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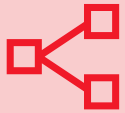
Cost classification and cost assignment

Lecture 2_2.10.2024

Agenda

Cost classifications



Mutual relation between cost classifications

Indirect cost assignment method

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Direct v. indirect costs

- **direct costs**
- can be traced easily and accurately to a cost object

- **indirect costs**
  - cannot be traced to cost objects
  - estimate must be made of the
  - resources consumed by cost objects using **cost allocations (alokace n.)**

- **Cost allocation = the process of assigning costs when a direct measure does not exist for the quantity of resources consumed by a particular cost object**

Direct v. indirect costs

depends on
what is identified as the
cost object

= any activity for which a separate measurement of cost is required

e.g. cost of making 1 piece of product

e.g. cost of providing 1 hour of a service

Product	Smart phone, Tablet computer, SUV Car, Book etc.
Service	An airline flight from Delhi to Mumbai, Concurrent audit assignment, Utility bill payment facility etc.
Project	Metro Rail project, Road projects etc.
Activity	Quality inspection of materials, Placing of orders etc.
Process	Refinement of crudes in oil refineries, melting of billets or ingots in rolling mills etc.
Department	Production department, Finance & Accounts, Safety etc.

What are the possible unit costs in following industries?

- **Automobile?**
- **Construction of building?**
- **Chemicals?**
- **Transport?**
- **Restaurant?**
- **Education?**
- **Hospitals?**

Manufacturing vs. Nonmanufacturing costs

Manufacturing cost

- Direct materials
- Direct labour
- Manufacturing overhead
    - Indirect materials
    - Indirect labour
    - Manintenance and repairs on production equipment
    - Heat and light, property taxes, depreciation, insurance on manufacturing facilitites
- Also environmental costs can be differentiated:
    - Waste Disposal
    - Pollution Control
    - Environmental Compliance
    - Energy Costs

Nonmanufacturing

- Selling costs
- Administrative costs

Prime cost v. Overheads

- answer to question how are costs controlled?
- ***prime costs / per-unit costs***
  - occur with each unit of product/hour of service
  - controlled per unit through technical and economic **standards (calculations/standars)**
- ***Overheads*** opposite to prime cost

  Manufacturing, administration and marketing
  - controlled through budgets
- **Conversion costs**
  - Costs of converting raw materials into finished goods

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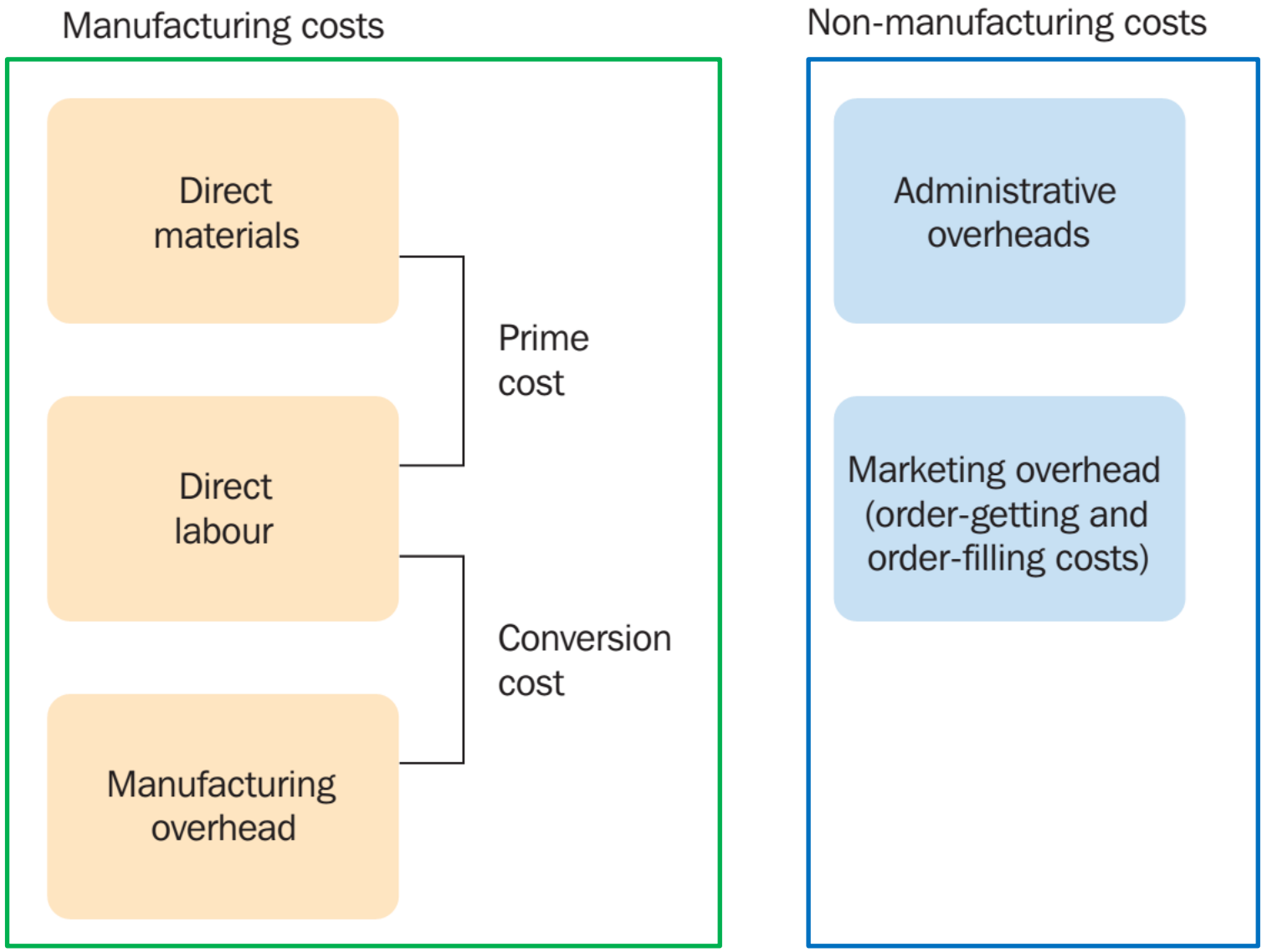
Links of cost categories



Cost collection system

normally accounts for costs in two broad stages:

1. Accumulates costs by classifying them into certain categories (e.g. labour, materials and overheads).
2. Assigns costs to cost objects

Traditional cost systems accumulate product costs as follows:

Direct materials	xxx	
Direct labour	*xxx*	
Prime cost	**xxx**	
Manufacturing overhead	*xxx*	
Total manufacturing cost	**xxx**	
Non-manufacturing overheads	*xxx*	
Total cost		***xxx***

Product and Period Cost

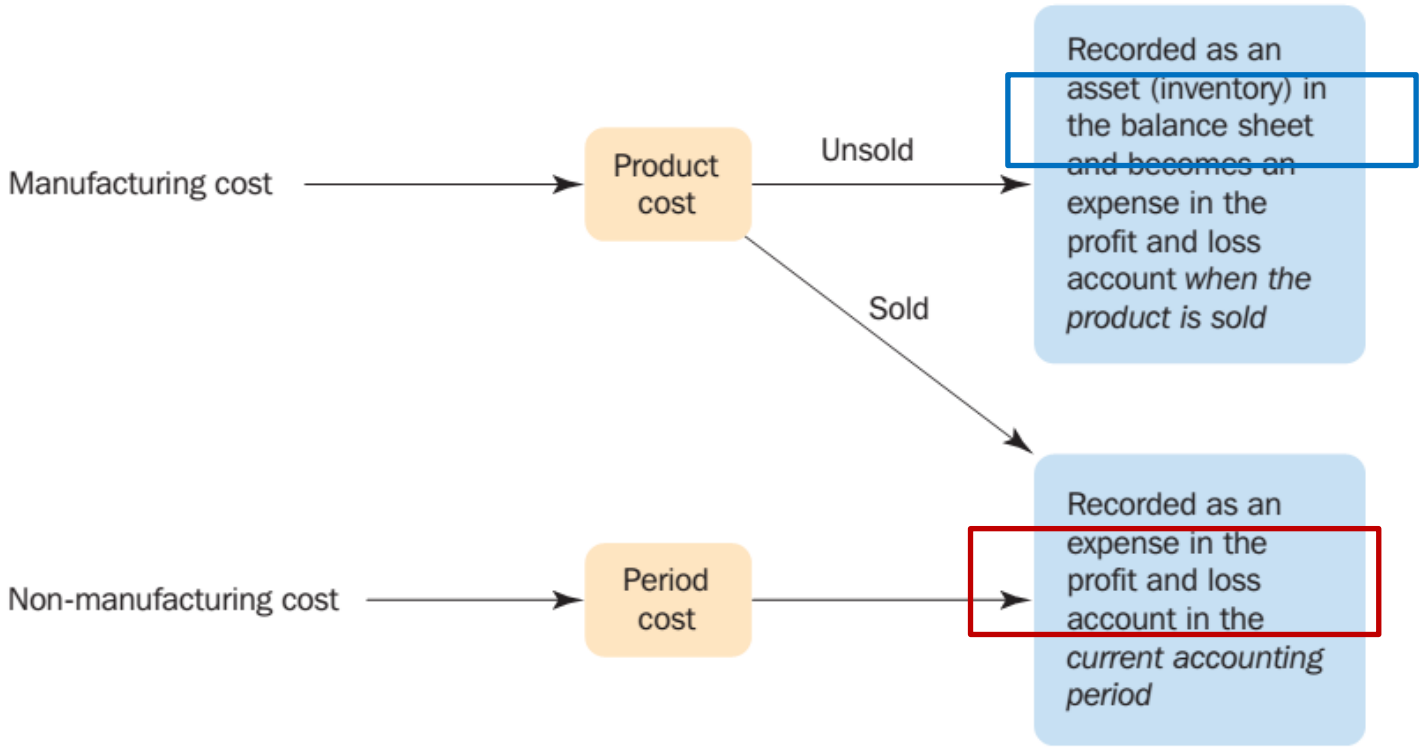
Product costs

- are attached to the products
and included in the stock (**inventory valuation**).

Period costs

- are not attached to the product
and not included in the inventory valuation.

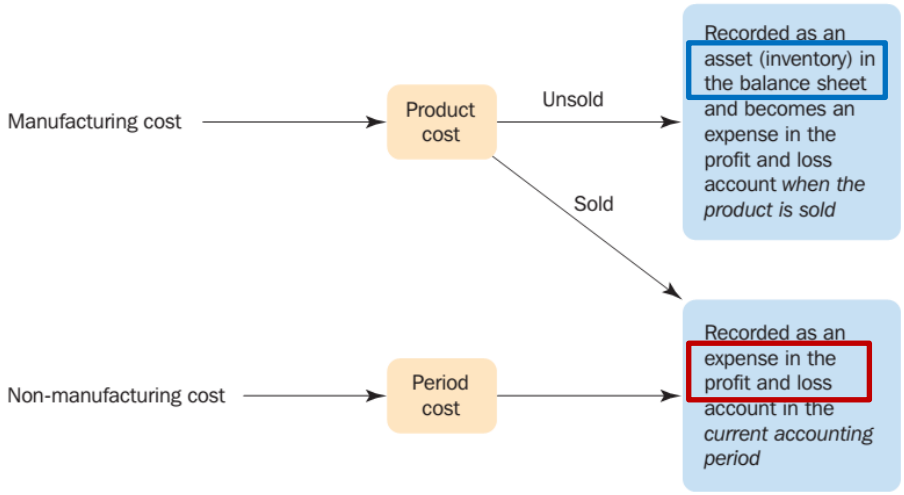
Treatment of Product and Period Cost



Treatment of Product and Period Cost

Example

- production 1000 units
  at manufacturing cost 10 CZK per unit
- 800 units sold at selling price 20 CZK
- admin expenses 3,000 CZK
- selling expenses 2,000 CZK
- **What is the bottom-line?**



Solution:

Profit and loss account

Sales ..... 16,000 CZK

Cost of goods sold (COGS) ..... -8,000 CZK

Period costs ..... -5,000 CZK

Profit / loss = 3,000 CZK

Balance sheet

2,000 CZK in a closing balance of inventory = products in warehouse/store(room)

Do product cost always equal to all manafacturing cost?

- **YES**

  Absorption costing (also known as **full costing**)
- traces all manufacturing costs to products
- non-manufacturing overheads as a period cost.

- **NO**

  Variable costing (also known as **direct** or **marginal costing**)
- traces **all variable** costs to products
- fixed manufacturing overheads and non-manufacturing overheads as a period cost

Absorption v. variable costing

Some arguments in support of variable costing

- Variable costing provides more **useful information for decision-making**.
- Variable costing **removes** from profit the **effect of stock changes**.
- Variable costing **avoids fixed overheads being capitalized** in unsaleable stocks.

Some arguments in support of absorption costing

- Absorption Costing does not understate the **importance of fixed costs**.
- Absorption costing **avoids fictitious losses being reported** (e.g. stocks accumulated for seasonal sales).

The debate just for internal reporting!

- **External** reporting (IFRS, US GAAP) insist on **full costing!**

Product costs
= all manufacturing costs

Full costs (for inventory valuation)

- production 1000 units
  at manufacturing cost 10 CZK per unit
  involving variable cost 6 CZK per unit
- 800 units sold at selling price 20 CZK
- admin expenses 3,000 CZK
- selling expenses 2,000 CZK

Solution:

Profit and loss account

Sales ..... 16,000 CZK
Cost of goods sold (COGS) ..... -8,000 CZK
Period costs ..... -5,000 CZK
Profit / loss = 3,000 CZK

Balance sheet

2,000 CZK in a closing balance of inventory = products in warehouse/store(room)

NOT all manufacturing costs are product costs

Variable costs (for inventory valuation)

- production 1000 units
  at manufacturing cost 10 CZK per unit
  involving variable cost 6 CZK per unit
- 800 units sold at selling price 20 CZK
- admin expenses 3,000 CZK
- selling expenses 2,000 CZK

Solution:

Profit and loss account

Sales ..... 16,000 CZK
Cost of goods sold (COGS) ..... -4,800 CZK
Period costs ..... -9,000 CZK (incl.-4.000 CZK fixed manufact.)
Profit / loss = 2,200 CZK

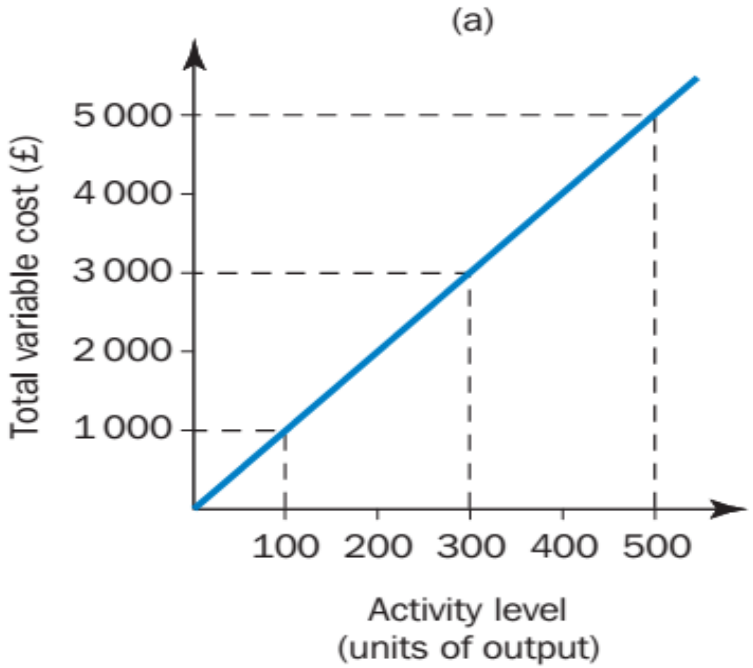
Balance sheet

1,200 CZK in a closing balance of inventory = products in warehouse/store(room)

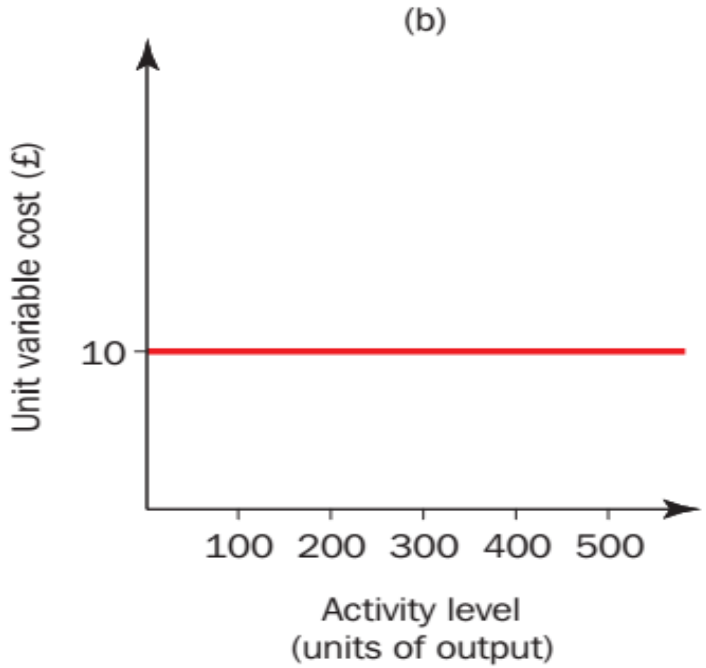
Variable v. Fixed Cost

Variable costs:

(a) total:



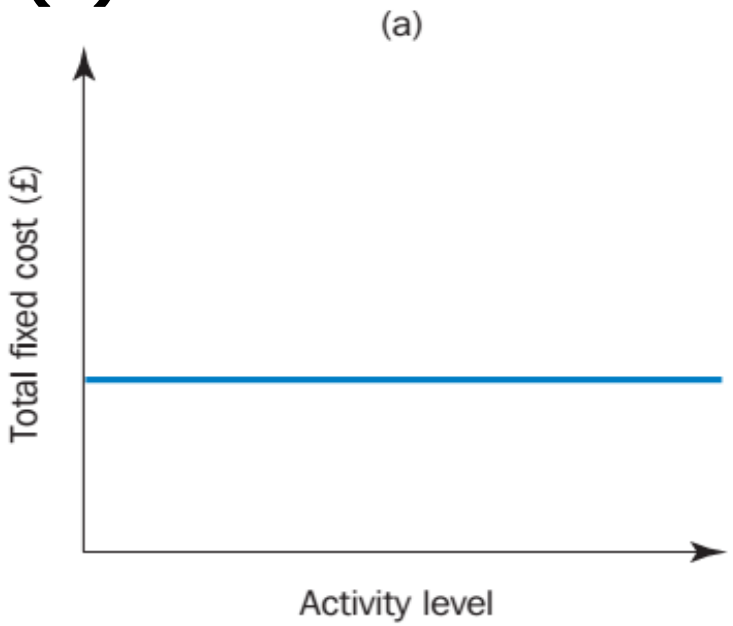
(b) unit



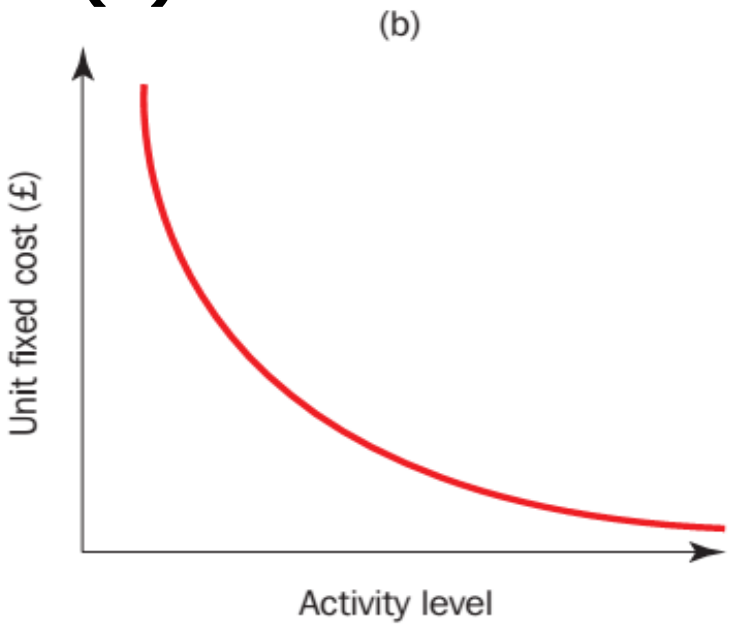
Variable v. Fixed Cost

Fixed costs:

(a) total:



(b) unit

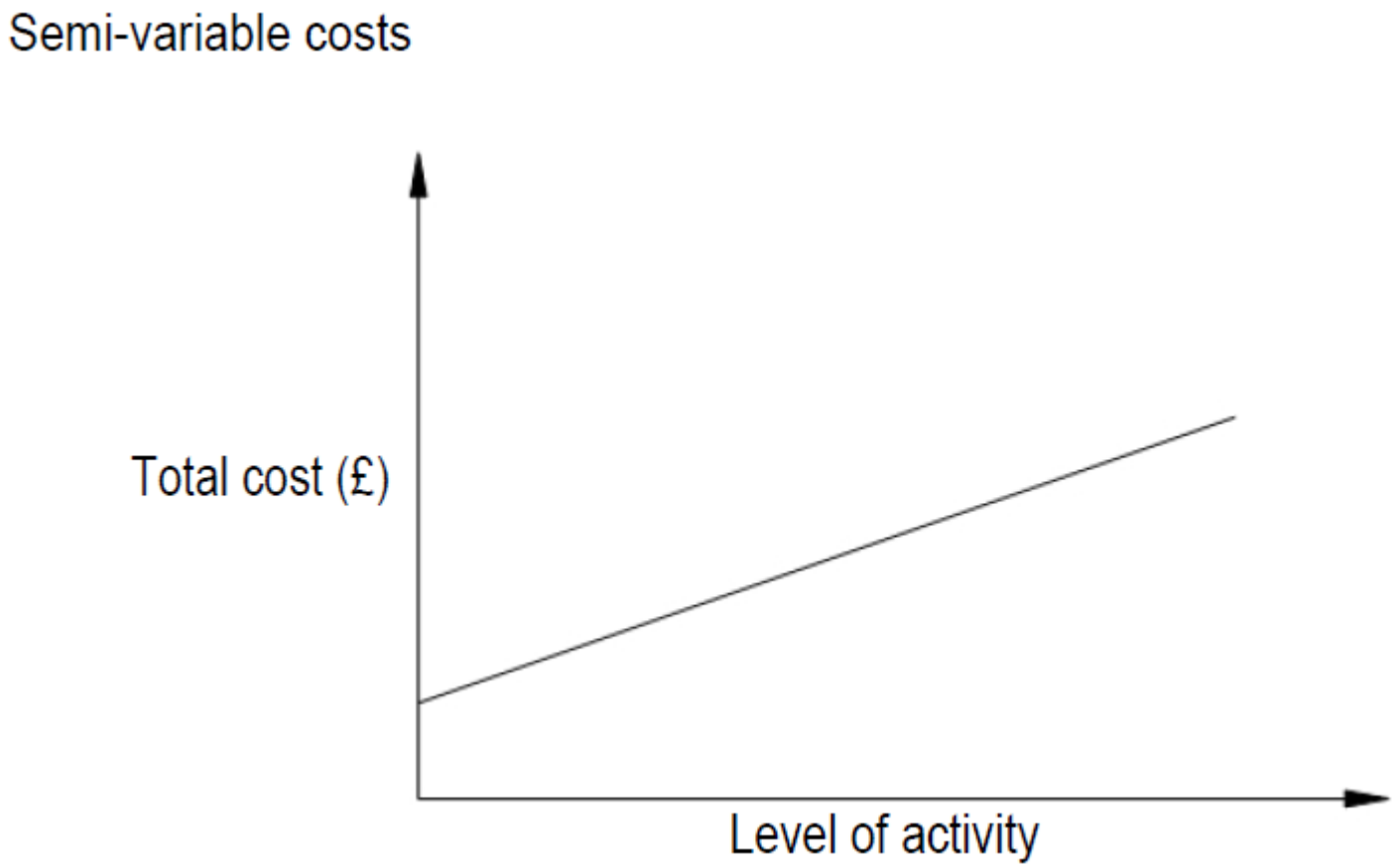


Classification by cost behaviour

- Important to predict costs and revenues at different activity levels for many decisions.
- **Variable costs**
- **Fixed costs**
- **Semi-fixed** costs are fixed within specified activity levels, but they eventually increase or decrease by some constant amount at critical activity levels.
- **Semi-variable** costs (=mixed cost) include
  both a fixed and a variable component (e.g. telephone charges).

- the classification of costs depends on the time period involved.

Semi-variable (=mixed) costs



Semi-variable cost
How to separate var. and fix.c.?

high-low method

regression analysis

(ordinary least square method)

inspection of accounts

Fixed Costs

more detailed classification:

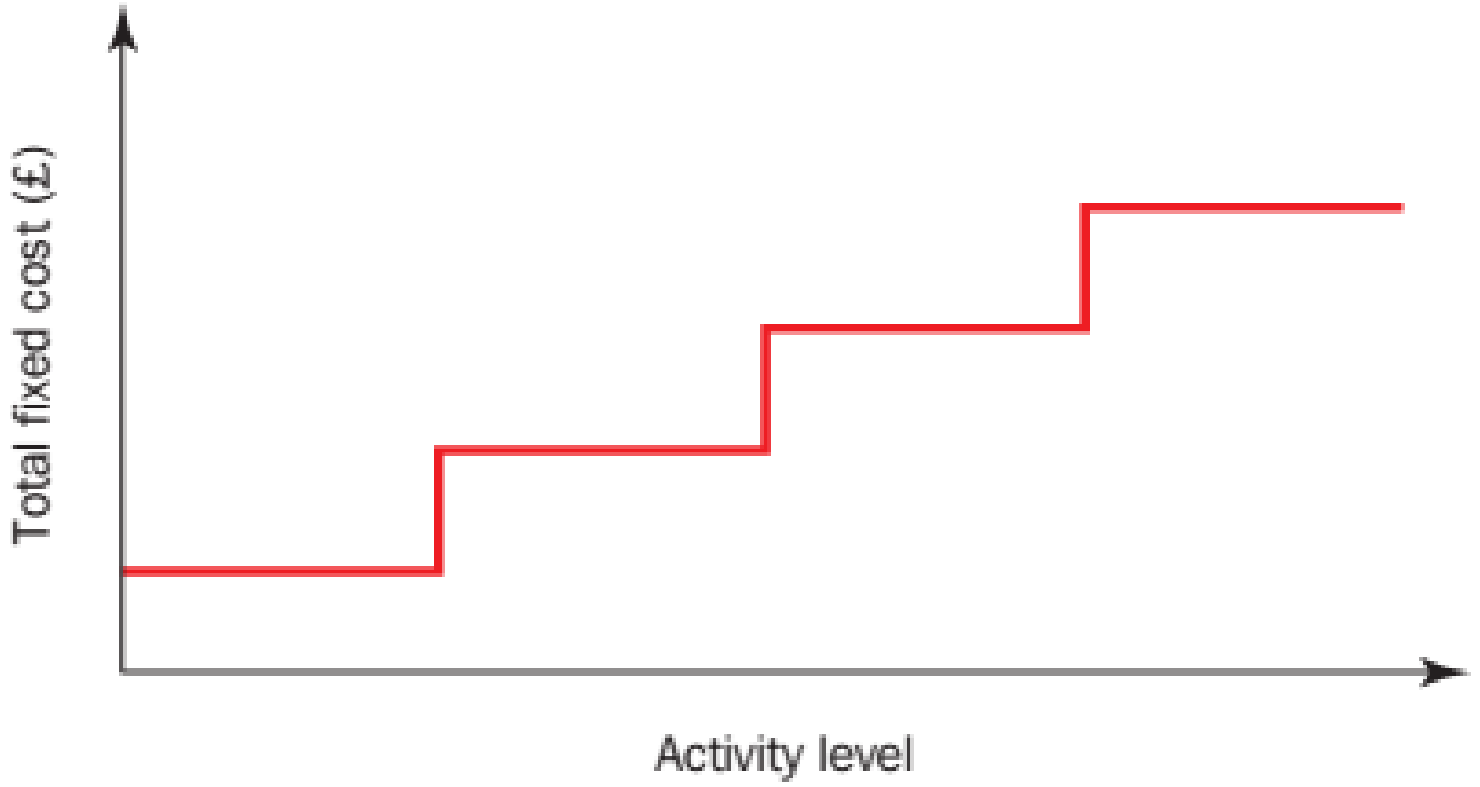
sunk fixed costs **(=unavoidable)**

costs of resources already acquired
(e.g. depreciation)
connected with **establishing** the production **capacity**

avoidable fixed costs

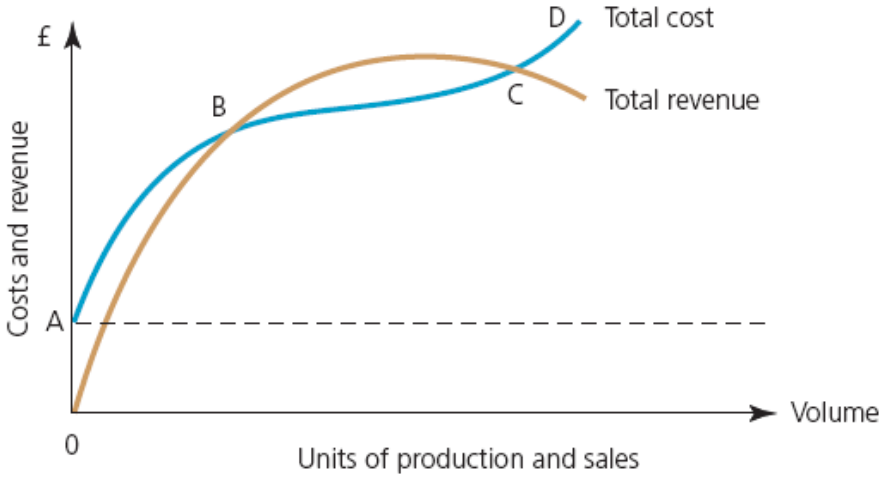
incured when the produciton **capacity is running**
(e.g. wages of supervisors, servicemen, heating, lighting)
fixed, but can be avoided if production stops completely

Semi-fixed Costs

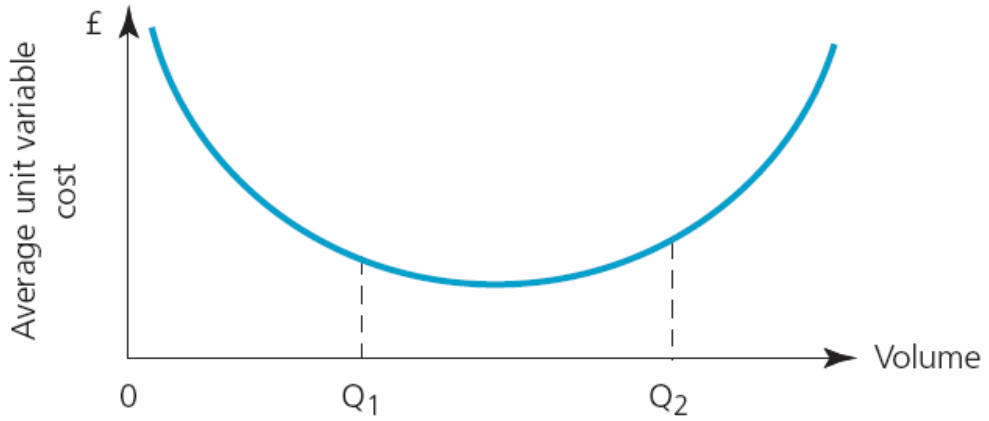


Microeconomic foundations

Total revenues/costs



Unit variable costs



Shape of the **total cost function** (initial steep rise, levels off, followed by a further steep rise)

The total revenue

(line initially rises steeply, then levels off and declines)

Curvilinear graph results in

two break-even points.

Curvilinear variable cost function

1. Output levels between 0 and Q1 = **Increasing returns to scale**
2. Output levels between Q1 and Q2 = **Constant returns to scale**
3. Output levels beyond Q2 = **Decreasing returns to scale**

Relevant v. irrelevant costs and revenues

relevant = future costs and revenues that will be changed by a decision

irrelevant costs and revenues will not be changed

Example

Materials previously purchased for £100 have no alternative use other than being converted for sale at a cost of £200. The sale proceeds after conversion would be £250.

Convert or not convert?

Avoidable vs. Unavoidable/sunk costs

more detailed classification:

sunk costs **(=unavoidable)**

costs of resources already acquired
(e.g. depreciation)
connected with **establishing** the production **capacity**

avoidable costs

incured when the produciton **capacity is running**
(e.g. wages of supervisors, servicemen, heating, lighting)
fixed, but can be avoided if production stops completely

Opportunity costs

Opportunity costs

measures the opportunity that is lost or sacrificed when the choice of one course of action requires that an alternative course of action is given up.

Incremental v. **Marginal**

costs/revenues

Incremental (přírůstkové)
= additional costs/revenues from the production **of a *group* of additional units**.
Marginal (marginální/mezní)
= additional costs/revenues from the production **of *one* additional unit** of output

2.28 Intermediate: Sunk and opportunity costs for decision-making. Mrs Johnston has taken out a lease on a shop for a down payment of £5000. Additionally, the rent under the lease amounts to £5000 per annum. If the lease is cancelled, the initial payment of £5000 is forfeit. Mrs Johnston plans to use the shop for the sale of clothing, and has estimated operations for the next 12 months as follows:

	(£)	(£)
Sales	115 000	
Less Value-added tax (VAT)	15 000	
Sales less VAT		100 000
Cost of goods sold	50 000	
Wages and wage related costs	12 000	
Rent including down payment	10 000	
Rates, heating, lighting and insurance	13 000	
Audit, legal and general expenses	2 000	
		87 000
Net profit before tax		13 000

In the figures, no provision has been made for the cost of Mrs Johnston but it is estimated that one half of her time will be devoted to the business. She is undecided whether to continue with her plans, because she knows that she can sublet the shop to a friend for a monthly rent of £550 if she does not use the shop herself.

Case to solve in pairs

- **Explain and identify sunk and opportunity costs**
- **State the decision ?rs Johnson should make according the information given, supporting your conclusion with a financial statement**

Opportunity cost

- 550 £ *12-5.000 £ (rent) =1.600 £

Sunk cost

- 5.000 £

Potential profit calculation

- Net sales 100.000 £
- Costs - 82.000 £
- Opportunity costs -16.000 £
- **Net profit** **16.400 £**

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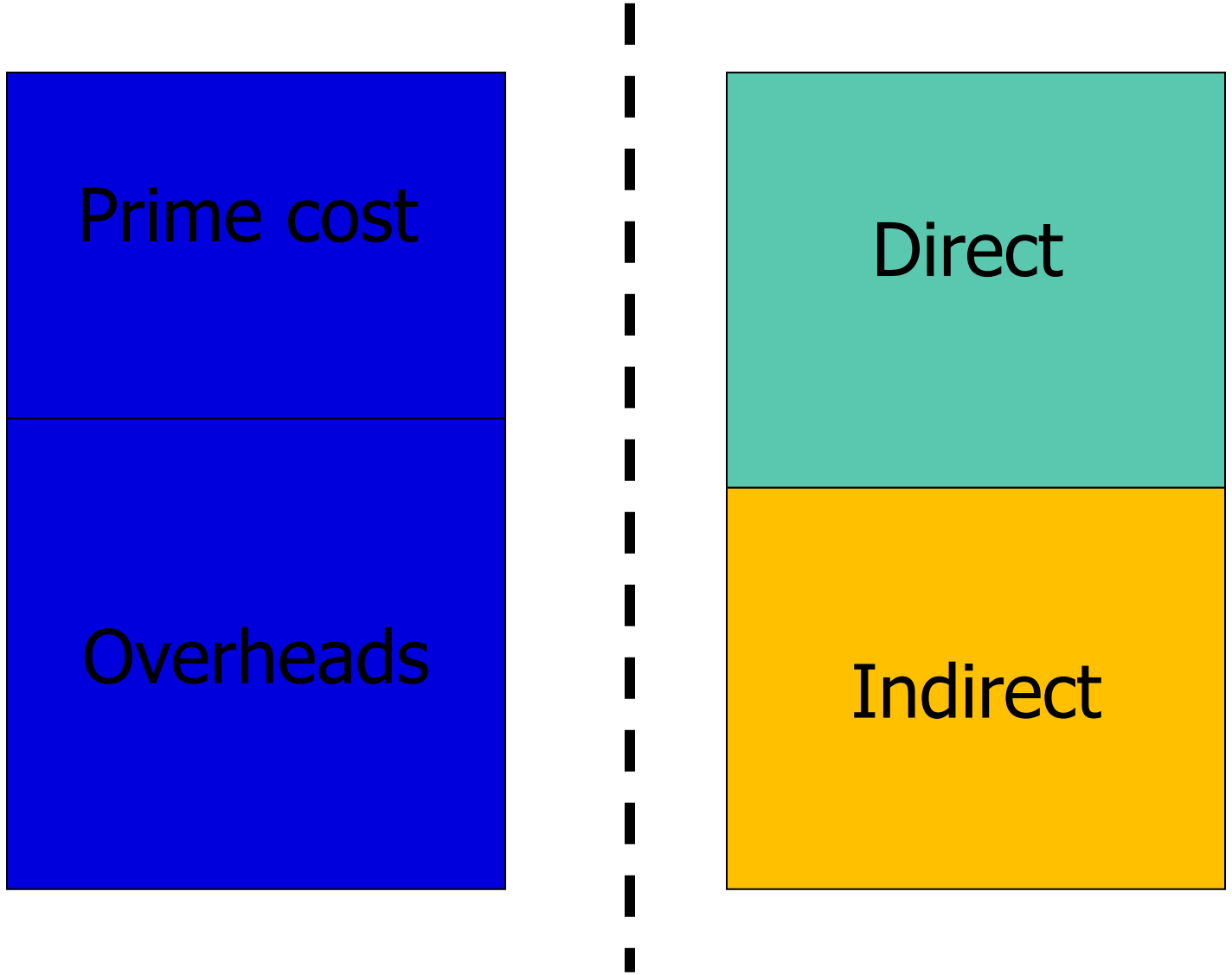
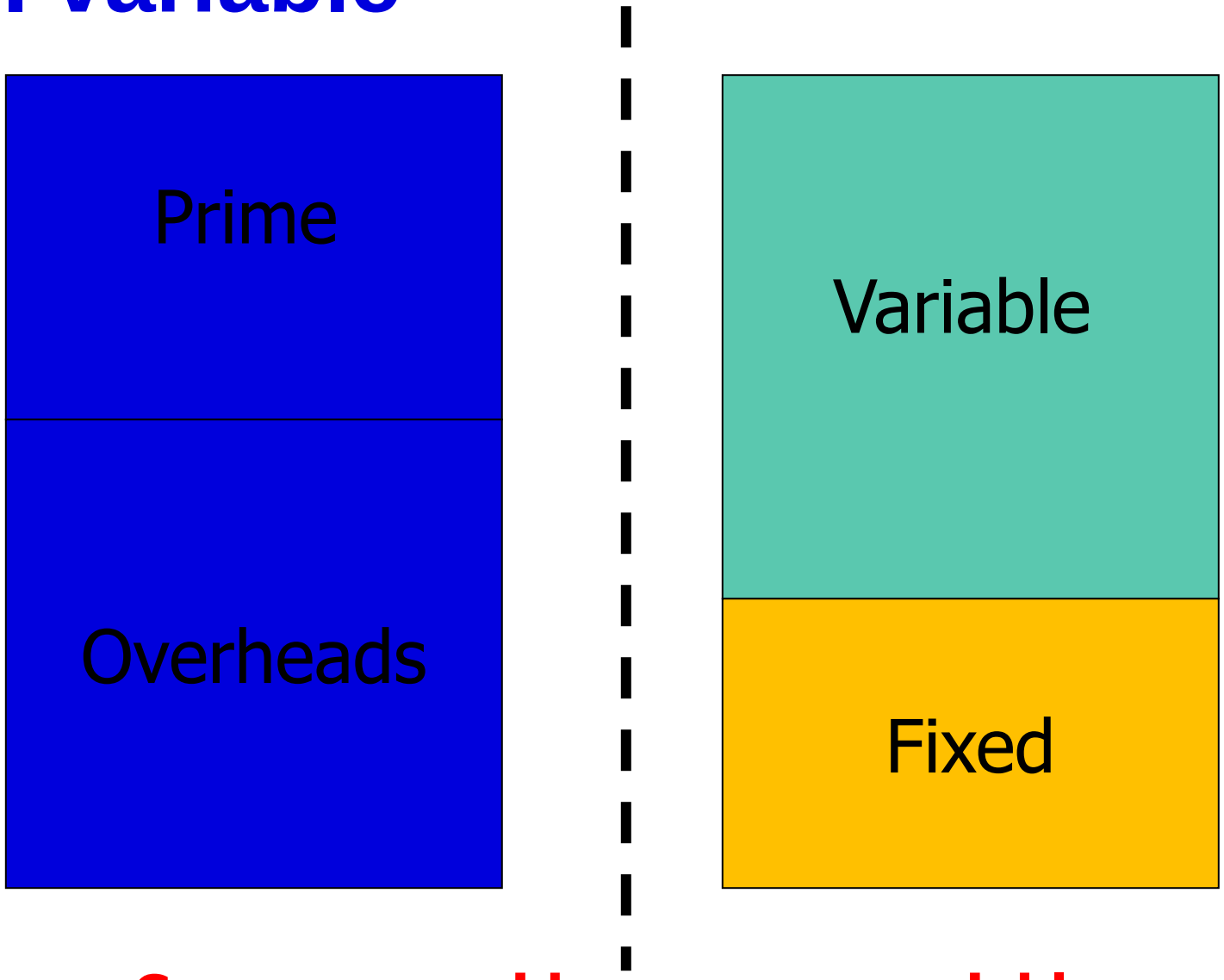
Mutual relations between cost categories

Prime v. direct cost



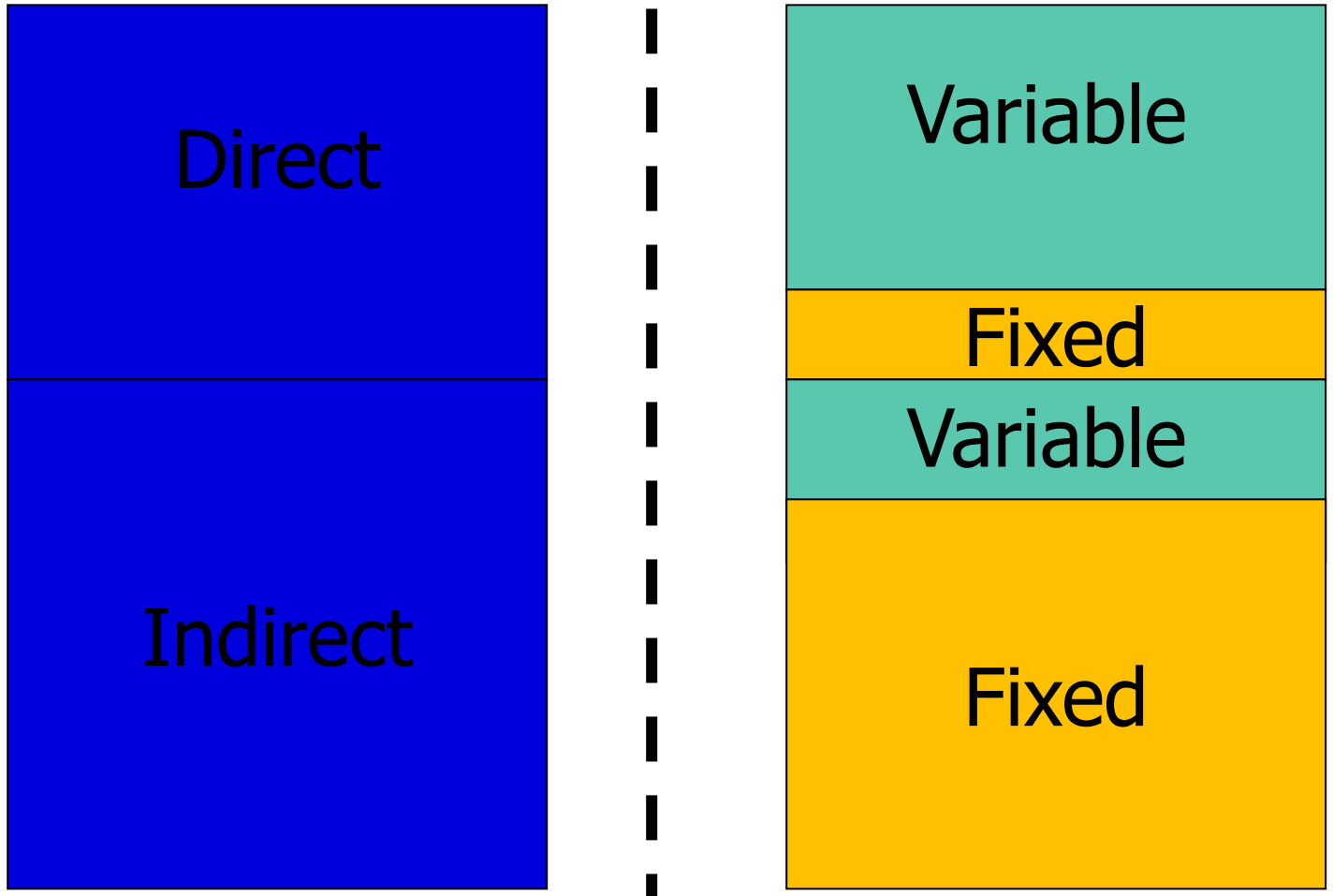
Can you provide me some direct overhead example?

Prime v. variable



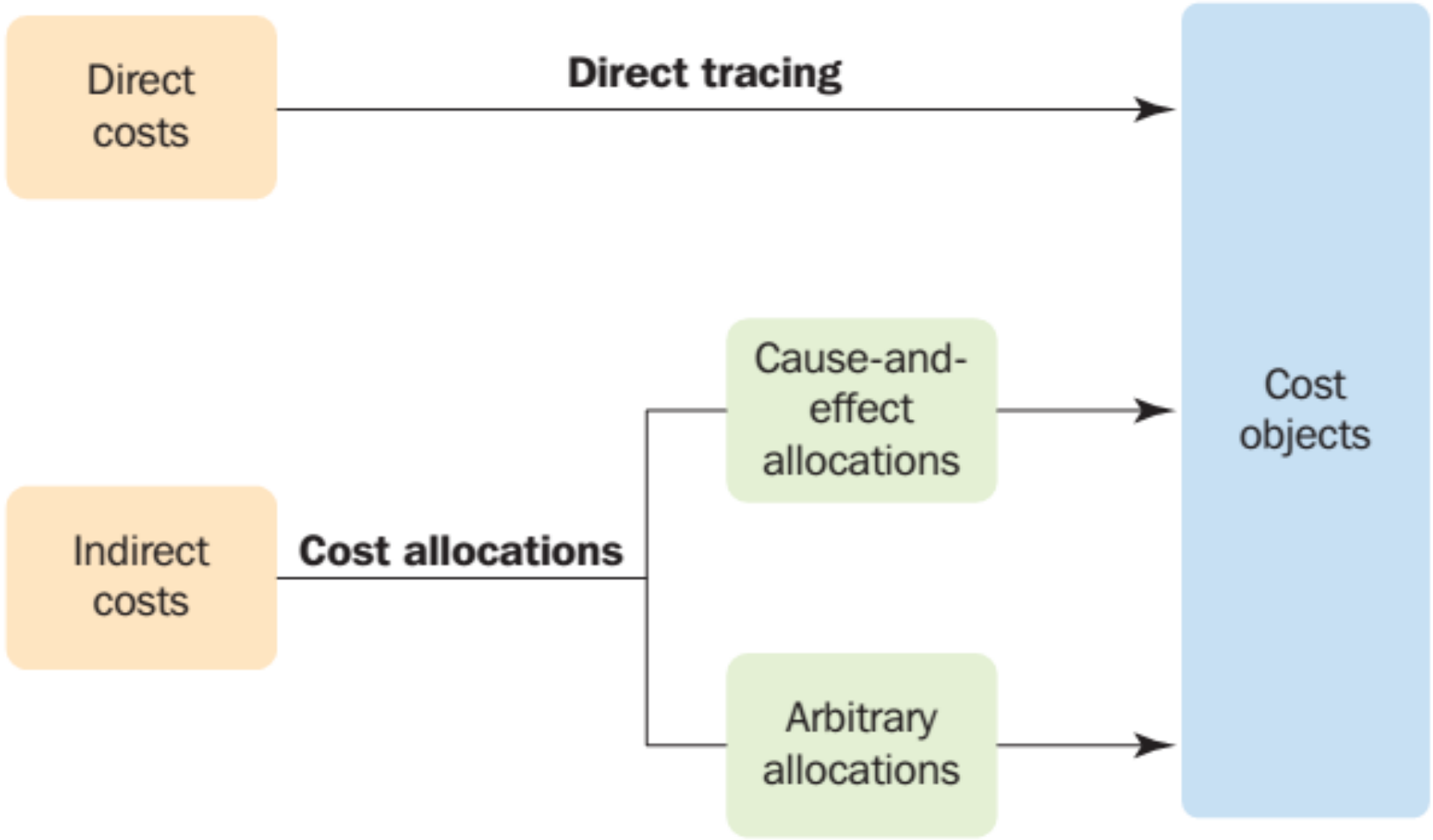
Can you provide me some variable

Direct v. variable



What about some indirect variable

Cost assignment methods



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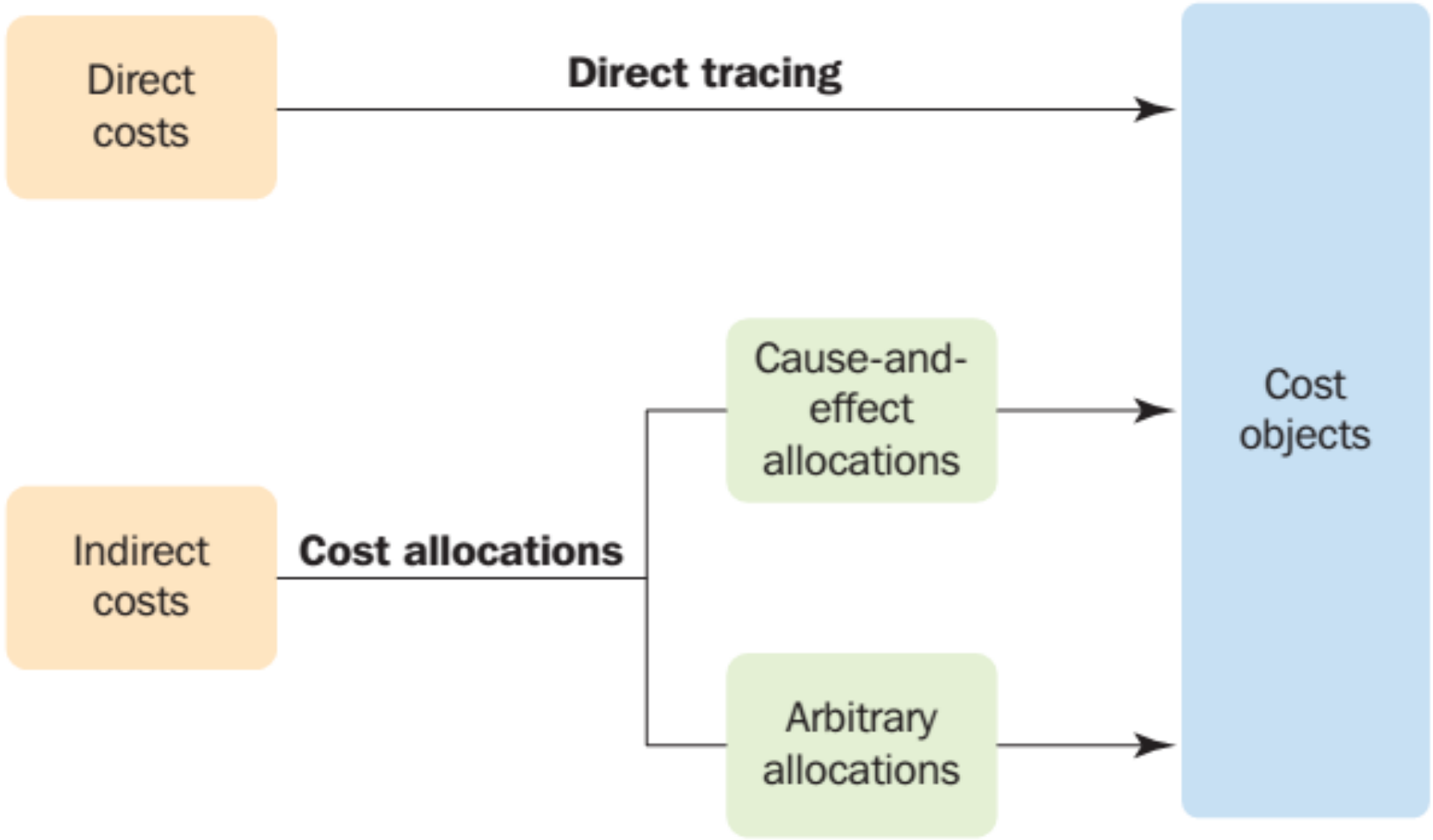
Indirect cost assignment

Cost assignment methods



Example
Furniture Inc.

3 types of products

- wardrobes
- tables
- drawers

annual costs

$ 2,791,160

How to assign cost
to 1 unit of each product?

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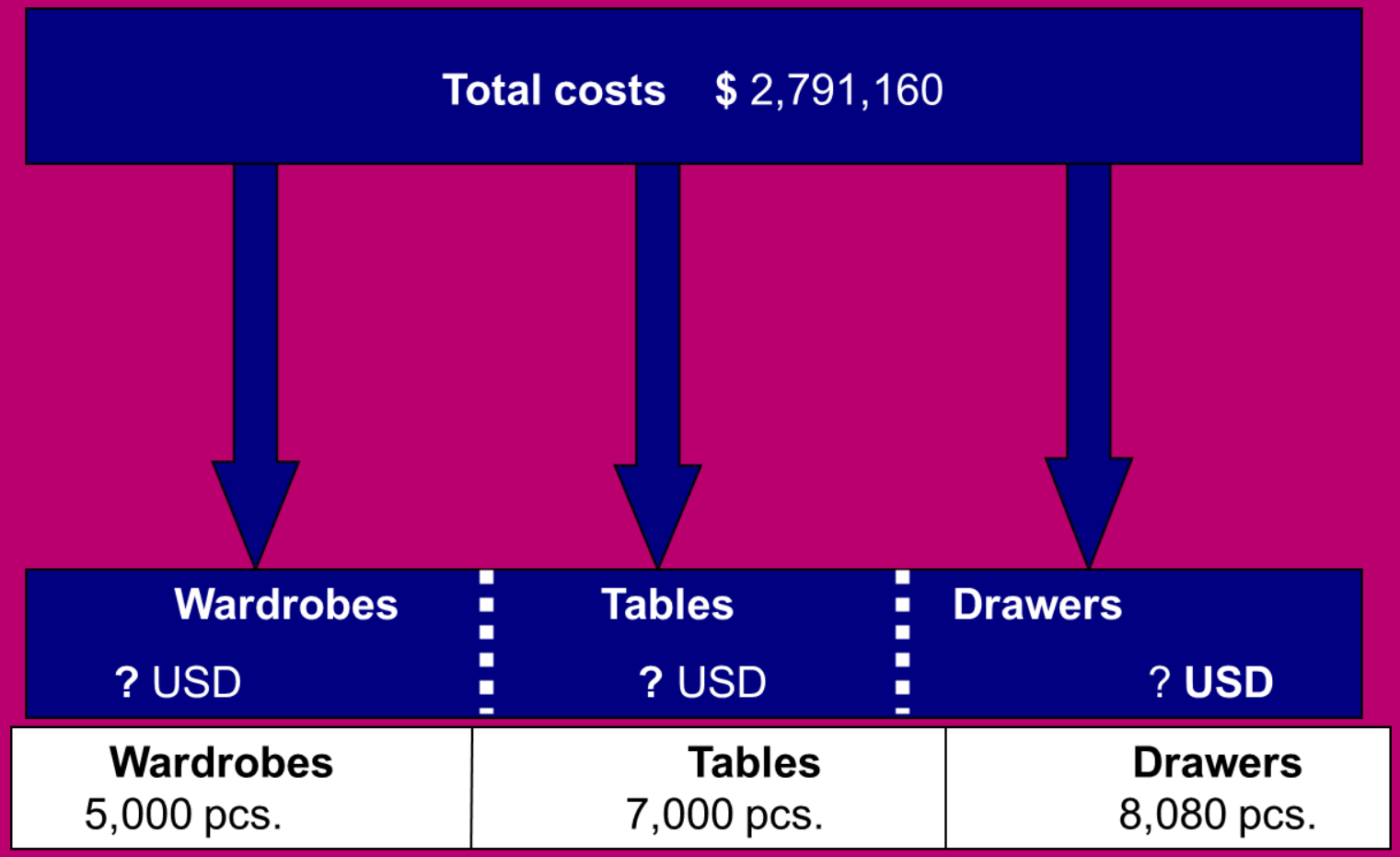
Furniture s.r.o.



per unit: ? USD

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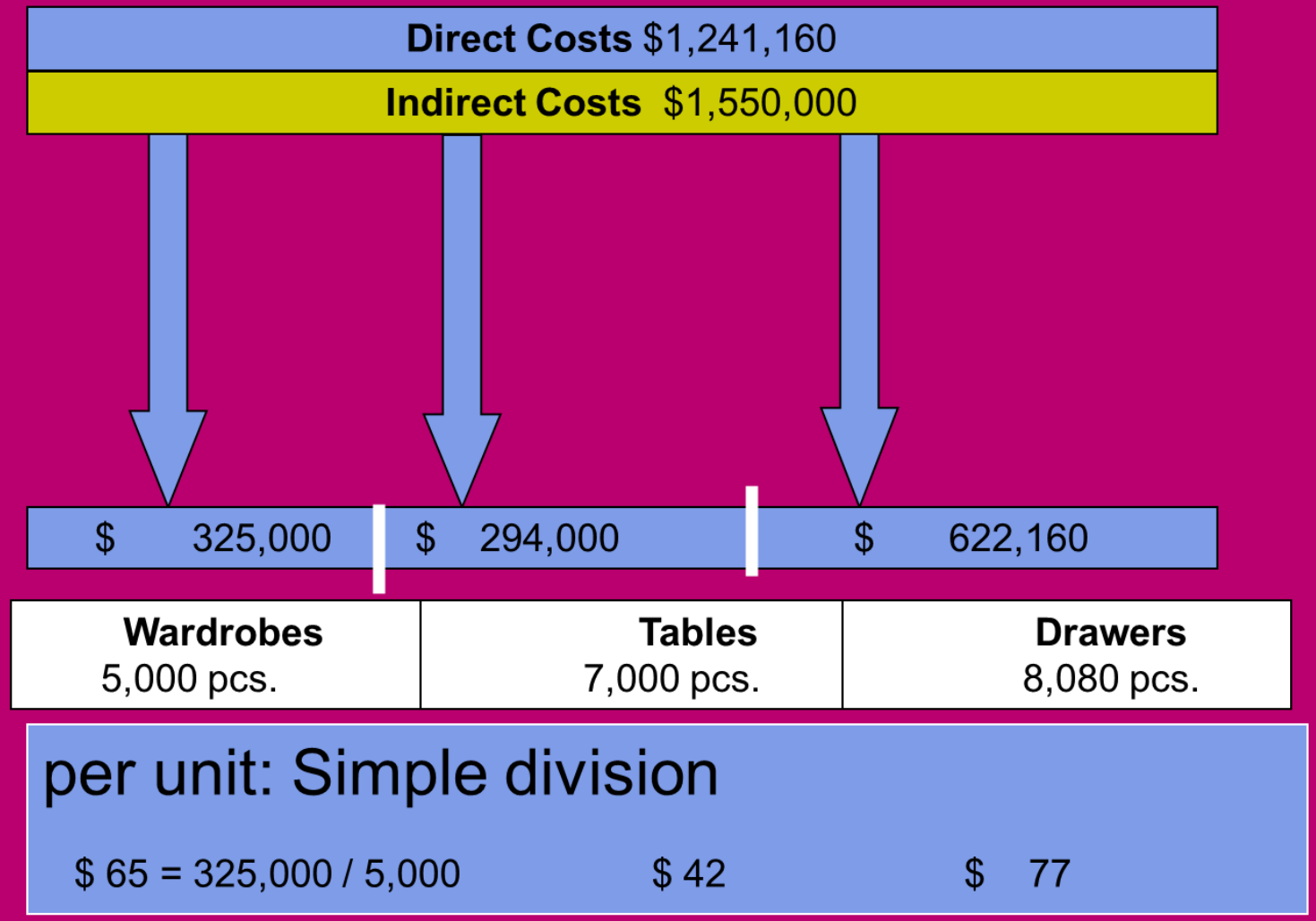
Direct Costs



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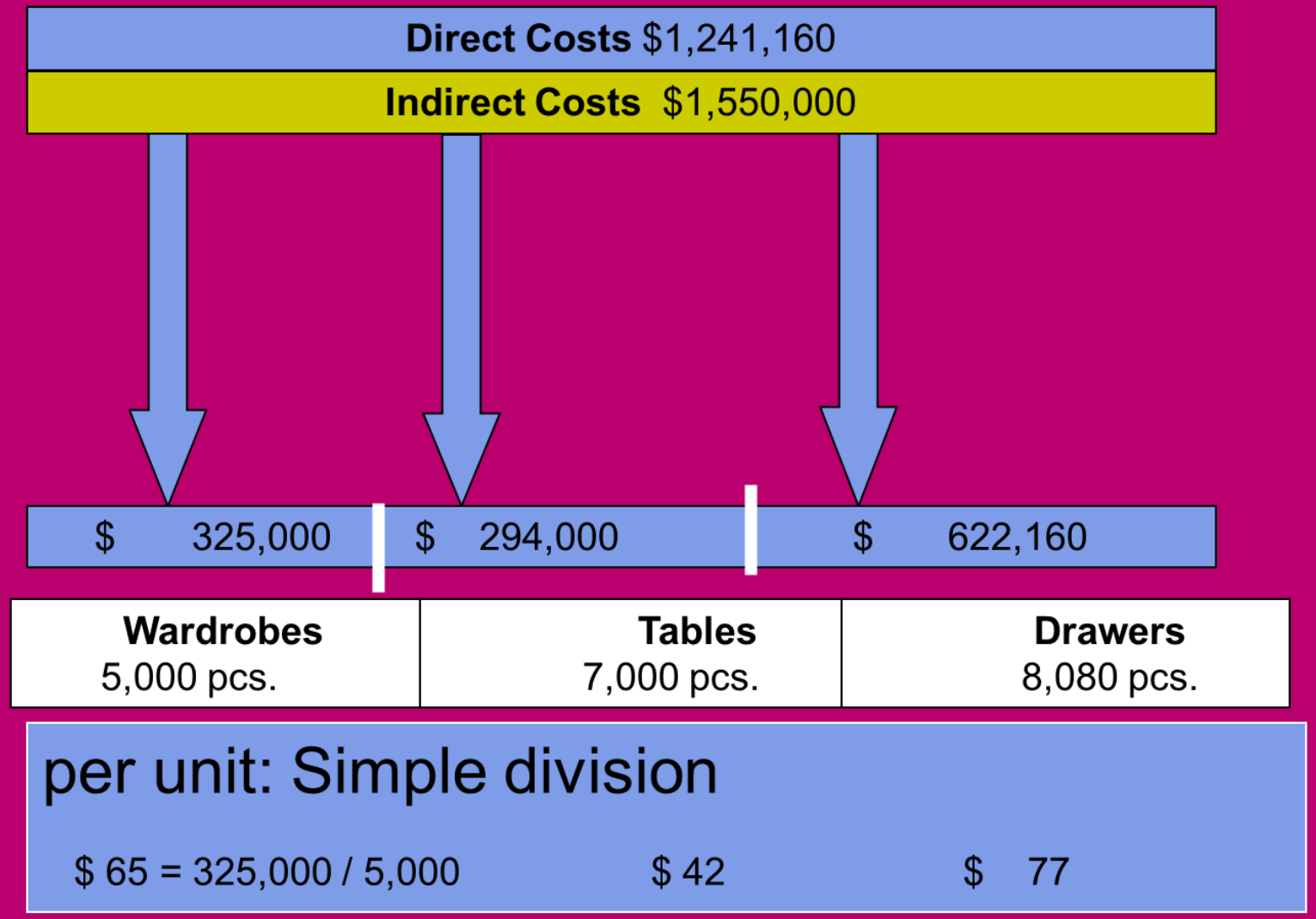
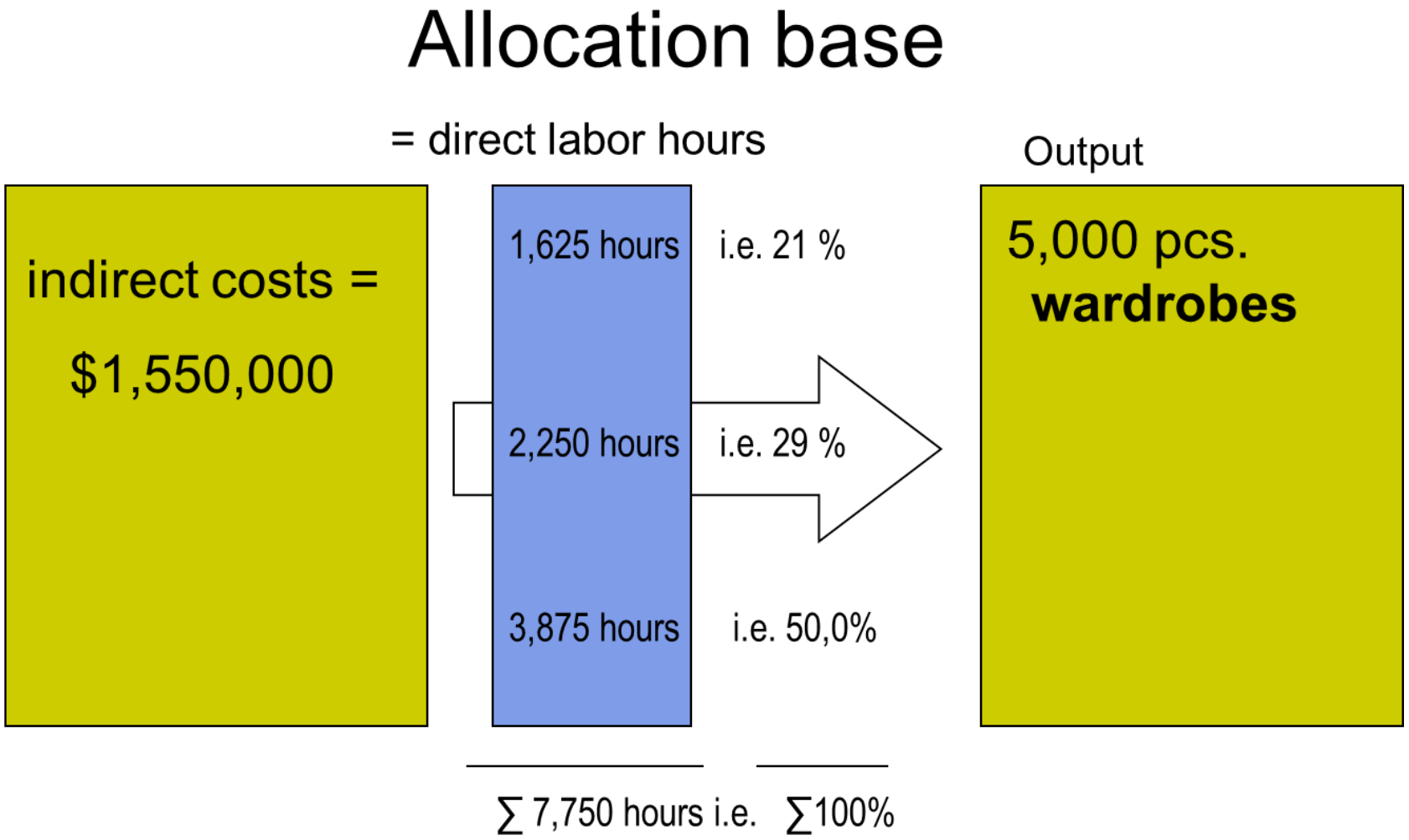
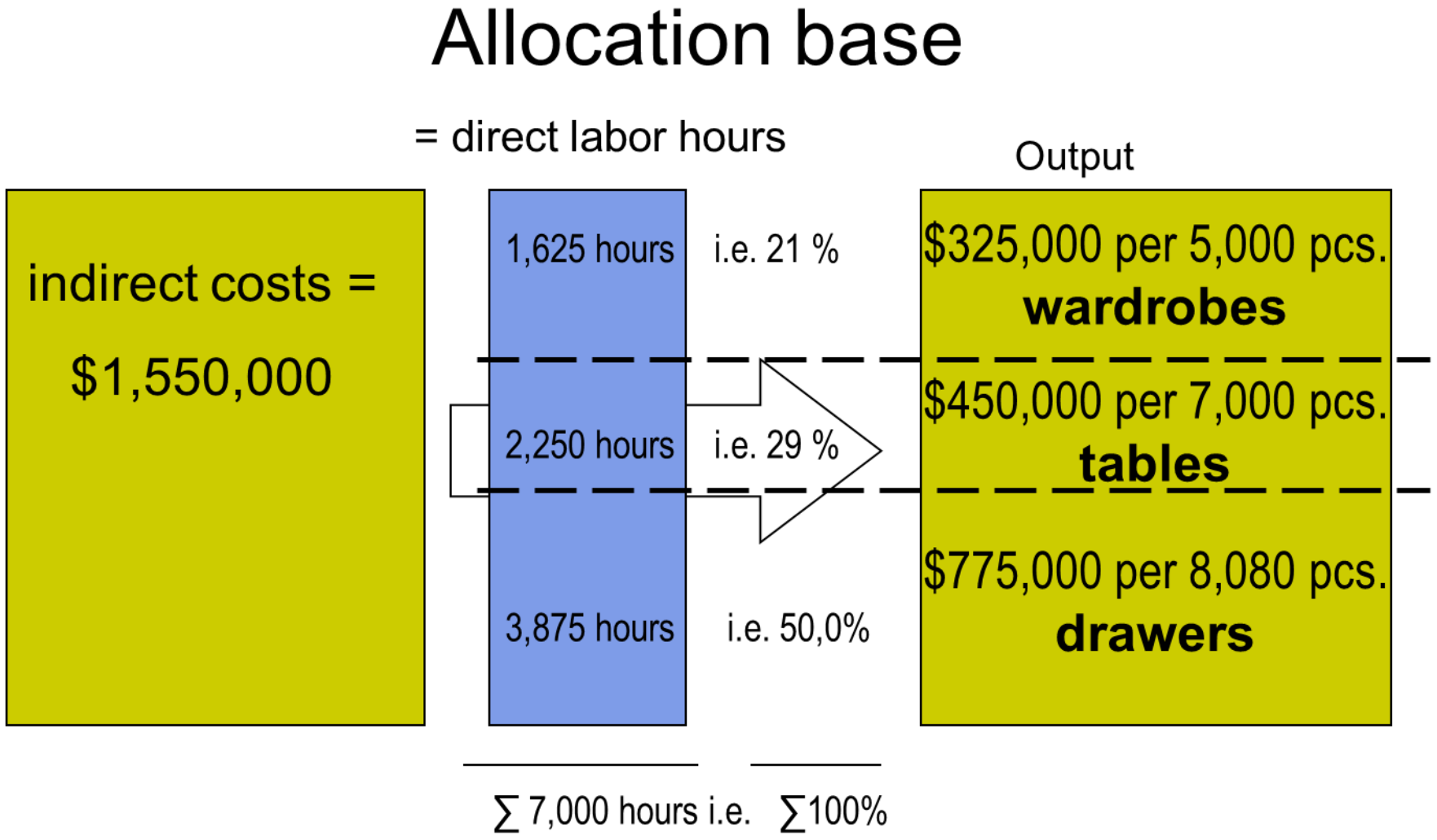
Indirect Costs



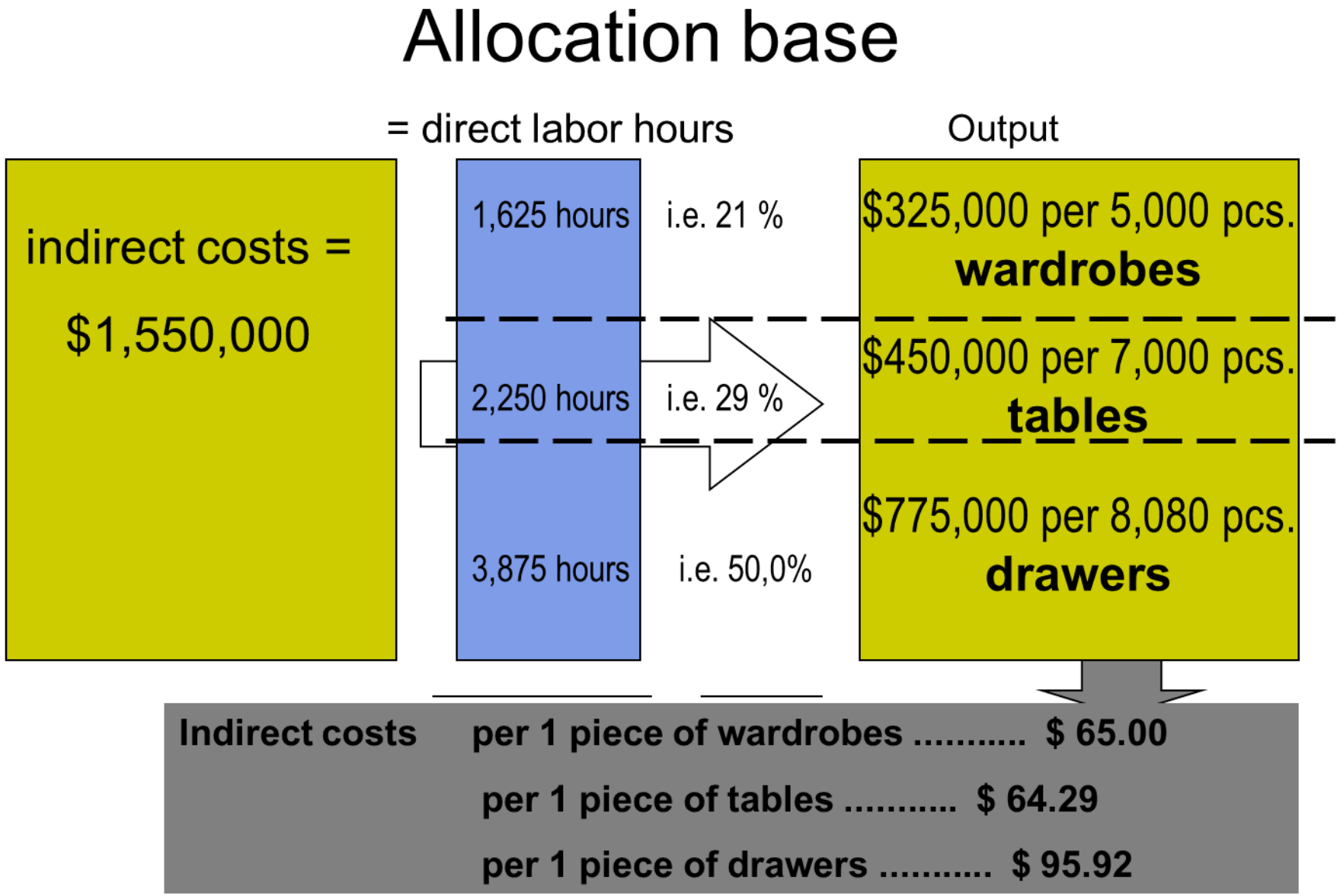
Indirect cost allocation
Plant-wide overhead rate (1/6)



Indirect cost allocation
Plant-wide overhead rate (2/6)

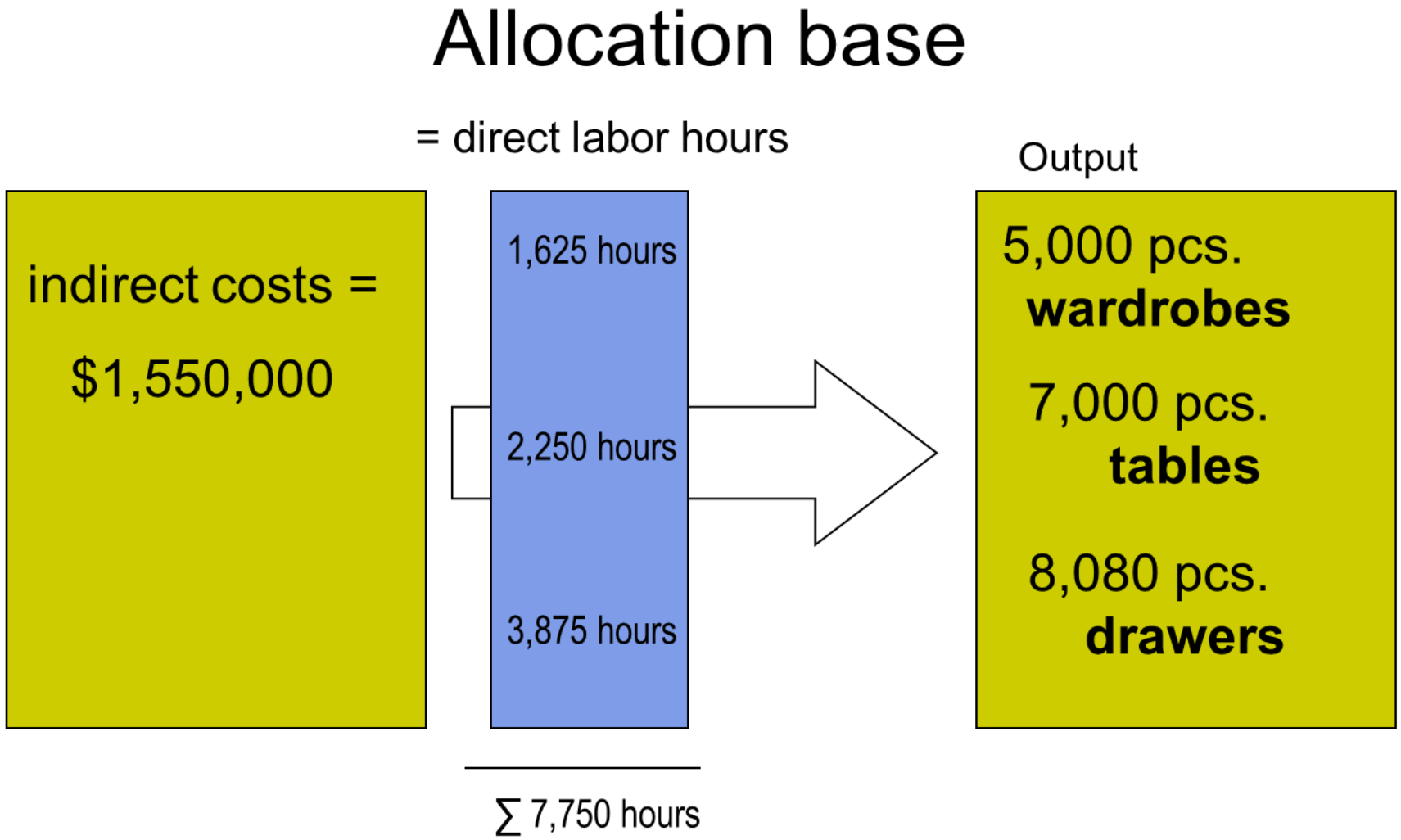


Indirect cost allocation **(3/6)**



Plant-wide overhead rate (4/6)

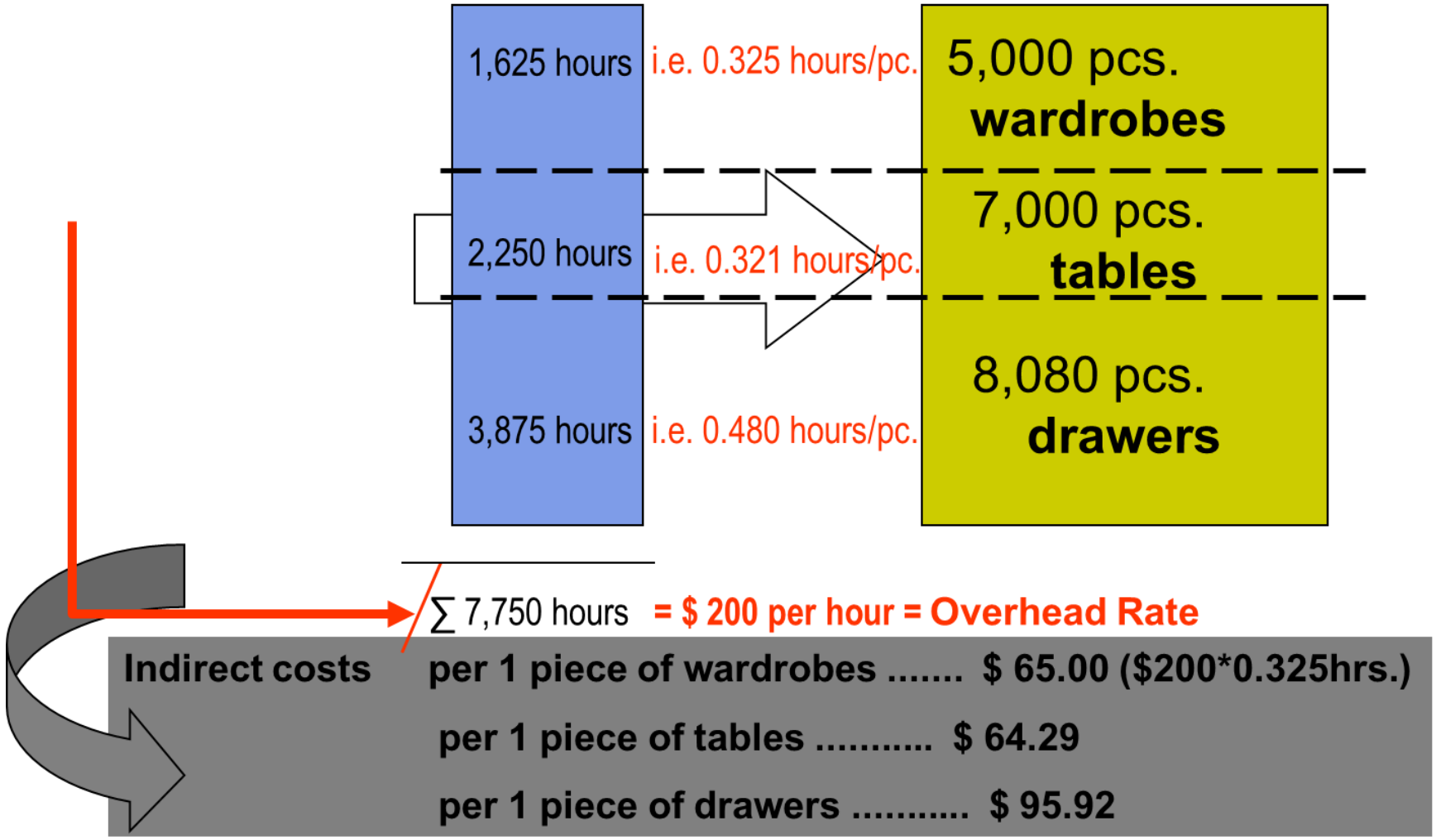
Alternative method of computation



Plant-wide overhead rate (6/6)

Alternative method of computation

Allocation base = direct labor hoursOutput



In practice: Multidimensional cost information systems

Cost accounting system of a real large firm generates usually **more cost dimensions simultaneously**, at least for:

1. **inventory valuation** for internal and external profit measurement
2. managers' **decision-making** based on relevant information
3. **planning**, **control** and performance measurement

Thank you for your Attention!