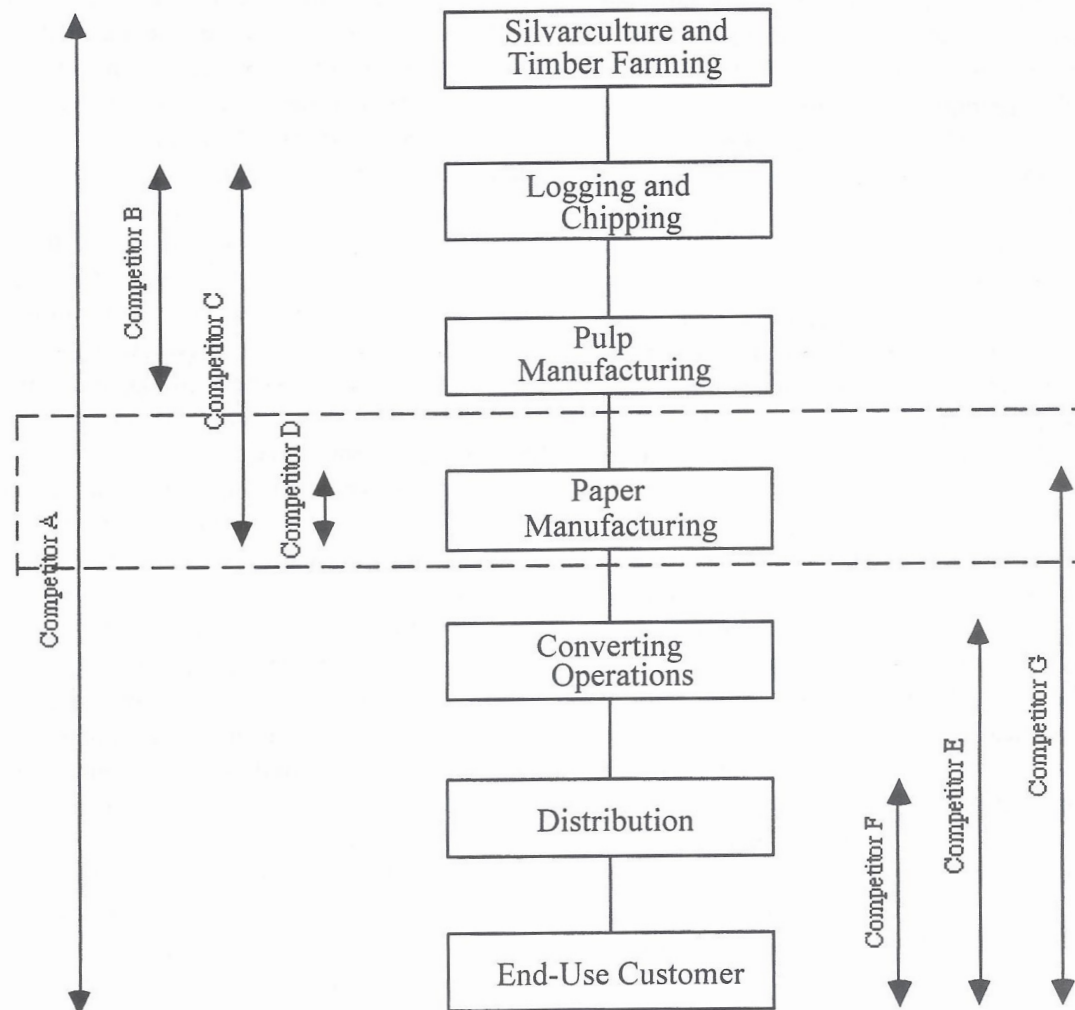


SUPPLY CHAIN



In commerce, a supply chain is a network of facilities that procure raw materials, transform them into intermediate goods and then final products to customers through a distribution system. It refers to the network of organizations, people, activities, information, and resources involved in delivering a product or service to a consumer. Supply chain activities involve the transformation of natural resources, raw materials, and components into a finished product and delivering the same to the end customer.

SUPPLY CHAIN IN THE PAPER PRODUCTS INDUSTRY

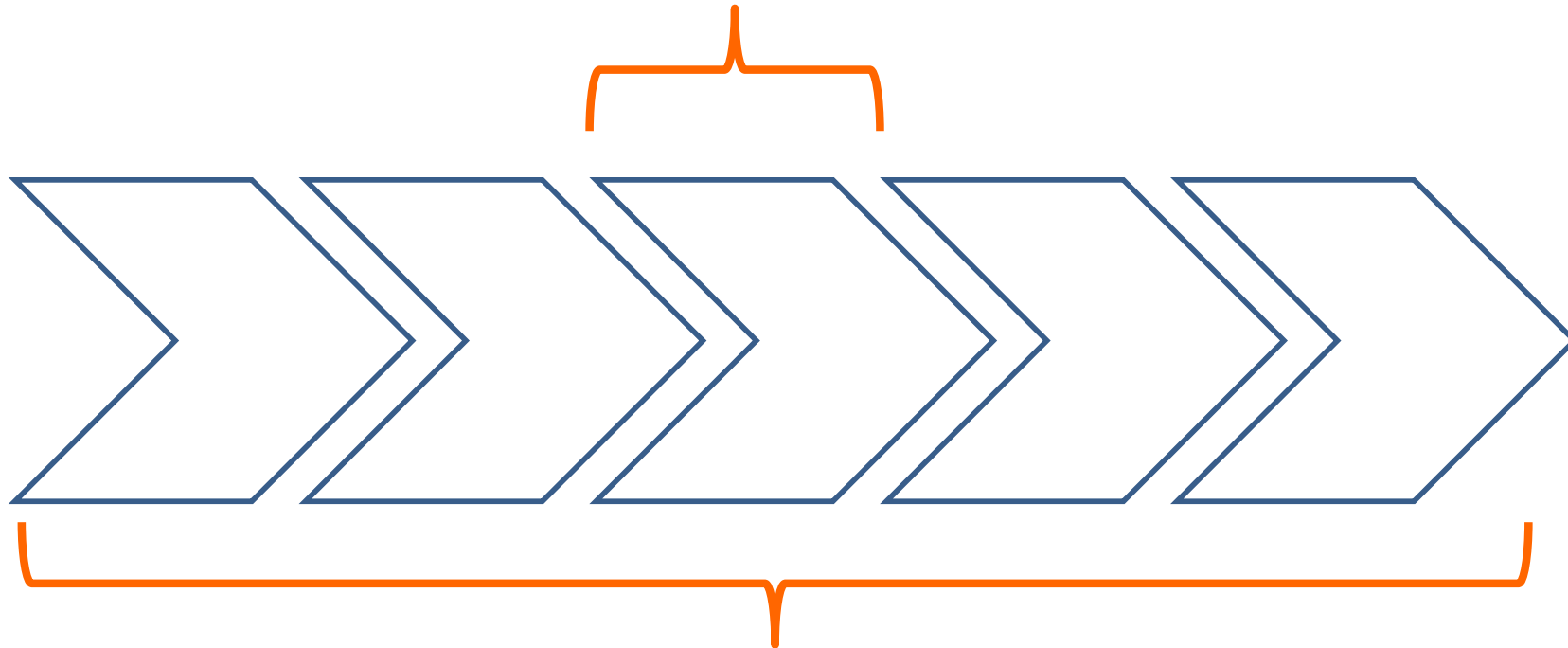


Source: John K. Shank, "Cases in Cost Management. A Strategic Emphasis", Third Edition, Thompson, 2006



DIFFERENT STRATEGIES

Outsourcing is the business practice of hiring a party outside a company to perform services or create goods that were traditionally performed in-house by the company's own employees and staff. Outsourcing is a practice usually undertaken by companies as a cost-cutting measure



A vertical integration is when a **firm extends its operations within its supply chain**. It means that a **vertically integrated company will bring in previously outsourced operations in-house**. The direction of vertical integration can either be upstream (backward) or downstream (forward). This can be achieved either by internally developing an extended production line or by acquiring vertically.

ANY CONNECTION?

	COMPANY "A"	COMPANY "B"
+ TOTAL OUTPUT	100 €	100 €
- INTERMEDIATE CONSUMPTION	(10 €)	(60 €)
<hr/>	<hr/>	<hr/>
= ADDED VALUE	90 €	40 €
- OTHER OPERATING COSTS	(85 €)	(35 €)
<hr/>	<hr/>	<hr/>
= EBIT	5 €	5 €
STRATEGY FOLLOWED:	VERTICAL INTEGRATION	OUTSOURCING



DIFFERENT PRIORITIES?

+ TOTAL OUTPUT

- INTERMEDIATE CONSUMPTION

= ADDED VALUE

- OTHER OPERATING COSTS

= EBIT

PROBABLE PRIORITY OF
CONTROL SYSTEM:

COMPANY "A"

COMPANY "B"

100 €

100 €

(10 €)

(60 €)

90 €

40 €

(85 €)

(35 €)

5 €

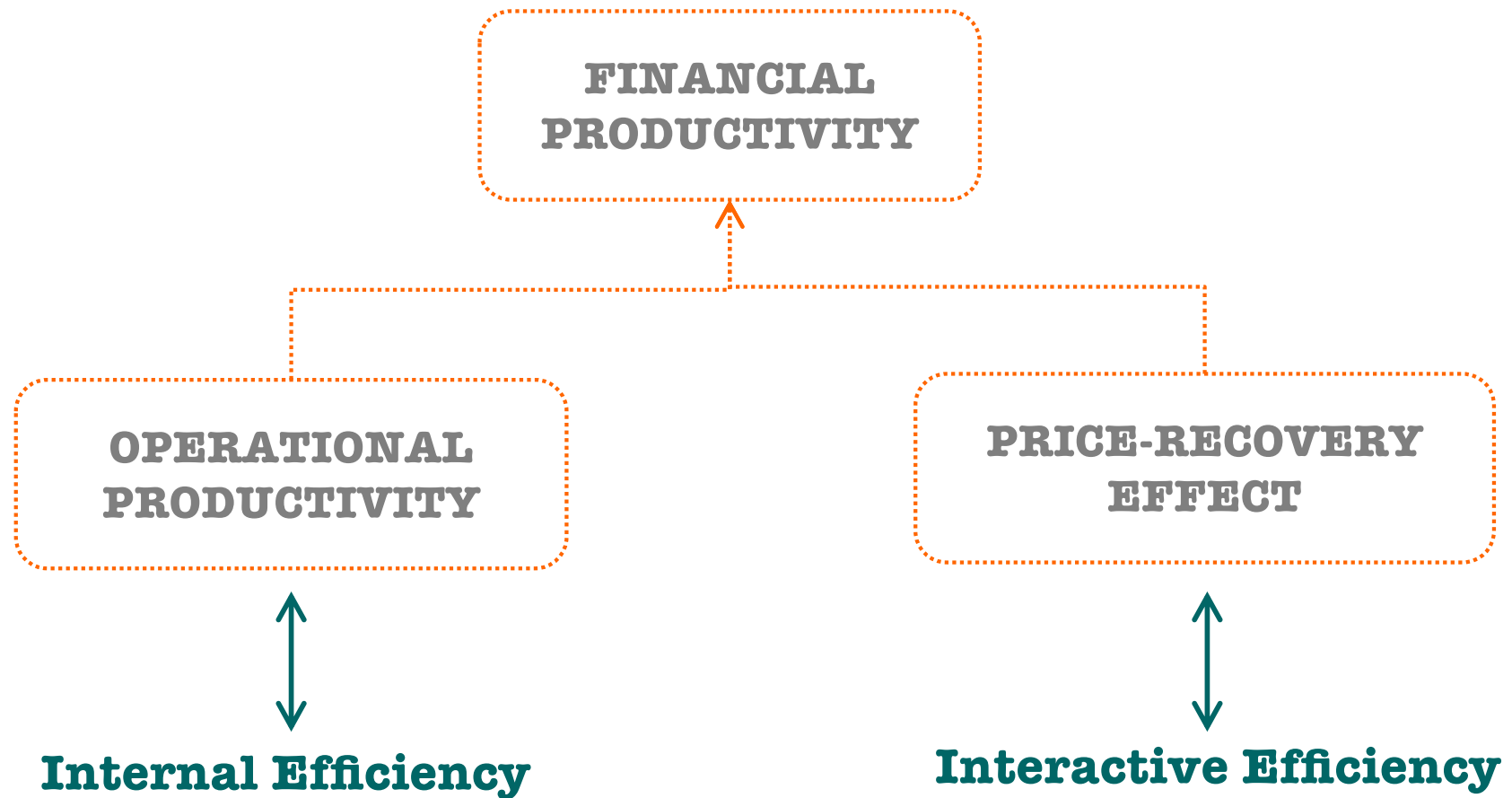
5 €

PRODUCTIVITY

PRICE
RECOVERY



CAUSES AND EFFECT



EFFICIENCY

1. OPERATIONAL PRODUCTIVITY

a) Partial ✓

b) Total ✗

$$\frac{O_{\text{PHYSICAL}}}{I_{\text{PHYSICAL}}}$$

2. FINANCIAL PRODUCTIVITY

a) Partial ✗

b) Total ✓

$$\frac{O_{\text{REVENUES}}}{I_{\text{EXPENSES}}}$$



EFFICIENCY

1. OPERATIONAL PRODUCTIVITY

a) Partial ✓

b) Total ✗

2. FINANCIAL PRODUCTIVITY

a) Partial ✗

b) Total ✓

EFFICIENCY

1. OPERATIONAL PRODUCTIVITY

- a) Partial
- b) Total

$$\frac{O_{\text{PHYSICAL}}}{I_{\text{PHYSICAL}}}$$

2. FINANCIAL PRODUCTIVITY

- a) Partial
- b) Total

$$\frac{O_{\text{REVENUES}}}{I_{\text{EXPENSES}}}$$

