Theme 2: Managing business activities

Chapter 37 and 38 – February, 2017

Production, productivity and efficiency

Production

- *Production*: resources $\rightarrow$ products
- Production industries:
  - *primary* industry: agriculture
  - *secondary* industry: manufacturing
  - *tertiary* industry: services

Production, productivity and efficiency

Job production

- *Job production*:
  - production of a single product at a time
  - one job is completed at a time
- Example:
  - small scale: baking of cake
  - large scale: construction of ship
- labour intensive production
- workforce made up of skilled workers
- method of production used by *starting-ups*

Advantages	Disadvantages
Quality is high because workers are skilled	High labour costs due to skilled workers
Workers are well motivated because work is varied	Production may be slow – long lead times
Products can be custom made	A wide range of specialist tools may be needed
Production is easy to organise	Generally an expensive method of production

Production, productivity and efficiency

Batch production

- *Batch production*:
  - when demand for product is *regular*
  - Example: furniture factory
- production is divided into a number of operations
- each operation done on a batch (*standardistaion*)
- method of production used in manufacturing
- lowers the *unit cost* (or *average cost*) of production

Advantages	Disadvantages
Workers are likely to specialise in one process	More complex machinery may be needed
Unit costs are lower because output is higher	Careful planning and co-ordination is needed
Production is flexible since different orders can be met	Less motivation because workers specialise
More use of machinery is made	If batches are small, costs will still be high
	Money may be tied up in work-in-progress

Production, productivity and efficiency

Flow production or mass production

- operations are carried out in a *continuous sequence*
- Example: car production, newspapers, food
- Main features of flow production:
  - production of *large quantities*
  - *simplified* or *standardised* product
  - *semi-skilled* workforce
  - large amounts of *machinery/equipment*
  - large stocks of *raw materials/components*
- Types of flow production
  - continual flow production (i.e., clothing)
  - repetitive flow production (i.e., toy parts)

Advantages	Disadvantages
Very low unit costs due to economies of scale	Products may be too standardised
Output can be produced very quickly	Huge set-up costs before production can begin
Modern plant and machines can allow some flexibility	Worker motivation can be very low – repetitive tasks
Production speed can vary according to demand	Breaks in production can be very expensive

Production, productivity and efficiency

Cell production

- method involves dividing the workplace into *cells*
- each cell occupies composes a *product family*
- tasks for a given cell may be: designing, scheduling, planning, maintenance and problem solving
- *advantages* of cellular manufacturing
  - more space (cells use less space than a miner production)
  - more *product flexibility*
  - less *lead times*
  - less *handling time*
  - less *work-in-progress*
  - encourages *teamworking*
  - safer working environment

Production, productivity and efficiency

Productivity

- *productivity*: amount of output that can be produced with a given input of resources
- *labour productivity*: output per worker per time.

$$\text{labour productivity} = \frac{\text{number of units produced}}{\text{number of workers}} \tag{1}$$

  - difficulty of defining *number of workers* (include clerical staff?)

- *capital productivity*:

$$\text{capital productivity} = \frac{\text{number of units produced}}{\text{amount of capital employed}} \tag{2}$$

PRODUCTION $\neq$ PRODUCTIVITY

- production $\rightarrow$ *level* of output produced
- productivity $\rightarrow$ *rate* of output produced

Production, productivity and efficiency

Factors influencing productivity

- specialisation and the division of labour:
- education and training: improve quality of labour
- motivation of workers: motivation raises productivity (i.e., introduce job rotation)
- working practices: cahnging factory layout may improve productivity
- labour flexibility: *flexitime* or getting the skills to do several task improves productivity (i.e., supermarket)
- capital productivity: new technology $\rightarrow$ raise productivity (i.e., new technologies)

Production, productivity and efficiency

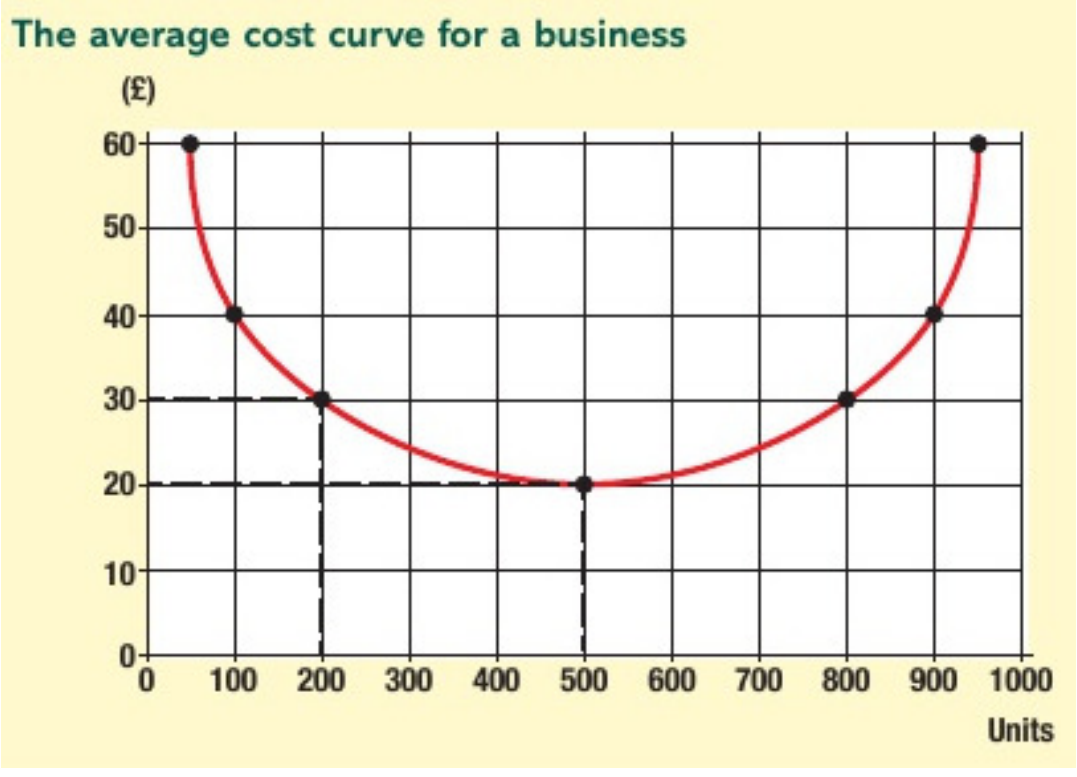
Productivity and competitiveness

- if productivity raises $\rightarrow$ prices fall $\rightarrow$ competitivity raises
- this will also be true regarding *international competitivity*
- international competitivity also depends on other factors (*exchange rate*)

Production, productivity and efficiency

Efficiency

- *efficiency*: making the best possible use of all business's resources
- indicator of efficiency: cost, average cost



Production, productivity and efficiency

Factors influencing efficiency

- standardisation: using uniform resources/activities or producing a uniform product.
  Downside: makes *customization difficult*
- outsourcing: some workload done by specialists outside the business (lower costs, more efficient)
- relocating: moving the entire production to another country (lower labour cost)
- downsizing: reducing capacity (i.e., lay off workers, close divisions). *Advantages* of this are:
  - cost savings $\rightarrow$ increased profit
  - more competitive operation
  - removes inefficiencies
  - no subsidisation required of unprofitable parts

  Downside: laying off $\rightarrow$ losing skills, experience, and knowledge. Lowers morale of staff.

Production, productivity and efficiency

Factors influencing efficiency

- delayering: reducing staff by removing layers of management. Advantages of delayering:
  - savings made from laying off expensive managers
  - better communication
  - better motivated staff if they have more reponsibilities
- investing in new technology: reduces inefficiency (new equipment)

Production, productivity and efficiency

★ Factors influencing efficiency

- lean production (PAST PAPERS):
  - approach developed by Toyota
  - aim: use fewer resources in production (use less of everything: factory space, materials, suppliers, labour, ...)
  - lean production:
    - raises production
    - reduces costs and cuts lead time
    - reduces number of defective products
    - improves reliability and speeds up production
- Kaizen: related to *lean production*
  - japanese for *continuous improvement*
  - idea: everything can be improved
  - workers come up with ideas to improve quality, reduce waste, ...
- Just-in-time production (JIT): minimize the amount of stock held by business

Production, productivity and efficiency

Distinction between labour and capital intensive production

- choice of combination between *labour intensive* and *capital intensive* techniques
- the *optimal resource mix* between these two factors depends on:
  - *nature* of the product (i.e., services are labour intensive)
  - *relative prices* of the two factors (i.e., if labour is more expensive this part may be outsourced)
  - *size* of firm: the larger the firm, the more capital intensive it is

Production, productivity and efficiency

Distinction between labour and capital intensive production

Capital intensive strategies
Benefits
• Generally more cost-effective if large quantities are produced
• Machinery is often more precise and consistent
• Machinery can operate 24/7
• Machinery is easier to manage than people
Drawbacks
• Huge set-up costs
• Huge delays and costs if machinery breaks down
• Can be inflexible – much machinery is highly specialised
• Often poses a threat to the workforce and could reduce morale
Labour intensive strategies
Benefits
• Generally more flexible than capital – can be retrained for example
• Cheaper for small-scale production
• Cheaper for large-scale production in countries like China and India
• People are creative and can therefore solve problems and make improvements
Drawbacks
• People are more difficult to manage than machines. They have feelings and react
• People can be unreliable. They may be sick or leave suddenly
• People cannot work without breaks and holidays
• People sometimes need to be motivated to improve performance

Production, productivity and efficiency

Case study: Jaguar and Rover

-
-
-

Production, productivity and efficiency

Key terms

- batch production:
- capital intensive:
- capital productivity:
- cell production:
- division of labour:
- downsizing:
- efficiency:
- flow production:
- job production:

Production, productivity and efficiency

Key terms

- Kaizen:
- labour intensive:
- labour productivity:
- lean production:
- outsourcing:
- production:
- productivity:
- specialisation:
- standardisation:

Capacity utilisation

- *capacity utilisation*: use that business makes of its resources
  - *full capacity*: not possible to increase output
  - *excess capacity*
  - *surplus capacity* (or unused capacity)
- businesses may decide not to be at full capacity (be *flexible*)

Capacity utilisation

Measuring capacity utilisation

- Formula for capacity ustilisation

$$\text{capacity utilisation} = \frac{\text{current output}}{\text{maximum possible output}} \tag{3}$$

- see *worked example*

Capacity utilisation

Implications of under-utilisation

- drawbacks: resources are not used *optimally* $\rightarrow$ unit costs are not minimised

Actual output (units)	120,000	160,000
Maximum possible output (units)	200,000	200,000
Capacity utilisation	60%	80%
Variable costs (£2 per unit)	£240,000	£320,000
Fixed costs	£50,000	£50,000
Total cost	£290,000	£370,000
Unit cost	£2.42	£2.31

- benefits: business will be able to cope with sudden increases in production (able to absorb workloads)

Capacity utilisation

Implications of over-utilisation

- drawbacks: can put stress on resources (i.e., turedness, stress, accidents, absences); inability to respond to increases in demand
- benefits: average cost will be low, better prices and competitiveness

Capacity utilisation

Ways of improving capacity utilisation

- reduce capacity:
- increase sales:
- increase usage:
- outsourcing:
- redeployment:

Capacity utilisation

Case study: Enfield Shipping ltd.

-
-
-

Capacity utilisation

Key terms

- capacity utilisation:
- excess or surplus capacity:
- full capacity:
- mothballing:
- over-utilisation:
- rationalisation:
- under-utilisation: