

# UNIT 3 – FIRMS AND DECISIONS I NOTES

## 1. OBJECTIVES OF FIRMS

- Profit maximisation; revenue; profit sacrificing; market share dominance

### 1.1 PROFIT MAXIMISING OBJECTIVE

$$\pi = TR - TC$$

- Theory of firm assumes that firms aim to maximise profits in the short run
  - Profits made through earning more from sale of goods than cost of production
- Why? seek to maximise profit to have best chance of surviving in a competitive environment
  - Entrepreneurs receive income from firms in form of dividends, higher profits, higher incomes
  - Larger firms able to reinvest profits into research and development activities
- Scarce resources – firms decide [aim: to yield highest level of profits]
  - What goods and services to produce
  - How to produce these goods and services (method of production)

### Economic profit

<b>Supernormal profit</b> – positive economic profit	TR > TC   AR > AC
<b>Normal profit</b> – 0 economic profit	TR = TC   AR = AC
<b>Subnormal profit</b> – negative economic profit (loss)	TR < TC   AR < AC

### Marginalist Principle in Determining Profit Maximising Output and Price

- Firms maximise profits at output where marginal revenue equals marginal cost

Output (Q)	Price (=AR)	TR	MR	TC	ATC	MC	$\pi=TR-TC$	MR vs. MC
0	14	0	-	2	-	-	-2	-
1	12	12	12	6	6	4	6	MR>MC
2	10	20	8	8	4	2	12	MR>MC
3	8	24	4	12	4	4	12	MR=MC
4	6	24	0	20	5	8	4	MR<MC

### Decision

Firm will choose to produce 3 units of output (MR = MC) and gain \$12 in profit

- Law of Demand – as price falls, QD increases
  - Total revenue –  $TR = P \times Q$
  - Average total cost –  $ATC = \frac{TC}{Q}$
- **Marginal revenue** is additional revenue a firm makes from selling one more unit of output produced
  - $MR = \frac{\Delta TR}{\Delta Q}$
- **Marginal cost** is the additional cost a firm incurs from increasing output produced by one unit
  - $MC = \frac{\Delta TC}{\Delta Q}$

### Determining profit maximisation output – consider whether an extra unit of output should be produced

- **MR > MC** – additional revenue obtained greater than additional cost of output produced
  - Higher profit gained by increasing output
- **MC > MR** – additional revenue received less than additional cost incurred
  - Should cut back on its output produced to increase profits

### Limitations of Traditional Theory of Profit Maximisation

- Unrealistic – firms 1. Wish to maximise profits but X able 2. Have other aims (X profit maximisation)
- Why firms are unable to maximise profits despite wishing to do so?

<b>1. Lack sufficient or accurate information about demand and cost conditions that exist</b>
• <b>MR difficult to compute</b> due to <u>difficulty in estimating QD</u> by consumers at <u>different prices</u> <ul style="list-style-type: none"> <li>◦ Pricing decisions made based on firms' evaluation of <u>estimated demand</u> for good/service rather than based on <u>precise information on actual demand</u></li> </ul>
• Firms tend to <u>work on basis of explicit costs</u> instead of economic cost
• Result – X use MC & MR concepts for P & Q decisions; true profit only <u>maximised by chance</u>
<b>2. Significantly high cost to obtain sufficient information to make profit maximising decisions (some cases)</b>
• Reasons for high cost – several production locations (international), multiple product offerings
<b>3. Problems with deciding time period to maximise profits</b>
• Why? firms operate in <u>dynamic environment</u> (demand & cost conditions change) <ul style="list-style-type: none"> <li>◦ Arise from actions of firms and others outside of their control (non-price determinants of demand and actions of other firms)</li> </ul>
• Result – firms X faced with <u>static cost and revenue curves</u> to read off profit-maximising Q and P

## **Reasons why profit maximisation assumption is reasonable**

- Assumption makes it possible to arrive at useful predictions regarding their behaviour
- Firm's long-term survival hinges on firm's ability to generate profits; reasonable assumption in analysis of firm's behaviour

## **1.2 ALTERNATIVE OBJECTIVES OF FIRMS**

- Why firms chose to focus on achieving other objectives? There are different groups of decision-makers; each group has a different objective when making decisions

### **→ Revenue maximisation**

- What? [TR = P x Q]; How? Total revenue is maximised at output where no additional revenue can be reaped from producing and selling one extra unit of output ( $MR = 0$ )

### Features of a complex modern economy

- People (principals) employ others (agents) to carry out specialised tasks
  - Firms employ consultants for advice/engage services of specialist firms (advertising agency)
  - Similarly – employees of a company are agents of their employer
- As a firm grows in size, organisation of companies results in separation of ownership from control
  - Ownership – hands of shareholders; control of day-to-day operations – directors/managers
  - Result – **principal-agent problem**

Principal-agent problem – objectives of shareholders (principal) which is profit maximisation differs from that of directors and managers (agents)

- Principal/shareholders –  $\pi$  max., strong returns in form of dividend payments and rising share price
- Managers – other objectives such as power, bonuses, large expense accounts, prestige and status
  - In their self-interest, they **maximise managerial utility**

### Managerial utility – ex. theory of sales revenue/total revenue of maximisation

- Income of sales managers and commission-based employees largely dependent on firm's TR
- Higher TR generated, greater commission; result:
  - Firms with dominant sales department choose to maximise revenue rather than profits
  - Extra profit generated spent on advertising to increase revenue further

### **→ Profit satisficing**

- Satisficing behaviour occurs when firms aim for minimum acceptable levels of revenue and profit
  - What? pursue minimum satisfactory condition/outcome; sacrifice profits for other aims

### Maximisers vs satisficers

- Maximisers – behave in traditional economic way; make the best possible choice from available alternatives
  - Takes time, energy and resources
- Satisficers – examine limited set of alternatives; choose best between them
  - Why? aiming for optimal solution necessitates needless expenditure of time, energy & resources; allows manager to enjoy other benefits (staff welfare)

<b>MAXIMISERS</b>	<b>SATISFICERS</b>
Requires <b>full information</b> regarding cost and revenue conditions	Requires <b>some information</b> regarding cost and revenue conditions
Must be aware of <b>all possible alternatives</b> to achieve maximum profit	Is aware only of a <b>limited set of alternatives</b> to generate profit
<b>MAXIMUM PROFIT ACHIEVED</b>	<b>SATISFACTORY LEVEL OF PROFIT (DEEMED ACCEPTABLE BY SHAREHOLDERS) ACHIEVED</b>

How profit satisficing comes about – divorce of ownership from control; principal-agent problem

- **Divorce of ownership of control:** shareholders (primarily interested in maximising profits) are removed from operations of firms to be fully aware of optimal decisions to maximise profits
- **Principal-agent problem:** Managers aim for target level of profit over absolute maximum level
  - Decide against decisions when they do not stand to benefit
  - Achieve given level of profits deemed acceptable by shareholders but below  $\pi$ -max. level, enjoy other benefits (shorter operating hours, lower levels of stress)
- Actions congruent with argument that provided satisfactory levels of profits are achieved, managers have the discretion to pursue their own interests and maximise managerial utility

## → Market share dominance

- What? Market share – proportion of firm's total sales (revenue)/(vis-à-vis) total market revenue
- Why? attract better talent, keep out competition and make higher long-term profits
  - Firms with larger market share attract better talent
    - Employees prefer working for bigger firms due to greater prestige & higher salaries
  - Managers and executives: gains and losses in market share correlate with stock performance

### How firms increase market share through influencing demand/revenue

- Reducing prices – subject to making normal profits in long run
- Engaging in strategies to shift demand curve outwards and less price elastic
  - Why? enable firms to raise prices, increase total revenue and profit, ceteris paribus
- Strategies employed to deter entry & increase market share are similar, but X same target groups
  - Entry deterrence – focused on potential rivals
  - Predatory prices – centre on incumbent firms

#### 1. Entry deterrence

- If firm in industry earns supernormal profits, likely to be potential entrants → successful entrants lower market share and profits (possibly) for incumbent firm
- Firms focus on price & non-pricing decisions to deter entry of new firms, avoid losing market share
  - Product differentiation through brand proliferation (investment in developing new products; marketing & advertising to reinforce consumer/brand loyalty)
- New entrants reconsider entry; have to match significant amount spent on advertising/promotion

#### 2. Predatory pricing

- What? Engage in predatory pricing: goods below  $\pi$ -maximising price to attract more consumers
  - (sometimes) Price set lower than average variable cost of production (OCED)
- Short run – incumbent firm likely to earn subnormal profits
  - Able to do so due to sufficient past profits to cope with losses incurred in the process
- Long run – rivals X cope with short-term losses incurred to match low prices, choose to exit market
  - Allow remaining firms to increase their market share and market power

## 1.3 CONCLUSION – why businesses may not pursue profit-maximisation

- Large businesses are complex organisation made up of different stakeholders with different objectives/goals that may be conflicting → single theory based on restrictive assumptions X account for many forces on the formulation of a firm's price and output decision
  - Dominant group – focus on their own objectives
  - Managers: P & Q decisions at the local level
  - Shareholders: distant view of company's performance and strategy
- Firms X profit in early stages of existence (especially for technology start-ups)
  - Skype (est. 2003) – operating at \$7M loss when filed for IPO (2012)
  - Twitter – valued at \$18B at IPO (Nov 2013); loss of ~\$80M in 2012
- **Profit-maximisation** is a relevant long run objective; may not be possible in short run
  - Short run – preferable to run at a loss, aim for revenue maximisation, establish brand presence and aim for growing market share
  - Recessions – X best time to pursue profit maximisation
- Firms may sacrifice profits in short term to increase profits in long run
  - Strategies are ultimately short run subsets of long run profit maximisation
  - Ex. heavy investment in R&D; firms make less supernormal profits/subnormal profits in short run due to higher costs; but successful R&D may enable higher profits in future
  - Ex. strategies aimed at deterring entry and increasing market share
- Firms X facing competition have little/no incentive to maximise profits (vs high competition markets)
  - Luxury of being able to wait for deferred long run profits may only be the preserve of established multinationals

## SECTION SUMMARY

- Profit – difference between total revenue (TR) and total cost (TC)
  - Maximised when marginal revenue (MR) is equal to marginal cost (MC)
- Firms use marginalist principle when making decisions, weighing marginal cost and marginal revenue
- Most firms aim to profit maximise; but it may be difficult to do so in reality
- Besides profit maximisation, firms have various other objectives
  - Revenue maximisation, profit satisficing, market share dominance (entry deterrence)
- Ultimate aim of firms depends largely on dominant stakeholder, their stage of development and prevailing market conditions

## Learning objectives

- Explain what is meant to profit-max, revenue-max, profit satisfice and growth-max
- Explain reasons for different objectives of the firms

## 2. SHORT RUN PRODUCTION AND COSTS

### 2.1 INTRODUCTION

#### Definitions

- **Market** – exists when producers & consumers come together to transact with each other (**D/S**)
- **Firm** – organisation/enterprise formed by entrepreneurs who bring together factors of production (land, labour, capital, entrepreneurship) to produce goods/services for sale
- **Industry** – a group of firms that produce a single good/service/group of related goods & services
  - Ex. Smartphone (Samsung, Apple, Huawei); Fast food (McDonald's, KFC)

#### Production Function

$$\text{Total product} = f(\text{land, labour, capital, entrepreneurship})$$

- Production – process by which factors of production are used to create goods and services
- Production function – shows relationship between output of a good/service and its FOPs for a given level of technology within a specific period of time; shows how output/produce is affected by changes in quantity of one or more FOPs

#### Short and long run production

- Firms needs to acquire greater quantities of FOPs to increase production; may X possible immediately
- Variable factors – the only quantities of inputs firms are able to increase in the short run
  - Ex. raw materials, fuel, tools, labour (possibly)
  - Ex. hiring more flight crew, use more fuel to meet rising demand in increased no. of flights (Q)
- Fixed factors – not able to change immediately in the short run
  - Ex. existing buildings, machinery
  - Ex. airline can increase fixed factors (purchasing more airplanes) to meet rising demand

#### Short-run vs long-run production

- Short-run – time period during which at least ONE factor of production is fixed
  - Law of diminishing marginal returns (production subject to cost)
  - Output can increase only be using more variable factors
  - Note – actual length of short run differs between firms and industries, X a fixed period of time
- Long-run – time period long enough for all FOPs/inputs to be varied, except level of technology
  - Law of returns to scale, economies of scale (production subject to cost)

#### Accounting and economic cost

**Economic cost** – measure of total opportunity cost of using scarce resources to produce one particularly commodity in terms of the next best alternative foregone

$$\text{Total economic cost} = \text{explicit cost} + \text{implicit cost}$$

- **Explicit costs** – factors not owned by the firm; payments made to outside suppliers of input
  - Ex. salaries, employee wages, raw materials prices, overhead costs (rent, annual maintenance, fire insurance)
- **Implicit costs** – factors owned by firm; costs that X involve direct payment of money to 3<sup>rd</sup> party, but involve a sacrifice of some alternative; tend to be difficult to estimate/calculate in reality
  - Ex. salary entrepreneur could earn from working his next best alternative job/interest foregone on funds supplied by business owners

## 2.2 SHORT RUN PRODUCTION – subject to law of diminishing marginal returns (LDMR)

- **LDMR** – as more variable factor units (labour) are applied to given quantity of fixed factor (machinery), comes a point where additional output from additional variable factor units employed diminish
- Production in the short run goes through 3 stages

### Stage 1 – total output rises (total product rises), increasing marginal output

- Increasing marginal output (marginal product of labour rises), total output rises at an increasing rate
  - Marginal product – extra output produced by employing one more unit of a variable factor
- Why? more efficient labour-capital combination; more workers, fixed capital used more effectively
  - Division of labour and specialisation of tasks lead to greater efficiency
  - Efficiency rises with each additional worker employed
- Ex. bakery with fixed quantity of machines, decisions only made on no. of workers to employ
  - First 2 workers employed, no. of bread loaves initially rises more rapidly (only one worker, low efficiency since worker manages all tasks; one more worker, each worker specialises in specific task, use available resources more efficiently)

### Stage 2 – total output rises, decreasing marginal output

- Decreasing marginal output (marginal product of labour falls), total output rises at decreasing rate
- Why? inefficient labour-capital combination; overcrowding arises, fixed factor over-utilised
  - Where LDMR sets in where marginal product of labour starts to fall
  - Each additional unit of labour adds less to total output than previous; marginal output falls
- Ex. 3<sup>rd</sup> worker employed, total output rises, but marginal product falls
  - Why? insufficient space/limited machines at bakery; 3<sup>rd</sup> worker contributes to production process by smaller extent compared to previous workers; similar for 4<sup>th</sup>/5<sup>th</sup>/6<sup>th</sup> worker

### Stage 3 – total output falls, marginal product of labour is negative

- Additional output attributable to next unit of variable factor is negative
  - Ex. more workers employed; MP becomes negative as they get in one another's way
- How to expand production? Increase in quantity of fixed factor (long-run)
  - Ex. build an additional factory, increase size of existing factor (increase no. of machines)

## 2.3 SHORT RUN COSTS – firm X vary fixed factors; varies output by varying amount of variable factors

### Fixed and variable costs

- **Fixed cost** – costs that does not vary with output level; paid when production does not take place
  - Ex. rent, fire insurance, paint for factory walls
- **Variable cost** – costs that varies with output level; not incurred when production does not take place
  - Ex. cost of raw materials, hourly wages

### Total costs, average costs, marginal costs

Term	Definition	Mathematical Representation
Total cost (TC)	Sum of costs of all the factors of production a firm uses in production	$TC = TFC + TVC$
Total fixed cost (TFC)	Cost incurred in utilisation of fixed factors of production	
Total variable cost (TVC)	Cost incurred in utilisation of variable factors of production	
Average (total) cost (AC)	Cost per unit of output	$AC = TC / Q \mid AC = AFC + AVC$
Average fixed cost (AFC)	Total fixed cost per unit of output	$AFC = TFC/Q$
Average variable cost (AVC)	Total variable cost per unit of output	$AVC = TVC/Q$
Marginal cost (MC)	Change in total costs from increasing output by one additional unit	$MC_n = TC_n - TC_{n-1}$ $MC = \Delta TC / \Delta Q$

### Numerical costs (X tested) – bakery utilises machines (fixed) and workers (variable) in production of bread

Fixed Factor	VF	O/P (Q)	MP	TFC	TVC	TC	AFC	AVC	ATC	MC
1	0	0	0	20	0	20	-	-	-	-
1	1	4	4	20	25	45	5.0	6.3	11.3	6.3
1	2	10	6	20	50	70	2.0	5.0	7.0	4.2
1	3	14	4	20	75	95	1.4	5.4	6.8	6.3
1	4	17	3	20	100	120	1.2	5.9	7.1	8.3
1	5	19	2	20	125	145	1.1	6.6	7.6	12.5
1	6	20	1	20	150	170	1.0	7.5	8.5	25

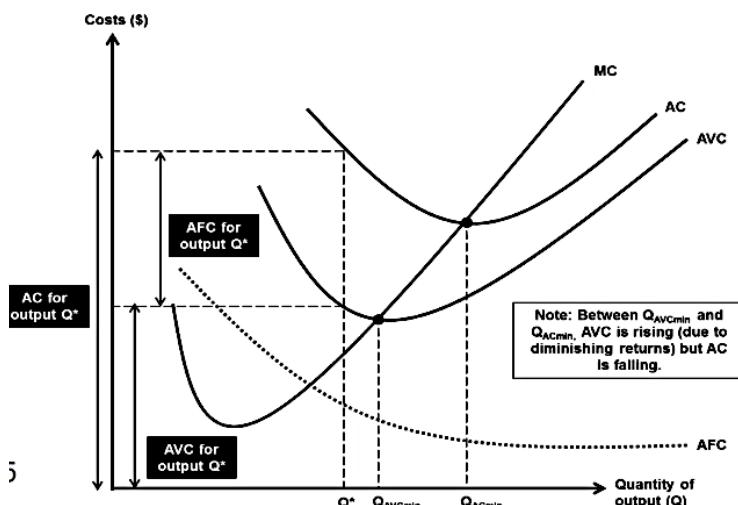
Short run – firm has in its possession

- 1 unit of machine costs \$20
- Hire workers by paying \$25 for each worker
- Average costs = total costs/Q | MC =  $\Delta TC / \Delta Q$

## 2.4 SHORT RUN COST CURVES – not expected to illustrate curves with numerical figures; sketch will do

### Individual components of short run cost curves

- AFC curve is continuously downward sloping; AFC falls as total output increases
  - TFC is constant regardless of level of output; AFC falls as total output increases
  - As output rises, TFC is spread over larger quantities of output, AFC decreases
- TVC initially increases at decreasing rate but eventually increases at an increasing rate due to LDMR
  - TVC increases as output increases as more variable inputs are used to produce more output, holding price of variable inputs constant
- MC curve is U-shaped; MC initially falls than rises as output increases
  - MC – change in TVC between one unit and previous unit
  - MC initially decreases as production experiences increasing marginal returns (rising MP)
    - Why? more efficient labour-capital combination and/or better utilisation of fixed factors; same cost of variable FOP, initial fall in MC due to increase in output
  - MC subsequently increases as production experiences decreasing marginal returns (falling MP)
    - Why? diminishing returns from fixed factors becoming overly-utilised; same cost of variable FOP, each unit adds fewer units of output to production, MC rises
  - Note – LDMR is a short-run concept; diminishing returns set in when MC starts to rise
- AVC curve is U-shaped; AVC initially falls then increases as output increases
  - Rise in MC due to law of diminishing marginal returns causes AVC to eventually rise
  - Note – AVC starts to rise only after MC rises above AVC due to mathematical relationship between marginal and average values



### Relationship between MC and AVC/ATC curves

- TVC increases to produce additional units of output in the short-run
  - TC rises ( $TC = TFC + TVC$ ); MC rises

### Mathematical relationship between MC, AVC and ATC

- When **MC < AC**: AC falls as additional units of output cost less than average, production pulls AC down
- When **MC > AC**: AC rises as new units of output cost more than average
- When **MC = AVC** and AC intersect, AVC and AC = **minimum**

### Relationship between AFC, AVC and ATC curves

- $ATC = AFC + AVC$  [note – ATC curve commonly denoted as AC]
  - Shape of ATC determined by vertical summation of AFC and AVC
- ATC decreases initially as AFC and AVC decreases
- ATC continues to fall even as AVC subsequently increases, while AFC continues to decrease
  - Why? decreasing effects of AFC outweighs increasing effects of AVC
- ATC eventually increases
  - Why? increasing effects of AVC outweighs decreasing effects of AFC
  - As AFC continues to fall with increases in Q, vertical distance between ATC and AVC decreases as Q increases (vertical distance between ATC and AVC represents AFC)

### SECTION SUMMARY

- Important to distinguish between fixed and variable costs in the short run
  - Changes in fixed and variable costs have different effects on MC, AC and AVC
- Sketch cost curves over plotting them; no need to memorize exact numerical values
- MC, AC and AVC curves are often used in economic analysis regarding the short run
  - AFC usually derived from subtracting AVC from AC

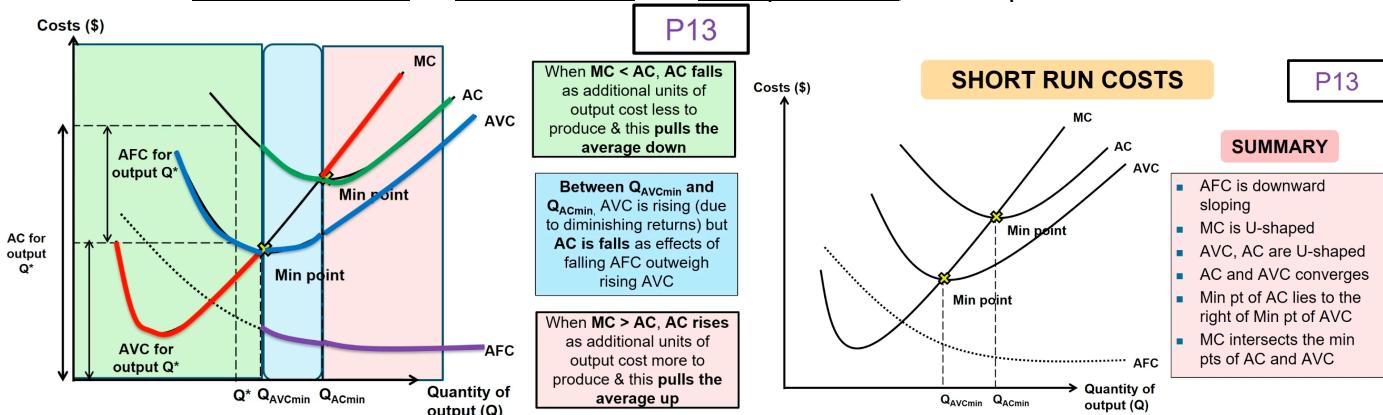
## 2.5 DECISION MAKING IN THE SHORT RUN – at least one factor is fixed in supply

### Short-run shut-down conditions

- Fixed costs have no bearing on firm's short run decision making
  - Have to be paid even if the firm is not producing
- Variable costs are significant in determining short-run pricing and output decisions
  - Firm continues to produce if able to cover variable cost; otherwise, production will shut down

### Strategy to increase profits (of a profit-maximising firm) – reduce cost of production

- Lower fixed costs in the new short-run
  - Fixed costs change, MC unaffected (additional cost of producing extra unit of good unchanged)  
→ P and Q X change; ATC falls → lower costs, firm's total profit increases ceteris paribus
  - Ex. rental costs increasing, look for new location with relatively cheaper rent
- Source for cheaper variable inputs, lower cost of production in new short-run time
  - However, when VC changes (wage rise), both MC and ATC rise
  - When MC changes, firm pass on some cost changes to consumer → profit-maximising price increases, Q falls → ATC increases and total profits fall, ceteris paribus



## 3. LONG RUN PRODUCTION AND COSTS

### 3.1 LONG RUN PRODUCTION [law of returns to scale]

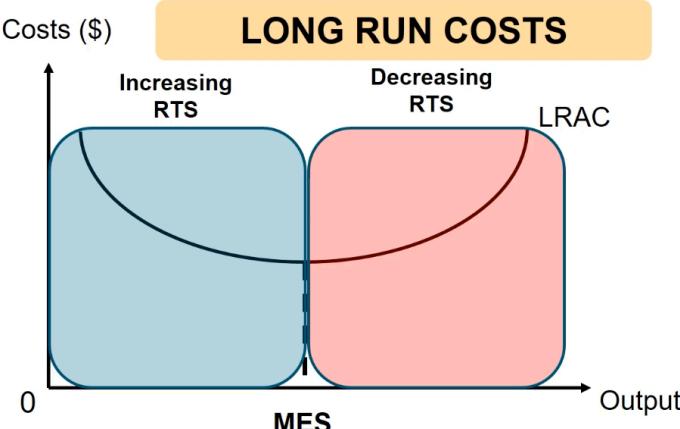
- Long-run – time period where all factors of production can be varied, except for level of technology
- Firms may consider scale of production [note: to scale means all inputs increase by same proportion]
  - Assuming labour cost, capital and state of technology are constant, different scales of production have implications for long-run production

### Three possible scenarios when scale of production increases

- |  |
|--|
| 1. Constant returns to scale – output increases <u>proportionately</u> to increase in inputs <ul style="list-style-type: none"> <li>• Ex. all inputs increased by 8%, output increases by same percentage (8%)</li> </ul>  |
| 2. Decreasing returns to scale – output increases <u>less than proportionately</u> to increase in inputs <ul style="list-style-type: none"> <li>• <u>Internal diseconomies of scale</u> present; represented by <u>rising section of LRAC</u></li> <li>• Ex. all inputs increased by 8%, output only increases by 5%</li> </ul>                            |
| 3. Increasing returns to scale – output increases <u>more than proportionately</u> to increase in inputs <ul style="list-style-type: none"> <li>• Implies average cost falls as output increases; firm reaps <u>internal economies of scale</u></li> <li>• Ex. all inputs increased by 8%, output increases by more than proportionately to 20%</li> </ul> |

### 3.2 LONG RUN COSTS – all factor inputs can be varied; no long-run fixed costs (all costs are variable costs)

**Long run average cost curve (LRAC) curve** shows how average cost varies with output; typically U-shaped



#### Interpreting the LRAC curve

##### Increasing relationship

- As output rises, average costs fall initially (output rises faster than inputs)
- Why? firms benefit from internal economies of scale (EOS)

##### LRAC at its minimum

- Firm reached its **minimum efficient scale**
- LRAC stops falling; optimal output level where no significant/additional internal economies of scale can be achieved

##### Decreasing relationship

- As output rises, average cost rises (output rises slower than inputs)
- Why? internal diseconomies of scale (DisEOS)

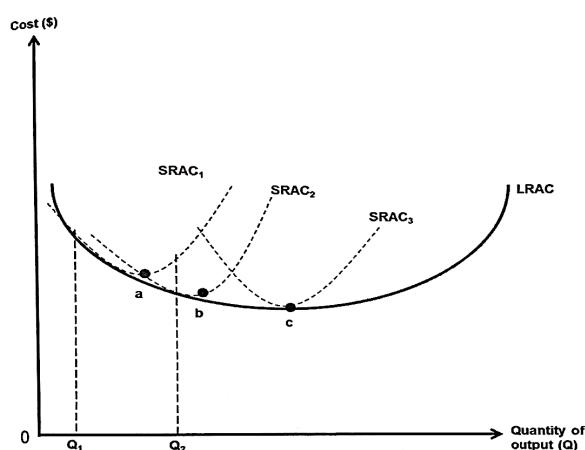
##### All points on LRAC

- Represent least-cost factor combinations for given level of output
- Points above LRAC – attainable but unwise
- Points below LRAC – unattainable given present factors of production and level of technology

Note – some firms have continuously falling LRAC curves (natural monopolies, ex. utilities)

- Economies of scale enjoyed over an extremely large output
- Especial for firms with significantly high start-up costs

#### Relationship between SRAC and LRAC



- LRAC (firm's planning curve) – firms decide size and scale of its plant (land, building, factories, heavy machinery) to produce a given level of output at lowest possible cost
- Succession of infinite SRAC curves constructs a LRAC curve enveloping the SRAC curves
  - At any output level, LRAC curve is tangent to each of the SRAC curves
  - Represents lowest possible AC at each level of output if all resources are variable in LR
- Point of tangency between LRAC and SRAC X occur at minimum points of SRAC curves
  - Exception – point where minimum efficient scale (MES) is achieved

Ex. farmer with 2 inputs – land and labour; wish to expand production, considers long-run options

- Each farm size with fixed input of land represented by SRAC<sub>1</sub>, SRAC<sub>2</sub>, SRAC<sub>3</sub>
- Initially producing at Q<sub>1</sub> on SRAC<sub>1</sub> wants to increase production to Q<sub>2</sub>; 2 options
  - Retain current farm size; remain on SRAC<sub>1</sub> in short run
  - Increase size of farm, produce on SRAC<sub>2</sub>; produce Q<sub>2</sub> at lower average cost (cost benefits arising from economies of scale)
- Possible only to produce at lowest possible cost on SRAC<sub>1</sub> up to point a (minimum point)
  - Farmer should consider increasing size of farm (long-run), move onto SRAC<sub>2</sub>
  - If farm size increases + move to SRAC<sub>2</sub>, output increases to lowest possible cost until point b
  - Beyond b, farmer should increase farm size, switch to SRAC<sub>3</sub>

## **Internal economies and diseconomies of scale**

- Measured in terms of a firm's costs of production
- Concerned with how average cost of production changes as scale of production increases

### Internal economies of scale – represented by falling part of LRAC curve

- Cost savings occurring as a result of firm's expansion/increasing scale of production
- Created by firm's own policies and actions; as output increases, AC falls

### **→ Technical economies of scale – gains in productivity/efficiency from scaling up production**

#### Factor indivisibility – some inputs of a minimum size cannot be divided into smaller units (indivisible)

- Purchasing such FOPs X feasible if firm's output is small/operating below factor's maximum capacity; small output level → high AC; high output level → lower AC, overhead costs spread out
- Ex. supermarket invest in database technology to improve stock control, reduce transportation & distribution costs; X economical for smaller grocer
- Ex. mining & agricultural industry, heavy equipment (drills, excavators, harvesters) significantly improve output, reduce AC; bought only by large firms to spread equipment cost over a larger output

#### Law of increased dimensions (container principle) [ex. blast furnace, oil tanker]

- Larger size of capital equipment used to contain materials, lower cost per unit output (lower COP)
  - Cubic law: doubling height & width, more than proportionate increase in cubic capacity
  - Output increased by greater extent than cost of producing, AC falls
- Ex. shipping companies: greater increase in capacity, AC of containing/transporting goods fall as scale increases; warehouse & distribution: larger land plot, bigger warehouse, enjoy lower unit COP; Amazon invested in several huge warehouses at central distribution points, store thousands of items

#### Specialisation & division of labour – workers assigned to do specific and more repetitive jobs

- Less training needed; workers more efficient in particular job, less time lost in switching from one operation to another; workers equipped with specific skills employed in specific areas, focus solely on each task, higher output per worker, gain in productivity helps to lower unit COP for firm
  - Principle applies to any mass production technique
- Lower output: less room for specialisation, higher AC; higher output: more room for " lower AC
- Ex. car manufacturing: each worker involved in particular phase of car assembly (installing car's transmission, electrical wiring system, paintwork); soda factory: in charge of narrow part of production process (processing raw materials – water/sugar; carbonation, bottling/canning)

### **→ Financial economies of scale**

- Larger firms: lower interest rates/larger loans due to better credit ratings and greater collateral, interest payments spread across higher output, lower average cost of borrowing
- Smaller firms (new start-ups/SMEs), higher interest rates on loans (banks find it riskier), interest payments spread across lower output, higher average costs
- Large firms tend to be public limited companies, raise capital more easily through insurance bonds (debt securities issued by borrowers firms seeking to raise funds from financial markets) to public
  - Consequently better able to take advantage of financial economies of scale

### **→ Managerial economies of scale – supervising, communicating, coaching**

- Specialisation & division of labour: supervisory level, increases productivity by training employees in specific step of production process [related to managerial economies of scale]
- Managerial: increases productivity by employing specialists to supervise production systems
  - Better management + higher investment in training managers + use of specialist equipment (networked computers), improve communication, raise productivity, reduce unit costs
- Extend to human resources management
  - HR specialists create efficient + cost-effective hiring and labour search processes → raise productivity and reduce unit costs
- Lower output, less specialisation, higher AC; higher output, more specialisation, lower AC

### **→ Marketing economies of scale – large scale buying and selling give firm important savings in cost**

- Bargaining advantage: buy raw materials and components in bulk, accorded preferential treatment by suppliers, dictate requirements of price, quality and delivery more effectively

- Selling economies – bulk advertising & large-scale promotion, higher output, cost spread over large volume of sales, lower AC
- Ex. Amazon: huge buying power in publishing industry, 30% share of physical book market in US, > 60% eBooks → use power to reduce prices it pays publishers for books sold on Amazon website

→ **Risk-bearing economies of scale** – spread COP uncertainty over large output level, reduce unit cost

- Spreading risk of research and development costs [innovation]
  - Returns from R&D highly variable and uncertain; large firms: easier to carry overheads of sophisticated R&D, spread R&D expenditure across greater volume of sales, reduce AC
  - Ex. pharmaceutical industry: R&D is crucial, but huge cost of discovering next blockbuster drug, several mergers between pharmaceutical companies were driven by companies' desire to spread R&D expenditure across greater volume of sales, reduce
- Wide variety of products, operate in many geographical locations to spread risk
  - Larger firms obtain FOPs from different sources, lowers AC (kept at competitive levels)
  - Ex. sharp hike in European factory wage cost mitigated by relatively cheaper COP in other countries'; large firms obtain materials from different sources, guard against crop failures & strikes causing spike in cost of raw materials

Internal diseconomies of scale – occurs beyond MES along upward sloping portion of LRAC curve

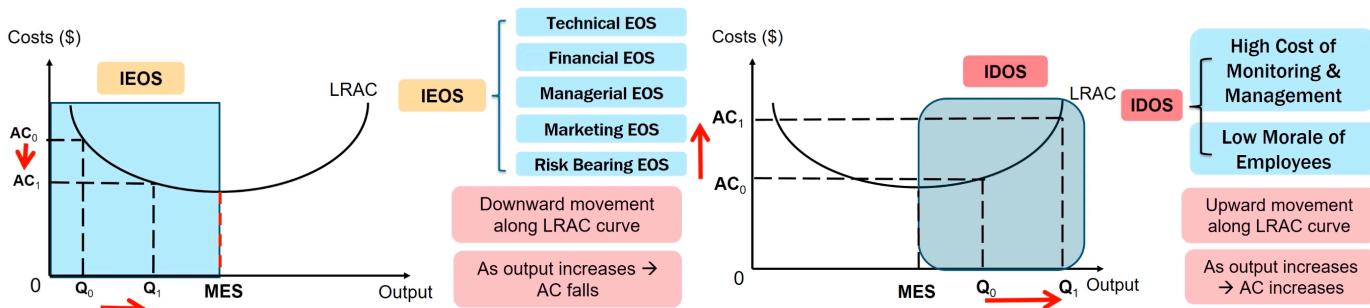
- Increases cost (particularly AC) that occur to a firm due to expansion of firm
- Result of firm's own policies and actions

→ **High cost of monitoring and management** – fall in efficiency, rise in AC

- **Monitoring** productivity and quality of output from thousands of employees in big complex corporations is imperfect and expensive
  - **Principal-agent problem**: difficulties of shareholders monitoring performance of managers
  - Monitoring costs increases as firm needs to monitor quality and ensure standardization
  - Ex. seek approval from layers of management to make changes in layout & express concerns, increase AC; transportation costs to travel between subsidiaries and headquarters, AC rises
- **Management problems** due to rigid organisation system, long chains of authority lead to
  - Co-ordination problems increase as firms become larger and more complex
  - Poor communication, difficult to maintain effective flow of information between departments, divisions, between head office and its subsidiaries (Starbucks, McDonalds)
  - Time lags in flow of information affect speed of response to changing market conditions
    - Ex. large supermarket chain less responsive to changing taste and preferences, incur more costs to make changes faster

→ **Low morale of employees** – when firms become too large, relationships tend to become impersonal

- Workers develop sense of alienation & loss of morale
  - Long-chain of authority in large firms, workers feel that they are 'only a small cog in a very large machine', do not consider themselves to be an integral part of the business, productivity fall, wastage of factor inputs, higher costs, rise in AC
- Relationship between management & employee important to maintain productivity and efficiency



**External economies and diseconomies of scale** – raises/lowers LRAC for all firms

External economies of scale – represented by downward shift of LRAC curve, AC falls for each level of output

- Savings in costs occurring to all firms due to expansion of industry/concentration of firms in 1 location

→ **Economies of information** – firms in an industry share common R&D knowledge and facilities

- Increase information flows on R&D processes, firms share information on cost-saving technologies
  - Improve productivity, cut down on unnecessary duplicates, reduce average costs
- Tap on research of universities nearby that are likely to tailor their research towards the industry
  - Scientific and trade journal published in the region provide information on new markets, sources of raw materials and latest techniques of production, improve productivity of firms

→ **Economies of concentration/agglomeration economies** – same location

- Agglomeration economies – result from clustering of businesses in a distinct geographical location
- Ex. software: Silicon Valley in State of California; SG's twin hubs of biomedical & engineering research: Biopolis and Fusionopolis

Availability of skilled labour

- Firms join together to develop training facilities for workers, reduce costs of trainings
  - Occurs when large demand for particular type of skill, special educational institutions set up to train people in such skills
- Well-known geographical location (Silicon Valley) attract talent for firms, reduce labour search cost
  - Ex. Amazon chose NYC as location for 2<sup>nd</sup> headquarters due to availability of high-skilled tech workers, firms incurs lower labour search costs

Well-developed infrastructure

- Gov. encouraged to invest in infrastructure catering to industry when firms concentrate in 1 area
  - Helps improve productivity, increases output per unit input, reduce AC for individual firms
  - Ex. better connected roads, railway lines, airports for transport of finished goods/raw materials, public utilities, commercial facilities to support larger work force

External diseconomies of scale – represented by upward shift of LRAC curve, AC rises for each level of output

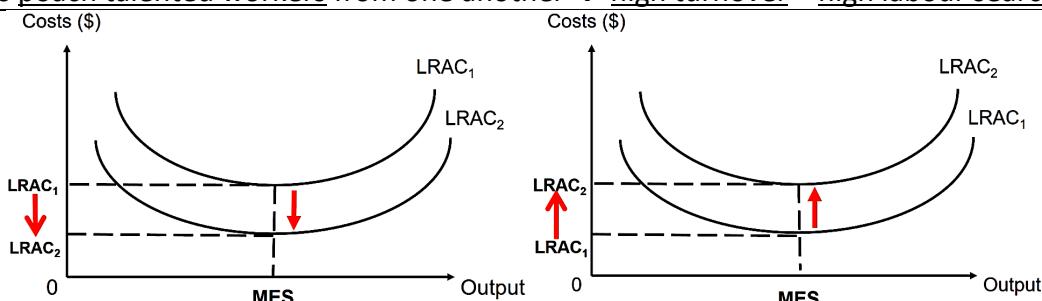
- Increases cost due to expansion of industry/concentration of firms in a certain location

→ **Increased strain on infrastructure**

- Localisation (concentration of firms) in one region and expansion of productive activities, infrastructure taxed to its limits
- Ex. traffic congestion, increased AC of production due to loss of time + increased fuel consumption

→ **Shortage of industry-specific resources**

- Industry grows larger, growing shortage of specific raw materials/skilled labour
  - Competition for such resources push up prices and increase firms' cost
  - Ex. increased demand for skilled engineers, rise in wage costs
- Firms poach talented workers from one another → high turnover + high labour search costs



## SECTION SUMMARY

- 2 types of EOS – internal (movement along LRAC) and external (shifting of LRAC)
  - Internal EOS/DOS – changes in LRAC due to expansion of firm caused by firm's own actions
  - External EOS/DOS – changes in LRAC for all firms due to expansion of industry
- Real world – various economies and diseconomies of scales exist; when asked on effects of scaling, explain benefits and costs of larger output to long run average costs (instead of just costs)
- Important to identify explicitly and elaborate on most relevant source (s) of EOS/DisEOS in given context
  - Better to elaborate on multiple unique sources of EOS or DisEOS rather than just one
- Illustrate effects diagrammatically

**Minimum efficient scale** – extent of EOS measured by firms' MES; most productive from society's POV

- Scale of production where all internal EOS have been fully exploited; lowest point on LRAC
- Output range over which a firm achieves productive efficiency

Relevance of MES – in relation to market demand: optimum size of firms + no. of firms in industry

- Strategic-decision-making with EOS, identifies level of scale required to enjoy optimal cost savings
  - Scale less than MES/more than MES – have a cost disadvantage
  - Some cases: lowest AC attainable over large range of output, MES is smallest level of output that can deliver the lowest cost
- Determined by nature of costs of production in specific industry [high start-up costs, larger firms]

**MES is small relative to market demand**

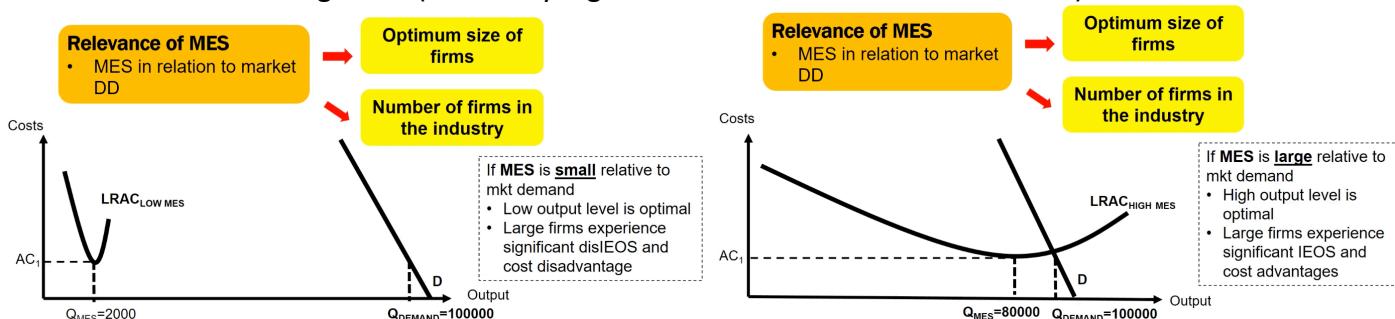
- Low output levels are optimal; large firms experience significant disIEOS and cost disadvantages
- Occurs when there are limited opportunities for EOS, MES achieved at low levels of output
- MES usually small % of market demand; market competitive with many firms achieving MES

**MES is large relative to market demand**

- High output levels are optimal; large firms experience significant EOS and cost advantages
- Occurs when high start-up costs, plenty of scope for reducing unit cost by increasing scale of output
- MES at high levels of output; market becomes less contestable, more highly concentrated [concentrated market structure: oligopoly, duopoly, monopoly]
  - EOS may act as barrier to entry as existing firms have achieved cost advantages

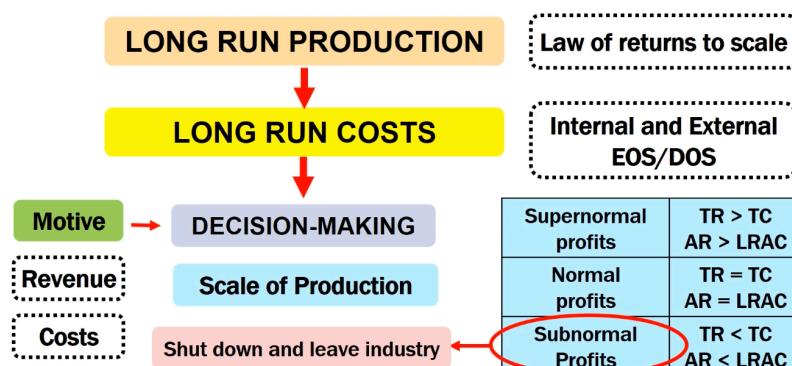
Example – firm in industry with  $Q_{MES} = 2000$ , market demand = 100 000 units

- Industry can accommodate 50 of such firms → more economic sense to have several firms/plants of MES over one large firm (incur very high costs due to diseconomies of scale)



**3.3 DECISION MAKING IN LONG RUN** – all factors are variable, except technology (assumed to be constant)

- Firm experiences constant, increasing or decreasing returns to scale
  - Cost affect firms' decision in LR (ex. increase scale of production)
  - Ex. firms with high start-up cost (telecommunications industry) choose to increase scale of production to reap internal economies of scale, lower long-run AC of production, movement along LRAC
- All factors can be increased/decreased in LR, but technology assumed to be constant
  - Technology improved, more output for given amount of FOP, LRAC fall, LRAC shifts downward
- If firms' average revenue is unable to cover its long-run average costs, earn at least normal profits, it will shut down by leaving the market



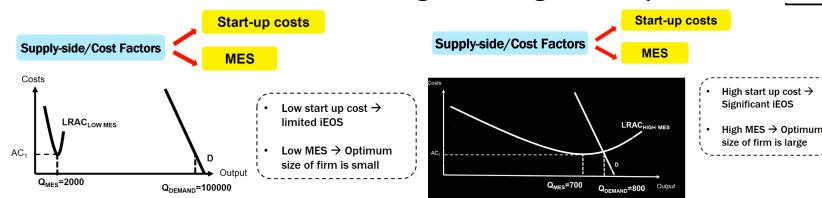
## 4. FACTOR AFFECTING SIZE OF FIRMS

- Several factors used to gauge size of firms – quantity of output sold, profits generated, total sales revenue, no. of employees, market share, no. of outlets
- Extent of EOS to individual suppliers + total size of market demands affects market structure
  - Concept of EOS seems to put large firms at cost advantage, but in many industries, possible for smaller firms to make a profit due to various demand and supply side reasons
  - Reasons why firms remain small/why small firms can survive/thrive/coexist with large firms

### 4.1 SUPPLY SIDE/COST FACTORS

→ Firms reach MES at very low levels of output relative to market output

- Diseconomies at low output levels of output, optimum size of firms in such industries is small
- Industries usually provide services requiring personal attention (tailoring, private clinics)
  - Average cost rises sharply as output increases; if specific detail is mass produced, diseconomies of scale sets in, advantages to large-scale production offset by disadvantages

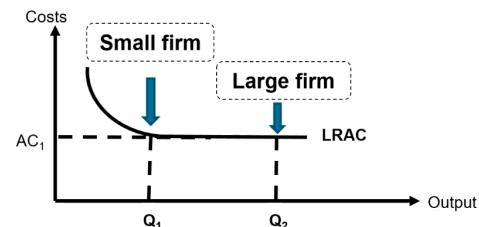


→ Vertical disintegration

- Small firms emerge when entire production process is broken up into a series of separate processes
  - Diseconomies of scale quickly emerge in each process → different small firms each perform a small part of the whole task to incur a lower unit cost
- Smaller firms complement larger firms in same industry if they specialise in a single process or make components for larger firms (ex. automobile industry: air conditioning units by small firms)

→ Saucer-shaped LRACs

- Small and large firms may co-exist due to cost reasons (some industries, ex. breweries)
  - When? likely when EOS are quickly exhausted; constant unit/AC over a wide range of output
  - LRAC is saucer-shaped with horizontal portion
- Possible for small and large firms to be equally cost-efficient and co-exist in same industry
  - Small firm producing output  $Q_1$  as cost competitive as large firm producing  $Q_2$



→ Banding & joint ventures – strategy involves cooperation among smaller firms to protect their interests

- Independent businesses engage in joint ventures/band together to gain advantages of bulk buying, advertising and promotion (cost advantages), while retaining their independence
  - Not the same as mergers as respective owners retain ownership of businesses
- Set up jointly owned enterprises to source for raw materials, obtain EOS enjoyed by larger firms

### 4.2 DEMAND SIDE/REVENUE FACTORS

- Firms remain small as market demand is limited; X able to support a large firm
- Small firms in some markets that favour large firms implement strategies that enable them to survive/thrive alongside larger firms, due to:

→ Nature of product – personalised goods and services

- Personalised goods and services require direct attention, impossible to mass produce
  - Ex. legal services by lawyers, specialised medical procedures by surgeons
- Repair and hairdressing service firms tend to be small; require personal attention to individual
  - Demand for firm's services is limited as good/service is very specific
- Consumers might have a preference for variety and choice over standardisation & mass production
  - Ex. ladies' fashion apparel and accessories

### → Market segmentation and specialisation

- Industry catering to diversified range of products and customers, **segmented** into smaller markets
- Large firms – focus on mass produced items; small firms – concentrate on customised items
  - Ex. Hondo/Toyota: cars for mass market; Porsche/Ferrari: more up-market sports cars
- Small firms cater to niche markets (i.e. limited market/demand)
  - Smaller due to high & restrictive prices (ex. expensive sports cars, luxury yachts, jewellery)
  - Market for specialised products tends to be smaller (ex. highly specialised machines/tools/ products of religious significance have limited markets)

Why niche markets survive – demand for goods are relatively more price-inelastic than in mass markets

- Though firms producing goods for niche markets X able to exploit fully available internal, they can set higher prices to cover its higher unit costs of production

### → Geographical factors

- Products with great bulk in relation to value, high transport costs relative to total production costs
  - Market for good likely to be local rather than national
- Perishables (fruits) have small & localised markets, transported over limited geographical region
- Small provision shops at convenient areas within inaccessible locations containing a smaller market
  - Despite higher average costs due to small scale, ✓ compete with huge supermarket chains

### → Profit-cycle – new products appear and disappear continuously

- Early stage of product cycle, low total demand for product, firms tend to be small → takes time to grow, outpace rival firms, merge or force others out of business

## 4.3 BUSINESS RISK & UNCERTAINTY – unwillingness to take greater risk (lack of information on demand)

### → Unwillingness to bear significant risks involved

- Expansion and large-scale production require funds and larger capital outlay
- If firms X able to raise money, need to borrow from banks, risk of investment greater, losses potentially greater if business X work out

### → Poor prospects of a larger market

- Firms fear future fall in final product's price; sudden expansion of output, large increase in supply, huge surplus, decrease in price; prospects of lower prices & profits prevent firms from expanding

## 4.4 ALTERNATIVE OBJECTIVES OF FIRMS – profit satisficing

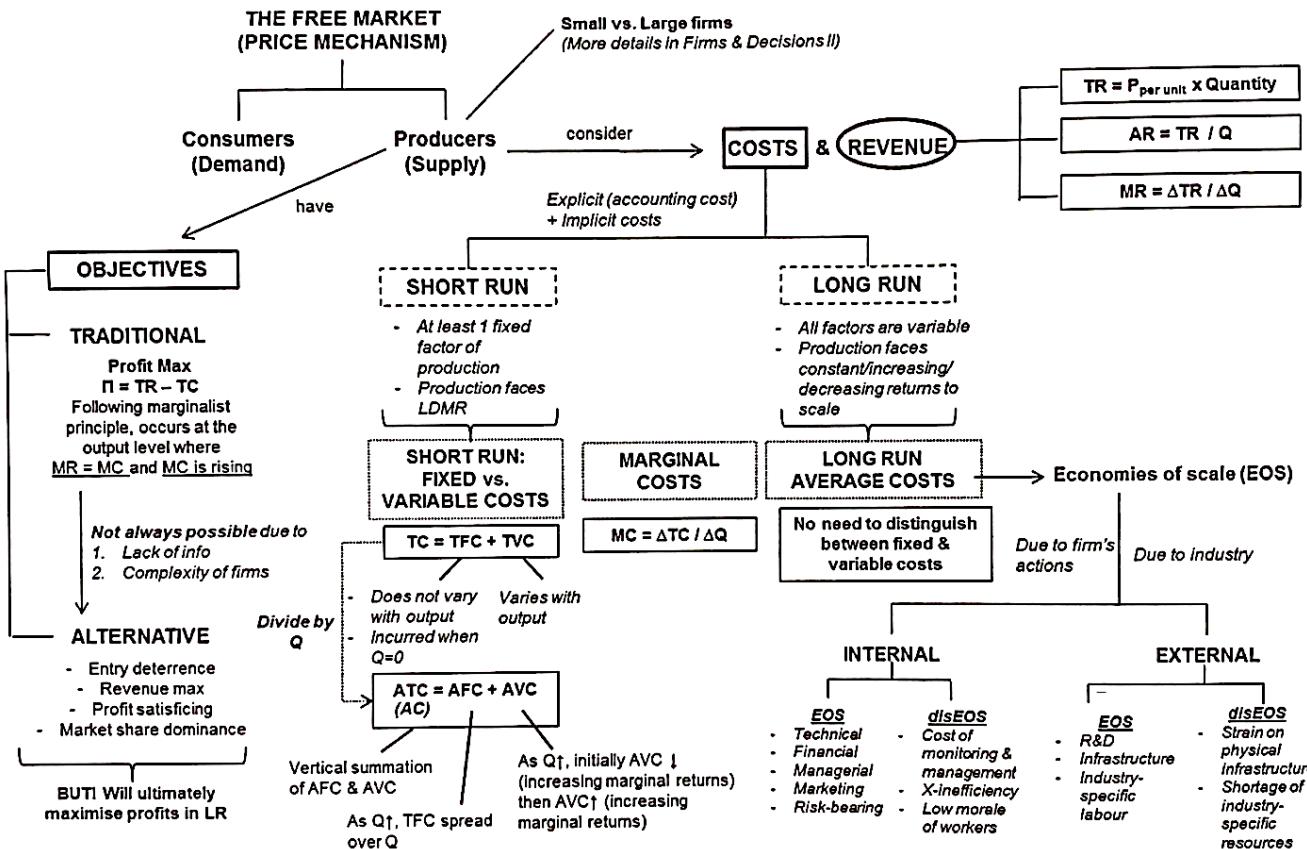
- Some firms remain small as owners prefer to keep them small for reasons unrelated to profit motive

### Entrepreneur contented with reasonable income from domestic/localised market

- Unwilling to take increased risks, stress, or perceived challenges from growth
- Decide to achieve a given level of profits (at lower output) deemed acceptable despite being under profit-maximising level; enjoy other benefits (shorter operating hours, lower levels of stress)

### Real world – large and small firms co-exist in the same industry [ex. retail furniture market]

- Major players (Swedish giant IKEA) and smaller-scale suppliers with consumers willing to pay higher prices for bespoke furniture, low PED for high quality, hand crafted furniture products
- Small firms survive despite competition from lower cost producers by charging a higher price



#### Appendix 2: LESSONS FROM A PIN FACTORY

'Jack of all trades, master of none'. This well-known adage helps explain why firms sometimes experience economies of scale. A person who tries to do everything usually ends up doing nothing very well. If a firm wants its workers to be as productive as they can be, it is often best to give each a limited task that he or she can master. But this is possible only if a firm employs many workers and produces a large quantity of output.

In his celebrated book *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith described a visit he made to a pin factory. Smith was impressed by the specialisation among the workers and the resulting economies of scale. He wrote:

One man draws out the wire, another straightens it, a third cuts it, a forth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on is a peculiar business; to whiten it is another; it is even a trade by itself to put them into paper.

Smith reported that because of specialisation, the pin factory produced thousands of pins per worker every day. He conjectured that if the workers had chosen to work separately, rather than as a team of specialists, "they certainly could not each of them make twenty, perhaps not one pin a day". In other words, because of specialisation, a large pin factory could achieve higher output per worker and lower average cost per pin than a small pin factory.

The specialisation that Smith observed in the pin factory is prevalent in the modern economy. If you want to build a house, for instance, you could try to do all the work yourself. But most people turn to a builder, who in turn hires carpenters, plumbers, electricians, painters, and many other types of workers. These workers specialise in particular jobs, and this allows them to become better at their jobs than if they were generalists. Indeed, the use of specialisation to achieve economies of scale is one reason modern societies are as prosperous as they are.

Netflix is an interesting example of how disruptive technology businesses have different objectives from the standard theory of the firm. The Financial Times reported that Netflix is launching an aggressive international expansion with the aim of reaching 200 markets by 2016. Netflix will feature in Japan, Spain, Portugal and Italy this year and is exploring expansion into China next year.

The business remains some distance from achieving profitability. In a letter to shareholders, Netflix CEO Reed Hastings explained that the company plans to operate around break-even through 2016 and to rake in substantial profits starting in 2017.

#### Appendix 3: NETFLIX'S GROWTH MAXIMISATION PLAN

<http://www.tutor2u.net/economics/blog/65-million-subscribers-for-netflix>

In the increasingly contestable market for online streaming of movies, TV series and other forms of entertainment, the drive to grow your installed user base is right up at the top of the objective of senior executives. Netflix has announced that now have more than 65 million subscribers with nearly 3 million overseas customers added in the second quarter of 2015 alone.



## UNIT 3 – FIRMS AND DECISIONS II NOTES

**1. INTRODUCTION** – firms' output, pricing and non-pricing decisions/strategies are based on the objectives they seek to achieve and the market structure they are in

**Importance of knowing market structure** – facilitates decision-making on

- Freedom firms have in setting prices; amount of attention paid to the action of rivals
- Impacts level of profits made in LR, choices available to consumers, whether efficiency is achieved

### 1.1 THE FOUR CHARACTERISTICS DETERMINING MARKET STRUCTURE

Market structure is a classification system of key characteristics of a market; 4 characteristics:

- No. of sellers/firms relative to market size; extent of barriers to entry
- Nature of product; knowledge of product/market

### 1.2 TYPES OF MARKET STRUCTURE

- 4 main types – perfect competition, monopolistic competition, oligopoly, monopoly
  - Vary according to degree of competition in terms of no. and size of firms relative to market
- Market structures differ: nature of product, knowledge of product, extent of barriers to entry & exit
- **Market concentration** is a function of no. of firms and their respective shares of total production
  - More concentrated market, fewer no. of firms, larger market share of each firm
  - Competitive markets – many firms with low/insignificant market shares
  - End of spectrums: many firms competition with one another, each firm is insignificant part of industry – perfect competition; only one firm in market, no other competing firm – monopoly
  - In between: monopolistic competition and oligopoly; they are imperfect market structures
- **Price-taker** – firm unable to set its own price, takes market price; no market/monopoly power
- **Price-searcher/setter/maker** – firm determines its own price; has market/monopoly power

## 2. PERFECT COMPETITION

**Perfect competition** is a market structure whereby there is a large number of small firms relative to market size and its product is homogeneous, barriers to entry and exit are absent and information is perfect.

- Model is regarded as the 'ideal type'; often used as a standard when judging shortcomings of real-world industries; built on very strict assumptions

### 2.1 CHARACTERISTICS OF A PERFECTLY COMPETITIVE (PC) MARKET STRUCTURE

#### → Large number of buyers and sellers

- Exact no. of firms cannot be stated; condition fulfilled when each firm in market has no significant share of total market output due to lack of entry barriers
- Each firm acts independently in deciding own output level over coordinating decisions collectively
- Ex. thousands of independent US egg farmers, each acting independently in deciding output level

#### → No barriers to entry and exit – firms face no restrictions when they enter or exit the market

- Absence of financial, technical or government-imposed barriers (licenses and patents)
  - US egg farmers: low start-up costs to raise hens, ease of entry, Ks independent egg farmers
- Lack of entry & exit barriers accounts for large no. of firms with insignificant market share and why PC firms make only normal profits in the long run

#### → Homogeneous product – demand curve is perfectly price elastic

- Product of firm is identical to that of its rivals (**perfect substitutes**); no variety in PC market
  - Ex. Farmer Brown's eggs are similar to Farmer Jones' eggs
- Buyer will not show preference for product of any one firm as products are standardised
  - Characteristic rules out rivalry among firms in advertising and quality differences
- Each PC firm is a price taker; sell products at price determined by market demand and supply
  - Insignificant market share & product homogeneity, firm X able determine price of product

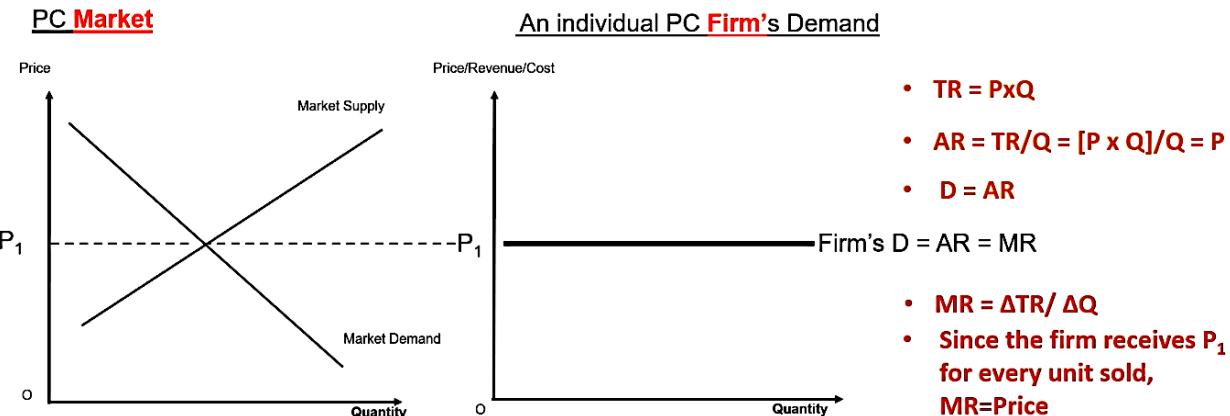
#### → Perfect knowledge – X point in influencing price

- Every seller knows rivals' price & production costs, market costs & available production technology
- Buyers have complete information about each sellers' price, quality and availability of products
  - X purchase from PC firm selling goods above prevailing market equilibrium price
  - Characteristic contributes to PC firms being price takers

## 2.2 HOW CHARACTERISTICS AFFECT PRICING DECISIONS UNDER PERFECT COMPETITION (PC)

### PC firm's pricing decision

- PC firms are price-takers: why? large no. of buyers/sellers, homogeneous product, perfect knowledge
  - No control over price of product, follow market price determined by market DD and SS
- If PC firm sells good above market price OP: QD falls to zero as consumers purchase the same product from any other firm since products are perfect substitutes/identical; **PED = ∞**
- PC firm has no incentive to reduce price below OP as it can sell all it wants at prevailing market price



### Market demand curve vs PC firm curve

- Market demand curve – horizontal summation of individual consumer's demand curve
  - Downward sloping curve; fall in market price leads to increase in QD due to Y and sub effect
- Demand for PC firm's output – horizontal straight line; every unit of output sold at market price OP
  - Demand for output is perfectly price elastic as PC firm is a price taker
  - Demand curve is also average revenue curve since demand curve reflects maximum price consumers are willing and able to pay for each unit of the good
  - Price (P) = average revenue (AR) = marginal revenue (MR)

### Revenue concepts recap

- Total revenue (TR) – total receipts a firm generated from selling goods & services in a market
  - $TR = \text{price} \times \text{quantity sold} = P \times Q$
- Average revenue – revenue per unit of output sold (assume uniform price charged regardless of Q)
  - $AR = TR/Q = [P \times Q] / Q = P$
- Marginal revenue – increase in revenue resulting from selling an additional unit of output
  - MR remains constant and equal to AR regardless of output level as sale of each and every additional unit of output adds exactly the same amount to total revenue
  - $MR = \Delta TR/\Delta Q$

## 2.3 HOW CHARACTERISTICS AFFECT OUTPUT DECISION UNDER PERFECT COMPETITION (PC)

### Profit maximising equilibrium (marginalist approach)

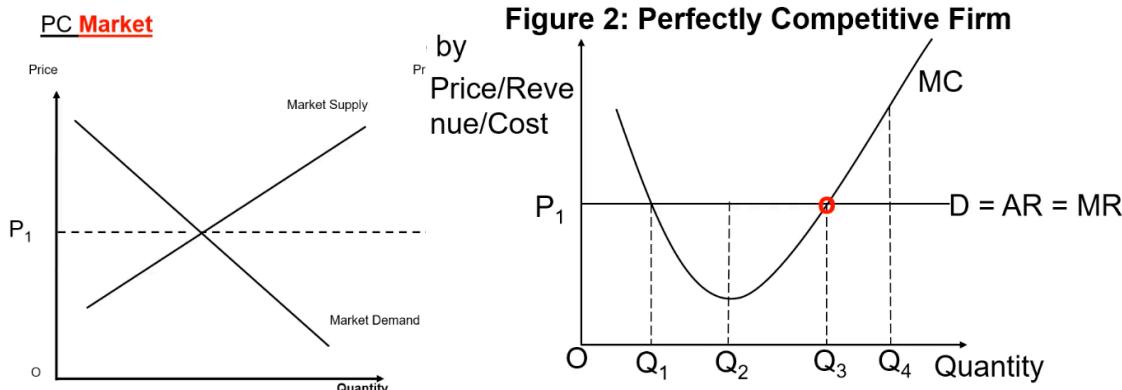
**Profit** refers to difference between total revenue (TR) and total opportunity costs (TC)

Why profits play a significant role in businesses – profits are financial returns/rewards for undertaking risks

- Banks, supplies, other lenders likely to provide finance to firm with ability to make profits
- Ability to make profits ensures long-run survival of firms in industry
- Retained profit is an important source of finance for a business
  - Retained profits – profits earned but not distributed to owners via dividends/other payments; reinvested and used to finance R&D and expansion of firm

### What is the profit maximising equilibrium?

- Traditional theory assumes firms aim to maximise total profits (max. diff. between total revenue and total opportunity cost) → aim achieved, firm in equilibrium (X tendency to change P & Q)
- Although PC firm X determine own price (accept market price), able to determine output level
  - PC firm at equilibrium if it produces level of output that maximises total profit
- To maximise total profits, PC firm makes output decisions at margin; 2 conditions at equilibrium:



#### 1. $MR = MC$ [ $MC = \Delta TC / \Delta Q$ ; $MR = \Delta TR / \Delta Q$ ]

- To maximise total profits, firm produce at output level where  $MR = MC$  (i.e. addition to total revenue from sale of last unit of output equals to addition to total cost in producing it) [OQ<sub>3</sub>]
- Firm should change its output level whenever marginal revenue is not equal to marginal cost; as:
  - OQ<sub>2</sub>: MR greater than MC; firm increase profits if production increases beyond OQ<sub>2</sub>
    - Addition to total revenue from sale of last unit of output greater than addition to total cost in producing it
  - OQ<sub>4</sub>: MC greater than MR; producing last unit causes fall in total profits; reduce output
    - Cost more to produce the last unit than what the firm gains in revenue
  - OQ<sub>3</sub>: profit-maximising level of output;  $MR = MC$ 
    - Last unit of output produced adds as much to total revenue as it does to total cost

#### 2. MC must also be rising

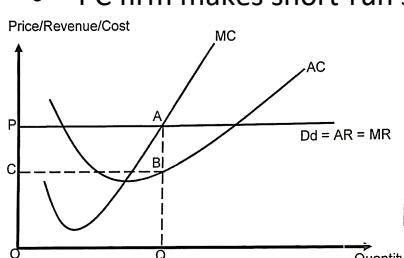
- At OQ<sub>1</sub>,  $MR = MC$  but MC is falling → firm X stop, additional output produced Q<sub>1</sub>Q<sub>3</sub> adds more to total revenue than to total cost → firm should increase output to maximise its total profits

### Short run equilibrium and shut-down conditions

- SR at profit-maximising output level, PC firm can make supernormal, normal or subnormal profits
- 3 scenarios of revenue and cost curves; profit-maximising output level is OQ;  $MC = MR$ ; MC is rising

#### 1. Equilibrium with supernormal profits ( $TR > TC$ or $AR > AC$ )

- Supernormal profit is the excess of total profit above normal profit
- PC firm makes short-run supernormal profits; incentive for new firms to enter market in LR



$$\text{Total Revenue} = OPAQ$$

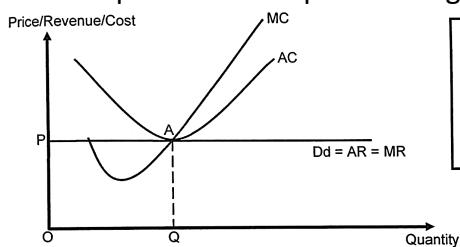
$$\text{Total cost} = OCBQ$$

$$\text{Profits} = PCBA$$

Note: supernormal profits are known as abnormal profits/pure economic profits

## 2. Equilibrium with normal profits ( $TR = TC$ or $AR = AC$ )

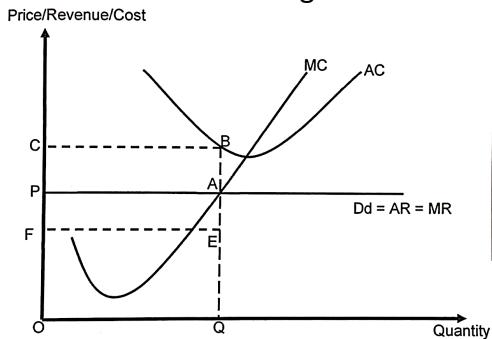
- Normal profit is the minimum profit required to keep FOPs in their current use in LR
- PC firm makes normal profits; TR adequately compensates owners for time & other resources expended to keep business going



Total Revenue = OPAQ  
 Total cost = OPAQ  
 Profits = 0

## 3. Equilibrium with subnormal profits ( $TR < TC$ or $AR < AC$ ) – total revenue X cover total costs

- Profit-maximising PC firm makes subnormal profits



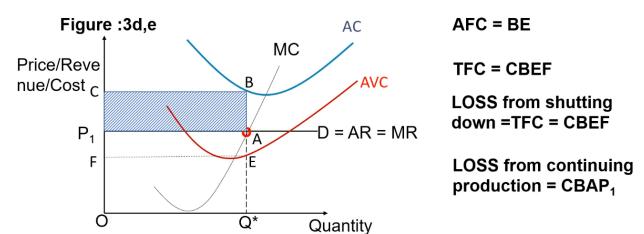
Total Revenue = OPAQ  
 Total cost = OCBQ  
 Loss (supernormal profits) = PCBA

### Short run shut down condition

- Firm making subnormal profits: 1. continue production 2. Shut down, produce 0 output temporarily
  - Why the firm X leave industry? At least one fixed FOP → firm adjusts output level to make the best of the situation and minimise losses
- Whether to continue production or to shut down in SR: consider if TR can cover variable costs
  - X consider fixed costs, incurred regardless of whether firm continues production or shuts down and produces nothing in the SR (ex. pay factory rental cost even if X production in SR)

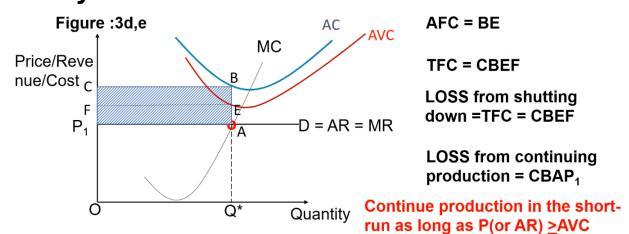
### Case 1 – firm will continue production in short run if $TR < TC$ but $TR \geq TVC$

- Firm minimises loss by continuing production rather than stopping production temporarily
- Shuts down & stops production: firm's loss is equal to its total fixed costs (area CBEF)
- Continues production ( $TR > TVC$ ): TR (area OPAQ) covers TVC (area OFEQ) and part of TFC (area PAEF)



### Case 2 – firm will shut down (stop production) in the short run if $TR < TC$ and $TR < TVC$

- Firm minimises loss by shutting down & stopping production temporarily
- Shuts down & stops production: firm's loss is equal to its total fixed costs (area CBEF)
- Continues production ( $TR < TVC$ ): TR (area OPAQ) X cover part of TVC (area FEAP) and all of TFC (area FEBC)



## Long run equilibrium and shut down condition

- PC firms only makes normal profits in LR; no barriers to entry or exit, firms seeing supernormal profits gained by industry have the ability to enter and compete in the industry
- Firms facing subnormal profits able to leave industry in LR

### Adjustment from short run supernormal profits to long run normal profits

Figure 4a: PC Market

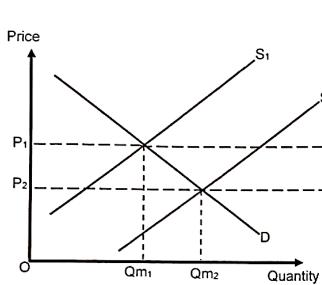
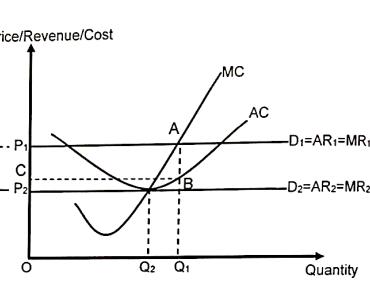


Figure 4b: PC Firm



- 4a – PC market demand and supply curves
- 4b revenue and cost curve of PC firm; firm assumed to be initially maximising its SR supernormal profits of  $P_1ABC$  at output  $OQ_1$  where  $MC = MR_1$  and  $MC$  is rising

- Presence of supernormal profits attract new firms to enter market
  - Increase in no. of firms, increase in QS at every price, market supply increases (SS curve shifts right), surplus at original price  $OP_1$ , surplus causes equilibrium market price to fall
- PC firms are price-takers, sell at lower prices; as price falls, supernormal profits are eroded
- Eventually, SS curve shifts to  $S_2$ , fall in market equilibrium price to  $P_2$ , supernormal profits of all PC firms completely eroded; PC firms make only normal profits ( $AR_2 = AC$ ) at new and lower profit-maximising output  $OQ_2$  where  $MC = MR_2$  and  $MC$  is rising; LR: PC firms make only normal profits
- Note – market supply risen to  $Qm_2$ , each individual PC firm reduced respective output from  $Q_1$  to  $Q_2$

### Adjustment from short run subnormal profits to long run normal profits

- PC firms make and expect SR subnormal profits to persist, shut down & leave market in long run
  - Why? LR time frame is a planning period when all FOPs are variable
  - Lack of barriers facilitate exit of PC firms, no. of firms in market to reduce, fall in QS of output at every price level, market supply falls, shortage at initial equilibrium price, upward pressure on price as some consumers bid up price to get goods
- (Assuming X cost condition change), higher price results in reduced losses of surviving PC firms
- Eventually, new higher eq. price in LR, surviving PC firms make only normal profits ( $TR = TC$ ,  $AR = AC$ )

### Long run equilibrium of PC firms

- PC firm only makes normal profits due to absence of entry barriers
- PC firm making normal profits in LR is indifferent between staying or leaving market in LR

No BTE: New Firms enter the industry in the long-run

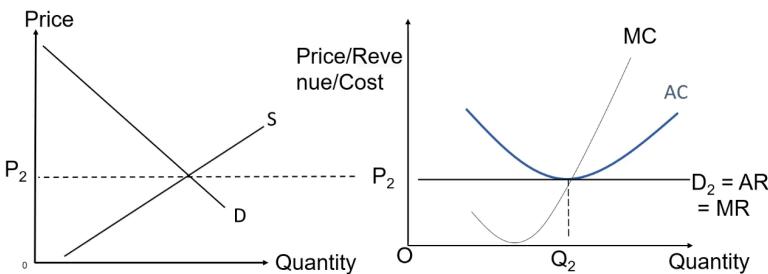
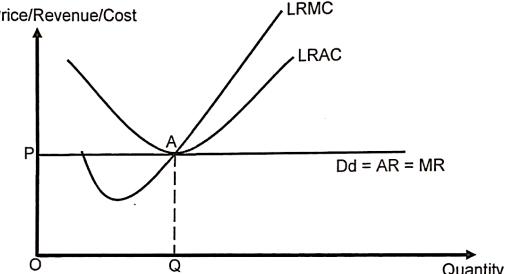


Figure 4c: Long Run Equilibrium



## SECTION SUMMARY

- PC firm: large no. of firms, complete freedom of entry & exit, homogeneous product, perfect knowledge
  - 4 characteristics affect price and output decisions and lack of marketing strategies + performance
  - No real-world market would exactly fit the 4 assumptions/characteristics of PC but some markets (farm product markets – eggs) approximate the PC model
- PC firm is a price-taker; sell output at market equilibrium price
  - X set price, v adjust output level
  - Profit-maximising PC firm use marginalist approach to set output level;  $MR = MC$  &  $MC$  is rising
- SR – PC firms make supernormal, normal or subnormal profits (as long as  $TR > TVC$ )
- LR – PC firms make normal profits due to absence of entry and exit barriers
- SR and LR shut-down conditions: should firm making subnormal profits ( $TR < TV$ ) shut down?

Short run (at least one factor input is fixed)				Long run (all factor inputs are variable)
TR > TVC		TR < TVC		Yes
No, firm minimise loss by continuing production		Yes, firm minimise loss by shutting down and producing zero output		Firm minimise loss by shutting down and leaving industry
If continue	If stop	If continue	If stop	-
TR covers all TVC and part TFC Loss = part TFC	Loss = TFC	TR covers only part TVC Loss = part TVC + TFC	Loss = TFC	-

## Learning objectives

- Explain reasons why PC firms are unable to set price; Explain shape of DD curve for PC firm
- Explain why  $MR = AR$  for PC firm; Identify profit-maximising output and price of a PC firm
- Analyse 3 levels of profit for a firm; analyse shutdown condition in SR and LR
- Analyse adjustment to LR equilibrium in PC industry

### **3. MONOPOLY**

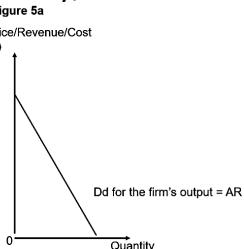
A **monopoly** is a market structure whereby the firm is the only seller of a good or service that has no close substitutes. Its barriers to entry and exit are complete and information is imperfect.

- Whether a firm is considered a monopoly is not always clear; boundaries of a market are arbitrary
- Depends on how narrowly defined the market is (ex. SMRT a monopoly for train services?)

#### **3.1 CHARACTERISTICS OF A MONOPOLY**

→ **Single producer** – a firm is a perfect/pure monopoly if it controls 100% of the market in a product

- Reality – firm is a monopoly when it controls slightly less than 100% of market, only dominant firm
  - Ex. 20<sup>th</sup> century, diamond market: De Beers controlled 80 – 90% of diamond market
- Monopoly is a price setter; decide whether it wants to charge a high price/low price for its product
  - No competition, able to exert control over how much it charges for its product
  - Ex. De Beers wielded so much monopoly power, almost totally able to control prices
- Monopolies sell at any price without fear of being undercut, but is constrained by market demand
  - Cannot increase both price and output at the same time
  - If sell larger quantity, must lower price; If sell at higher price, reduce output
- The firm's demand is the **market demand**.
- Unique product - **No Substitutes**
- Demand curve is **relatively price inelastic** compared to other markets where substitutes are available.
- The lack of substitutes gives the firm **monopoly power**.



- Demand curve for monopolist's output is also market demand curve as single firm supplies to entire market
- Demand curve for monopolist's output is downward sloping due to income and substitution effects

→ **Complete barriers to entry & exit** – new firms X enter industry even when there are supernormal profits

- Erected by incumbent monopoly; protect the monopoly power of incumbent firm
  - Charge relatively high price above MC; retain supernormal profits in LR
- (usually) temporary; potential firms drawn by supernormal profits develop new technology + devise price strategies to break into mkt → monopolies continuously must maintain such barriers
  - Ex. De Beers (1998) accounted for 2/3 world supply of diamonds; today production from its own mines gives it a mere 45% share as other big miners got hold of their own supplies of diamonds, far away from southern Africa and De Beers' control

Artificial barriers to entry – include strategic barriers and statutory barriers

**Strategic barriers** – strategic entry deterrence is any move by incumbent firm to keep potential firms out of market (ex. intensive advertising to product differentiate, R&D, limit pricing, hostile takeovers & acquisitions)

- Some strategic barriers deemed anti-competitive by British and EU competition authorities; illegal

**Employ intensive advertising** – raise awareness, boost demand, persuade customers of X close subs.

- Serves to establish reputation and induce customer loyalty (through different marketing tools)
  - Potential entrants find it difficult and costly to break into market
  - Ex. De Beers' "A Diamond Forever" in every single De Beers advertisement since 1948, created a situation where almost every person pledging marriage felt compelled to acquire a diamond engagement ring
- Monopoly's demand becomes relatively less price elastic; able to charge relatively high prices
  - Myth that supply was scarce helped maintain high prices

**Research & development** – using supernormal profits (due to complete barriers to entry) to finance R&D

- Develop new products or improve on production process
  - Lower costs (reflected by downward shift of LRAC), further entrench market power
- However, lack of existing competition due to huge barriers, firms less willing to invest in R&D

**Gaining control over supplies of essential raw materials**

- Control over production process, new firm X simply enter market without gaining control, control/limit supply, keep prices relatively high
  - Ex. diamond: De Beers (1870s) owned all diamond mines; De Beers ensured that smaller amounts of diamonds came onto market, effectively controlled supply of diamonds, keep prices relatively high

**Hostile takeovers and acquisitions** – dominant company buying up rival firm/taking stake in rival firm

- Ex. late 19<sup>th</sup> – 20<sup>th</sup> century: De Beers ran most diamond mines in South Africa, Namibia and Botswana that long produced bulk of world supply of best gemstones → De Beers bought anyone who had rough diamonds to sell on the side, added them to the mix

**Statutory barriers** – given by force of law; incumbent firm attains legal protection (exclusive rights)

- Ex. patents, copyrights, market franchises, licenses

**Patents/copyrights** – exclusive right for people who invent/create product to produce/sell for time period

- By gov. to create/support private monopolies through regulation of intellectual property rights
- Keeps demand high and relatively less price elastic (PED < 1), keeps price of product high until patent expires, competitors enter the market with a generic/similar version of the same product
- Ex. forbidding use of chemical formula by other manufacturers, patents allow pharmaceutical companies to act temporarily as monopolists in market for a particular drug

Natural/structural barriers to entry – high start-up costs, high MES, high sunk costs

- Arise from differences in production & costs between incumbent/existing firm & potential entrant
- Size of MES relative to market size indicates significance of EOS; larger MES, larger EOS

**Capacity expansions** (operating on larger scale of production) results in lower unit COP

- Exploit more internal EOS, incumbent firm more cost-efficient, much lower LRAC
- Incumbent firm more price competitive than potential entrant (operate on smaller scale, higher unit COP incurred) → potential entrant detected from entering market

**Natural monopoly** – market where market demand is large enough to support only one large firm operating at/near minimum efficient scale of production (MES)

- LRAC curve falls continuously over entire market output, very high MES as percentage of market output (close to 100%), only room for one supplier to fully exploit all available EOS to meet demand
- Substantial IEOS, large firm operates closer to MES, lower LRAC; new entrant operates on smaller scale than incumbent, higher LRAC → incumbent reduce price below new entrant's LRAC

Barriers to exit (sunk cost) – financial implications of leaving industry act as barrier of entry to new firms

- Why? increase the risk of making huge losses if decide to leave market (ex. sunk cost)

**Sunk costs** – costs which once committed cannot be recovered

- Arise as some activities require specialised assets that X readily diverted to other uses
- 2<sup>nd</sup> hand markets for such assets are limited; examples include
  - Capital inputs specific to industry; little or no resale value
  - Advertising, marketing, and R&D projects costs; X carried forward into another market
  - Cost of building expensive and complex IT systems; subsequently ditched as unworkable

→ **Unique product** – no close substitutes for product (due to strong entry barriers); monopoly power

- Monopoly has relatively greater price-settling ability than firms in other market structures, demand for monopoly's output is relatively less price elastic, PED and CED relatively low
- Ex. one of the keys to De Beers' success: persuaded many people through clever marketing to perceive diamonds as a good with no close substitutes even though a diamond is simply a sparkly stone that looks nice in jewellery (rubies, sapphires, emeralds able to rival it); famous phrase 'A diamond forever' ran in De Beers' advertising campaign in US from late 1930s to late 1950s → created the idea that diamond is the recognised symbol of betrothal

→ **Imperfect knowledge** – consumers not fully aware of costs and production of product

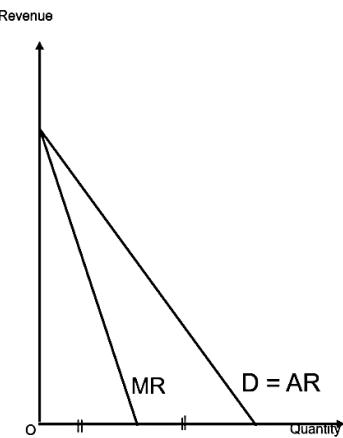
- Often, technology used in production is closely guarded (use of patents), further increases price-settling ability of the monopolist

Characteristic	PC	Monopoly	MPC
Number of firms	Very many	One	Many
Barriers to Entry/Exit	Non-existent	Complete	Low
Type of product	Homogeneous	Unique	Differentiated
Information	Perfect	Imperfect	Imperfect

### 3.2 HOW CHARACTERISTICS AFFECT P & Q DECISIONS OF PROFIT-MAXIMISING M. (marginalist approach)

#### Monopolists' demand curve for output of their products

Figure 5b

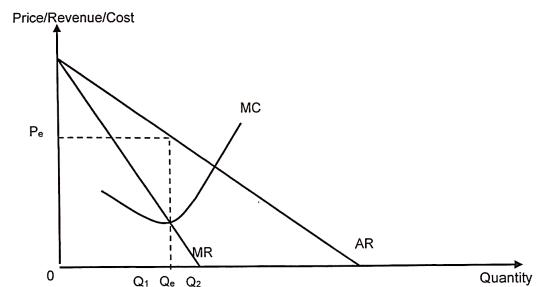


- Traditional theory – monopolist seeks to maximise profits
  - Marginalist approach: explain relationship btwn AR & MR
- Uniform price charged for each unit, DD curve = AR curve
  - DD, AR & MR curve is downward sloping
  - AR > MR always at any Q (except for 1<sup>st</sup> unit)
- MR curve – negatively sloped, MR < AR (P) in an imperfect market structure for every Q
  - Why? monopolist charges uniform price for every unit of product, lower price on all units to sell an extra unit → MR equal to price from sale of last additional unit minus loss of revenue from sale of all other units at lower price
  - Note – relationship between AR and MR applies for all price setters in imperfect market structure

#### Profit-maximising condition of monopoly

- Profit-maximising monopoly at equilibrium if producing at level of output that maximises total profit
  - Has to make output decisions at the margin by weighing MC against MR
  - At equilibrium: **MR = MC** (all firms in imperfect market structure)

#### Reference to figure showing profit-maximising output level of a monopoly



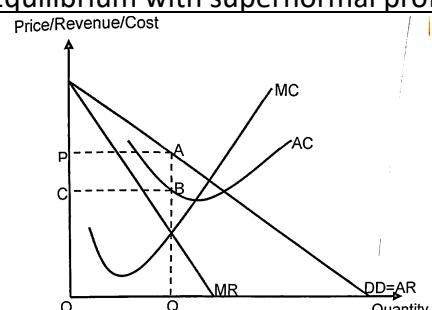
- Profit-maximising output level is OQ<sub>e</sub>, where MR = MC
- Output level Q<sub>1</sub>: MR > MC; firm should expand output beyond Q<sub>1</sub>
  - Additional unit of output sold adds more to revenue than cost, increases profits of firm
- Output level Q<sub>2</sub> (beyond Q<sub>e</sub>): MR < MC
  - Additional unit of output sold adds more to cost than revenue, reduces profits of firm
- Output level Q<sub>e</sub>: MR = MC; firm is in equilibrium
  - Profits maximised, charged price of P<sub>e</sub> based on demand curve

\*price charged under monopoly is higher than marginal cost at profit-maximising output

#### Short run equilibrium of a profit-maximising monopolist (Q<sub>e</sub> and P<sub>e</sub>, where MR = MC)

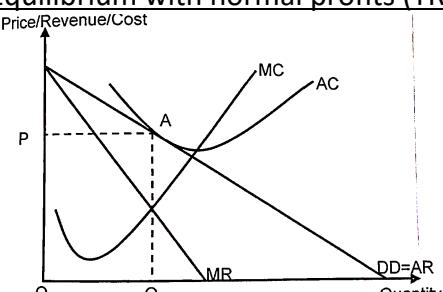
- In the SR, profit-maximising monopolist may earn supernormal, normal or subnormal profits

#### 1. Equilibrium with supernormal profits (TR > TC or AR > AC)



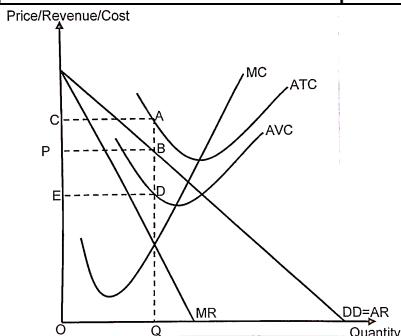
Total Revenue = OPAQ  
 Total cost = OCBQ  
 Profits = PCBA  
 Note: supernormal profits are known as abnormal profits/pure economic profits

#### 2. Equilibrium with normal profits (TR = TC or AR = AC)



Total Revenue = OPAQ  
 Total cost = OPAQ  
 Profits = 0

### 3. Equilibrium with subnormal profits ( $TR < TC$ , $TR > TVC$ or $AR < AC$ but $AR > AVC$ ) – TR X cover TC

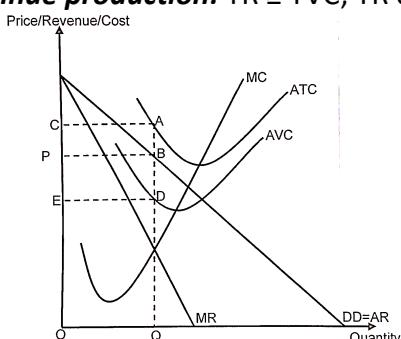


Total Revenue =  $OPBQ$   
 Total cost =  $OCAQ$   
 Loss (supernormal profits) =  $CPBA$

#### Short run shut down conditions

- Though monopolist is the only seller, X guarantee that it will not make a loss in the short run → aims to minimise its losses when a loss is incurred (like PC firm)
- Firm's equilibrium where  $MR = MC$  is the loss-minimising level of output

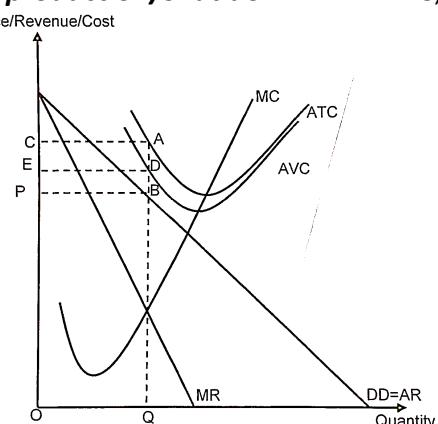
**Continue production:**  $TR \geq TVC$ ; TR cover at least TVC of production in short run



Loss if production continues =  $CPBA$   
 Loss if shut down =  $TFC = CEDA$   
 $TR = OPBQ$ ;  $TVC = OEDQ$   
 Part of  $TFC$  recovered when  $OQ$  is produced =  $EPBD$

- Monopolist incurs smaller loss by continuing production
  - By producing  $OQ$ , TR covers all variable cost ( $OEDQ$ ) and some fixed costs (area  $EPBD$ )
- Note – vertical distance between ATC and AVC is AFC

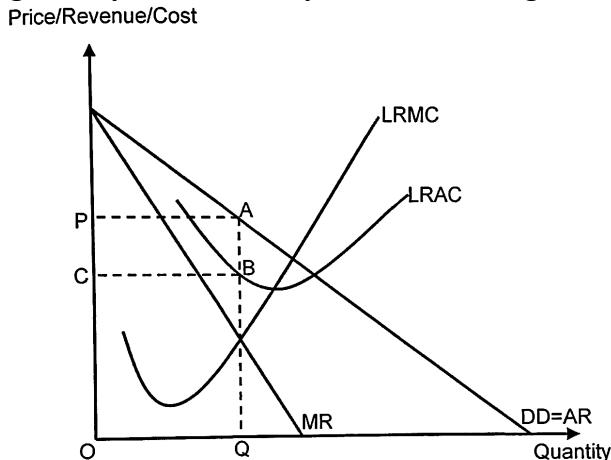
**Stop production/shut down:**  $TR < TVC$ ; TR X cover at least TVC of production in short run



Loss if production continues =  $CPBA$   
 Loss if shut down =  $TFC = CEDA$

- Loss from shutting down is less than loss from continuing production
- SR: shut down; LR: exit industry if situation is unchanged

## Long run equilibrium of a profit-maximising monopolist ( $Q_e$ and $P_e$ , where $MR = MC$ )



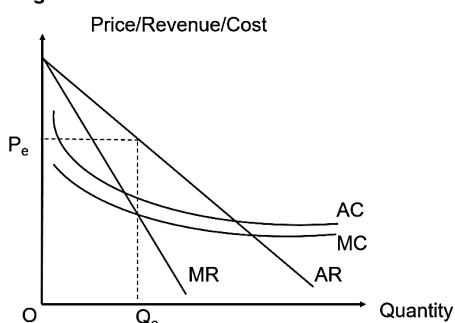
- Possible to retain supernormal profits in the long run by erecting huge barriers to entry
  - LR shut-down conditions: remain in business only if it can at least make normal profits/break even
    - LR equilibrium: output level where  $LRMC = MR$  and  $TR \geq TC$
- Question – what are the levels of profit a monopolist could earn in the LR?
- All levels, high BTE in market structure means new firms find it difficult to enter and challenge incumbent, hence, monopolist retains its supernormal profit in LR

**Natural Monopoly** is a market in which the market demand is large enough to support only one large firm operating at or near its minimum efficient scale of production (MES)

- Large internal EOS relative to market size, competition between  $\geq 2$  firms X make sense
  - High capital outlay (required infrastructure costly to replicate)  $\rightarrow$  natural monopoly arises
- LRAC curve falls continually over entire market demand, large MES relative to market demand

Example – electricity-supply market (natural monopoly)

Figure 8



- Prohibitively high overhead costs, FC relatively high compared to VC of supplying another unit of electricity
  - Overhead costs: building power plants and huge systems of distribution poles and wires
- Firm selling the most electricity spreads overhead costs more widely over a larger output level
  - Exploit available technical economies of scale more fully, lower LR cost per unit than firm with same fixed cost but lower output
- Lower unit cost, incumbent can deliberately reduce price of product to ward off potential entrants
  - New entrants operating on a smaller scale able to compete effectively with incumbent operating on larger scale

- Natural barrier discourages potential new firms from entering, big firm have large cost advantage in providing all of the electricity in a given region

## SECTION SUMMARY

- Monopoly: sole seller in market, unique product, imperfect knowledge, high barriers to entry and exit
- Different type of barriers to entry and exit – categorised into artificial barriers and natural barriers
- Monopolist is a price-setter
  - Profit-maximising monopoly uses marginalist approach to set its output levels
  - Profit-maximising output level occurs when  $MR = MC$  (applies to price-setting firms in all markets)

Note – students are expected to be able to explain and/or illustrate each of the above statements

## 4. MONOPOLISTIC COMPETITION

**Monopolist competition** is a market structure whereby a relatively large number of small firms sell similar but differentiated products, barriers to entry and exit are low, and information is imperfect.

- Sellers retain a certain degree of market power as products are differentiated
- (unlike PC) no market demand curve; no single equilibrium price in the market; many prices prevail
  - Why? product differentiation & lack of perfect knowledge amongst consumers and sellers
- Ex. hawker stalls in SG, coffee shops clusters, fast food outlets in busy town centre, hairdressers in local area, small scale nurseries, care homes for elderly

### 4.1 CHARACTERISTICS OF A MONOPOLISTIC COMPETITIVE (MPC) MARKET STRUCTURE

→ **Large no. of small buyers & sellers relative to market size**; each firm has small share of total market

- Arises from low barrier to entry; each firm has relatively small share of market
  - Market power limited, ability to set price above marginal cost is limited
- Each firm acts independently of the other; X take into account reaction of rival firms
  - Why? X possible with so many rivals, retaliation by rivals less likely → if firm lowers price, its gains in sales revenue will be spread thinly over many of its rivals
  - Negligible extent to which each rival firm suffers, each firm determines its own price-output policy with little consideration of possible rival reactions, unlike mutual interdependence
- MPC firms engage in non-pricing competition to differentiate their products
  - Why? maintain customer loyalty through product differentiation, provides firms with certain degree of market power to set price
- Ex. SG: each hawker stall operates on limited scale (small stall space, limited amount of cooking and eating utensils, 1/2 helpers)

→ **Low barriers to entry and exit** – result in large no. of small firms existing in MPC market structure

- Include relatively low start-up costs, relatively easy to copy technology, relatively mobile FOPs
- Low barriers, easier for firms to enter/leave industry, ensuring large no. of small firms
  - Ex. relatively easy to apply for hawker license as compared to telecommunication industry, cost of setting up hawker stall relatively low due to overhead cost (cooking facilities) is relatively low, low rental costs
- Low barriers of entry, MPC firms only make normal profits in LR
  - Potential entrants easily enter market, erode supernormal profits existing firms make
- Slightly differentiated products; engage in advertising and promotion on relatively small scale
  - Why? Inability to retain supernormal profits in LR restricts firms' ability to engage in large-scale advertising/invest huge sums of money in R&D, slightly differentiated products
  - But presence of many rivals makes product differentiation (PD) necessary
  - Ex. flyers, off-peak time slots on television, classified sections of newspapers

→ **Differentiated products** – only slightly differentiated, many close substitutes available; 3 forms of PD.

- Firm's demand curve is downward sloping but relatively price elastic due to availability of subs.

Real physical differences – through product development and innovation, goods serving similar purposes altered in a way that differ in some (minor) ways

- Ex. differences in materials used in production and workmanship
- Ex. SG hawker stalls: many varieties of food in each hawker centre (CL, Malay, Indian, Western cuisine); variation within each food type (chicken rice differentiated through taste and flavour due to differing cooking styles between stalls/different recipes)

Imaginary differences – through design, packaging, branding, method of promotion (exclude quality)

- Achieved via non-price competitive techniques (marketing techniques, advertising, packaging)
- Serve to inform, persuade, and convince consumers to purchase products → increase demand + demand relatively less price elastic, greater leeway to raise prices w/o losing market share

Differences in conditions of sale – achieved through differences in location of shops and quality of service

- Ex. level of customer service and ambience

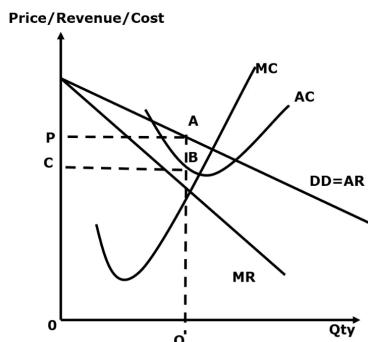
→ **Imperfect knowledge** – sellers and buyers have imperfect information on production methods & prices

- Ex. hawker stalls: rivals X complete information on all ingredients used by a hawker; consumer X complete information on ingredients used by hawkers/all available prices offered by all hawkers

## 4.2 HOW CHARACTERISTICS AFFECT P & Q DECISIONS OF PROFIT-MAXIMISING MPC

### Short run equilibrium of a profit maximising MPC firm

- SR – may earn supernormal, normal or subnormal profits depending on cost and revenue conditions
- ✓ cover variable costs: continue production; if not: shut down & stop production temporarily



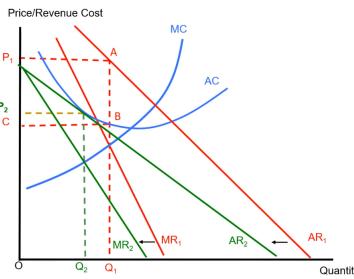
**At profit-maximising equilibrium output level  $OQ_1$ ,**

**Total Revenue =  $OP_1AQ_1$**

**Total Cost =  $OCBQ_1$**

**Profits =  $CP_1AB$  (supernormal profits)**

### MPC: Adjustment to LR eqm from SR supernormal profits (pg 52)



Initial SR supernormal profits  
New firms enter  
*Why? Low BTE*  
More close substitutes  
Demand for existing firm falls  
- AR curve shifts down  
- Demand becomes more price elastic (AR curve gentler)  
- Firm's profit-maximising price and quantity falls  
LR equilibrium ( $MC=MR$ )  
Can only make LR normal profits:  
 $AR = AC$

### Long run equilibrium of a profit maximising MPC firm

LR – MPC makes only normal profits due to low barriers of entry and exit

- When incumbent firms make supernormal profits, new firms enter the industry
- When firms make subnormal profits, firms X cover TVC will shut down and leave the industry

### Adjustment from short run supernormal profits to long run normal profits (due to low BTE)

- Profit maximising MPC firm initially earning SR supernormal profits (area  $P_1ABC$ )
  - Initial profit maximising equilibrium – output  $OQ_1$  and price  $OP_1$ , where  $MR_1 = MC$
- Ease of entry allows new firms to enter industry, sell products that are potential substitutes to those sold by existing firms, consumers have wider range of products (more close substitutes)
  - Assuming total market demand for product remains unchanged, entry of new firms, more substitutes available, demand for each firm falls, demand relatively more price-elastic
- Demand curve shifts downwards from  $AR_1$  to  $AR_2$  (tangential to AC curve at output  $OQ_2$ )
  - Only normal profits made; output  $OQ_2$  is the new and lower profit maximising output level where  $MR_2$  equates  $MC$ , equilibrium price fallen to  $OP_2$

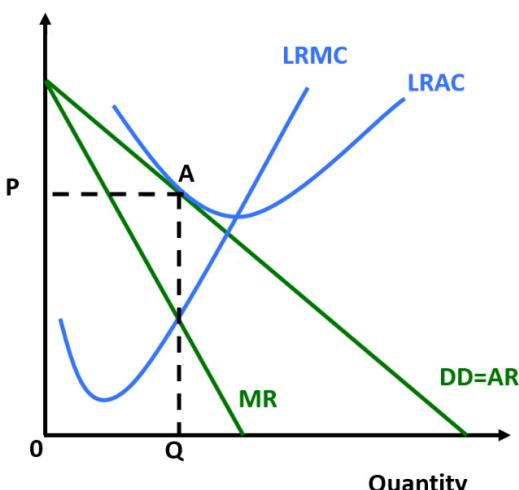
### Adjustment from short run subnormal profits to long run normal profits

- If MPC firms make SR losses, those with  $TR < TVC$  will be forced to leave the industry due to low BTE
  - Fewer firms left, fewer competitors, demand for existing firms' product rises, less price-elastic
- AR curve shifts right, become relatively steeper until it is tangential to AC curve, only normal profits
  - Resultant increase in price, reduction in losses until LR equilibrium of normal profits restored
- Reality – stable equilibrium reached as new products come and go all the time
  - Existing products typically go through product life cycle, affect volume and growth of sales

### Long run equilibrium of profit maximising MPC – only normal profits due to low barriers to entry & exit

Price/Revenue/Cost

### Low Barriers to Entry & Exit



**Total Revenue =  $OPAQ$**

**Total Cost =  $OPAQ$**

**Profits = 0**

## **SECTION SUMMARY**

- 4 characteristics of MPC firms: large no. of small firms relative to market size, slightly differentiated products, imperfect knowledge, low barriers to entry and exit
- MPC firm is a price-setter as products are only slightly differentiated
- Profit maximising MPC firm
  - Can make supernormal, normal or subnormal profits so long as  $TR > TVC$  in short run
  - Can only make normal profits in the long run due to low barriers to entry and exit
- Note: students are expected to be able to explain and/or illustrate each of the above statements

## **Learning objectives**

- Explain key features of an MPC firm that distinguishes it from other market structures (PC & monopoly)
- Analyse the profit maximising output and price of a monopolistically competitive firm
- Analysing the different levels of profits an MPC firm makes
- Explain the adjustment to LR equilibrium of normal profits for MPC firm

## **5. OLIGOPOLY**

An **oligopoly** is a market dominated by a few large firms where market concentration is high.

- Firms are mutually dependent; must consider rivals' reactions to price, non-price & output decisions
- High barriers to entry and exit, imperfect knowledge; produce homogeneous/differentiated products

### **5.1 CHARACTERISTICS OF AN OLIGOPOLY**

→ A few dominant firms relative to market size [IMPORTANT! **Market concentration ratio (MCR)**]

- **Price-setters**; able to set prices
  - Why? few firms command large proportion of market share, relatively high market power
  - Duopoly (Greek): two sellers dominating market; oligopoly: few sellers dominating market
- Degree to which oligopoly power has developed in any industry is indicated by measuring MCR
  - **MCR** – extent to which firms dominate the market/industry in terms of market share
  - Measured as a 3-firm, 4-firm, 5-firm concentration ratio
  - Ex. 3-firm concentration ratio: sum of market share of 3 largest firms in industry
- Oligopoly market might have dozens/hundreds of individual firms, but most are unimportant
  - A small number (2 to 20 firms) dominate the industry
- Higher degree of interdependence or rival consciousness exists amongst firms in an oligopoly
  - Why? presence of few dominant competitors, every action taken by single dominant firm affects sales of all other firms in the market significantly; rivals actions X ignored
  - Ex. mutual interdependence within US fast food market: vital part of US fast food companies to keep close eye on rivals' activities (ex. McDonalds introducing a new kind of burger, Burger King offering promotional discounts on sodas); rivals' behaviours affect sales and profitability of each fast-food venture

Examples – oligopoly market structures

- Market share of top beer firms in global brewery industry (39.9% AB InBrew, 17.9% SABMiller, 11.6% Heineken, 4.6% Carlsberg, 3.1% Asahi, 2.9% Molson Coors, 20.0% Others)
- Global car manufacturing industry – Volkswagen, Toyota, General Motors, BMW
- US music industry – 4 major recording labels (Universal Music Group, Sony Music Group, Warner Music Group, EMI Group)
- SG telecommunication service providers (Singtel, Starhub, M1)
- SG petrol retailers (Exxon, Mobil, Shell, SPC, Caltex)
- Dominant global oil producers (OPEC – organisation of Petroleum Exporting Countries of which 5 founding members include Iran, Iraq, Kuwait, Saudi Arabia, Venezuela), Russia, US and China

→ Huge barriers to entry – result in high market concentration; high degree of interdependence

- High barriers to entry and exit, oligopoly able to retain supernormal profits in LR

Artificial barriers to entry – strategic barriers and statutory barriers

**Strategic barriers**

**Limit & predatory pricing** – low deliberate prices by dominant competitor; restrict/prevent competition

- Limit pricing – charging a price lower than profit-maximising price
  - To prevent rivals operating on smaller scale of production, incur higher LR unit COP from entering market as potential entrants X match price of incumbent w/o subnormal profits
- Predatory pricing – lowering prices below costs: drive out existing competitors; scare off entrants
- Whatever approach: limit & predatory pricing is illegal under competition law in many countries

**Advertising & branding** – establishes brand loyalty; difficult/costly for potential firms to break into market

- Deter potential entry by competitors [exam: provide ex. specific to context of the question]
- Ex. Coca-Cola and PepsiCo, 2 dominant players in cola industry; hard for new cola manufacturers to break into global market as both have successfully built strong brands; tough to persuade consumers to switch to new colas
- Ex. blind taste tests found that most ardent fans of one brand who claim to be able to distinguish between the two brands X distinguish between Coca-Cola and Pepsi → shows that advertising mainly serves to persuade people that the products are more different than they really are

**Statutory barriers** – discussed in detail in 3.1

Natural barriers to entry – few dominant firms enjoy substantial internal EOS

- LRAC falls over large output; new entrant X produce at scale of production matching incumbent
  - Why? initial lack of consumer base, difficult for new entrant to produce at output level close to MES, AC of production higher than incumbent firms producing at output level closer to MES → harder for new entrants to compete with dominant firms in market

## → Products can be homogeneous (standard) or differentiated

Perfect/pure oligopolies – homogeneous products (metals, chemicals, petrol crude oil)

- Theoretically: only one price prevails, but each firm is a price-setter (control over its pricing policies) as market is dominated by a few firms
- Does not allow for non-price competition through product differentiation

Imperfect oligopolies – differentiated products (cars, soft drinks)

- Less fear of immediate reaction from rivals; rivals perceive  $\Delta p$  due to modifications to product
  - However, market dominated by a few large firms → rivalry and interdependence prevail
- Product differentiation as a form of non-price competition; multiple prices exist
  - Occurs at a bigger scale than in MPC; huge funding in R&D/very large-scale advertising
  - Why? unlike MPC (normal profits in LR due to low entry barriers and exit), oligopolies retain supernormal profits in LR due to high barriers to entry → incentivised to use non-pricing strategies extensively to Maintain grip on market share
  - R&D – Increase range and quality of products, increase demand for firm's products + market demand relatively more price inelastic
- Ex. Apple vs Samsung: top 2 dominant firms in smartphone manufacturing industry

## → Imperfect knowledge – sellers & buyers have incomplete information on production methods & prices

- Firms: imperfect knowledge of **production methods** serves as barrier to entry of potential entrants
- Consumer: imperfect knowledge on **prices** increases price-setting ability of oligopoly

## 5.2 HOW CHARACTERISTICS AFFECT P & NON-P DECISIONS OF PROFIT-MAXIMISING OLIGOPOLY

### How oligopolies' market structure affects their P & non-P decisions

- Firms are mutually dependent as market dominated by a few large firms
  - Success of firms largely determined by actions of major rivals → rivals' actions affect firm + firm never certain of how rivals will react → firm monitors the actions of major rivals closely
- No single theory on pricing and output decisions; difficult to predict oligopoly's behaviour
  - Why? uncertainty on demand, competitor's cost, actions & responses to firm's strategies
- Ex. considerable amount of uncertainty in market, prices general stable but price wars may break out → may choose to set a P & Q level to profit maximise, others: collude to reduce uncertainty

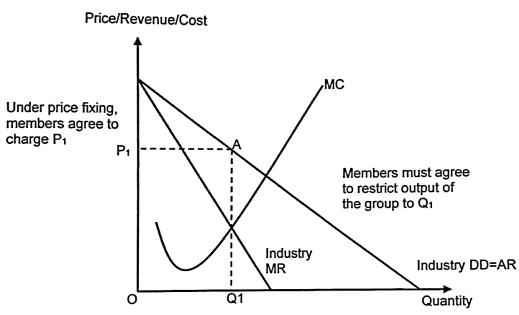
### 1. Cooperative model – collusive oligopoly

**Collusion** is a formal/informal agreement among oligopolistic firms on the prices to charge and how to divide the market [formal (explicit) – cartel; informal (tacit) – price leadership]

- Main motive – reduce uncertainty/unpredictability (ex. of rivals' reactions to firms' pricing strategies)
- Other reasons – cutting costs of competition (ex. marketing wars)
- Limit competition among themselves: agreed output quotas, fixed prices, limits on extent of production promotion/development, and agreements not to poach each other's markets

## → Cartels (ex. organisation of petroleum exporting countries – OPEC)

- Purpose – reduce uncertainty arising from mutual interdependency, formally collude + form cartel, agree to maximise joint/industry's profits



### How a cartel works

- How it works? Act as monopoly, joint profits maximised at  $OP_1$  &  $OQ_1$  where cartel's MC equals MR
  - MC curve (cartel) is horizontal sum of individual members' MC curves
  - MR curve is derived from industry demand
- How joint profits are maximised? restrict total industry output, each firm given a production quota
  - Cartel members agree on how to divide the market; usually based on current market share

## **Risks & uncertainties involved in a cartel** (despite strong incentive to cooperate to maximise joint profits)

- Incentive to cheat 'secretly' to increase profits above share of joint profits
  - Why? while joint profits maximised, members' individual profits X maximised as production quota falls short of members' own profit maximising output level → incentive to increase production beyond given quota to maximise own profits
  - Result in collusive agreement being fragile, risky and uncertain, resulting in unstable outcomes → individual members increase output beyond given quota, other members increase production → rise in market supply, prices fall, collusive agreement collapses
- Cartels (agreements to restrict Q to fix P) deemed illegal by many countries globally (US, UK, EU)
  - But hard & complex to prove that group of firms deliberately joined together to increase P

## **Factors favouring formation of cartels**

- Smaller no. of firms in industry; easier to negotiate, collude and monitor
  - Cartels controls total supply more easily & identify firms who are cheating on output quota
- More significant barriers to entry; less fear of disruption of Cartels by new entrants in market
- More standardised/homogeneous product, more similar production methods & cost conditions
  - Easier to monitor quantity and pricing: easier to reach agreement on price and production quotas OR change prices at same time by same percentage
- Stable market demand (X cyclical, reasonably predictable, X subject to violent fluctuations)
  - Avoid excess demand (shortage)/supply (surplus) and incentive to cheat situation
    - Falling market demand creates excess capacity, puts pressure on individual firms to discount prices to maintain sales revenue
  - Less need to renegotiate cartels
    - Fluctuating market conditions, difficult to make agreements due to difficulties in predicting and due to need to make frequent amendments to agreements
- Weak anti-competition legislation/enforcement

→ Price leadership model (tacit collusion) occurs when leading firm in industry is able to exert enough influence in a sector that it can effectively determine the price of goods or services for the entire market

- Induced by incomplete information about motivation of other firms
- Case where unwritten rules of collusive behaviour arise (firms X engage in price cutting, excessive advertising, other forms of competition)

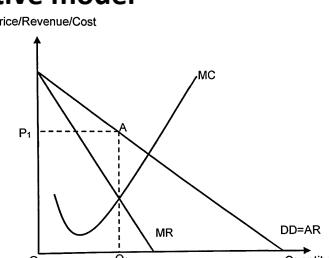
## **How price leadership works**

- Price set by market leader is accepted as market price by other firms; prices tend to be stable
  - Why? deemed best way of protecting their market share and profits
  - When leader initiates a change, other firms follow
- Price leader selects price and output combination that maximises its own profits
  - Result in price and output similar to that in a monopoly or with collusion

## **How the market leader is 'selected'**

- Barometric model – firm most adept at identifying changes in market conditions (most reliable)
  - Respond more efficiently within market sector, company known for having skill in this area, other producers follow its lead under assumption that price leader is aware of something they have yet to realise
- Dominant firm model – dominant firm controlling vast majority of market shares (market share)
  - As dominant firm adjusts prices, any smaller firms within segment must follow to maintain small amount of market share they currently possess (may engage in predatory pricing)

## **2. Competitive model**



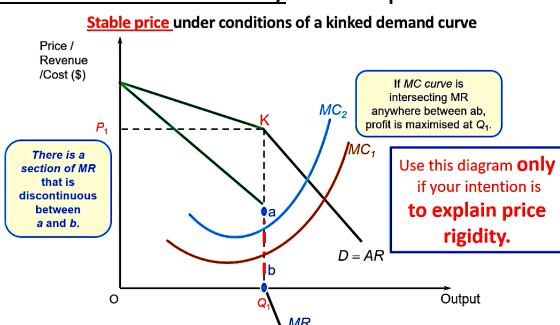
- Diagram of profit maximising oligopoly firm similar to firm operating under imperfect competition with the slope of the demand curve steeper than that of a monopolistically competitive firm

## → Price rigidity (kinked demand curve theory)

Kinked demand curve theory – prices generally stable in oligopoly due to fear of competitor's reaction

- Each oligopolist assumed to want to protect and maintain its own market share
  - Conjectures that rivals will match any price decreases, but X follow in any price increases
- Oligopolist raises prices: competitors X follow suit, A loses market share, sales revenue falls
  - Why? A raises prices, others leave price constant, QD for A fall more than proportionately to increase in its own price, in turn lead to fall in total revenue
- Oligopolist lowers prices: competitors all follow, match price reduction, A X gain market share
  - Sales expand only in proportion to expansion in industry's sales, QD increases less than proportionately to fall in own price, lead to fall in total revenue
- Hence, oligopolists reluctant to change prices (due to assumptions on competitors' reactions)
  - Even when shift in marginal costs of production, profit maximising strategy of each oligopolist will be to hold prices constant, unless change in MC of production is significant

Limitations of the theory – no explanation for how current price is arrived at (where DD curve is kinked)



- Fig assumes that current price and output level of oligopolist is  $P_e$  and  $Q_e$  respectively
- Demand curve kinked at A as rivals will match price cuts but not price rises

- DD curve much less price elastic for price cuts below  $P_e$  than price increases above  $P_e$ 
  - Price increases: X matched by other firms, more than proportionate fall in QD for oligopolist's output, fall in TR, larger loss of market share, profits will fall, ceteris paribus
  - Price cuts: matched by other firms, fall in price, less than proportionate increase in QD, fall in TR, profits will fall, ceteris paribus
  - Hence, prices tend to be rigid in an oligopoly

### Why prices tend to be rigid in an oligopoly

- Kinked DD curve gives rise to MR curve with discontinuous section directly below kink at  $Q_e$ 
  - Higher & flatter MR curve before  $Q_e$  corresponds to higher & flatter DD curve before  $Q_e$
  - Lower & steeper MR curve after  $Q_e$  corresponds to steeper portion of DD curve after  $Q_e$
  - Oligopolist produces  $Q_e$ , output at which MC<sub>1</sub> crosses the MR schedule
- Discontinuity in MR curve at current price-output combination,
  - If MC rise within region of discontinuity, from  $MC_1$  to  $MC_2$ , oligopolist absorbs higher costs, X pass to consumers as higher prices
  - Effect – oligopolist leaves existing price-output combination of  $OP_e$ - $OQ_e$  unchanged

## → Price wars (predatory pricing) arise when there is considerable excess capacity in the industry

- Likely initiated by firms with the largest minimum efficient scale

### Why firms initiate price wars

- Firm initiating price wars make losses in SR with intention of gaining greater market share and maximising profits in LR
- Why? rivals operating on smaller scale incur higher unit COP
  - If X respond: DD, TR and profits are reduced
  - If respond: retaliate by under-cutting price reduction to maintain market share, vicious cycle of under-cutting is created
- Outcome – price falls significantly (X sustainable & X persist over long-term)
  - Profits fall, may make subnormal profits, leave if X sufficient past profits to tie over losses
    - SR: shut down by stopping production temporarily if X cover variable costs

- LR: leave industry if X cover total costs
- Rivals driven out industry, firm emerging victorious gain larger market share + greater market power → higher profitability
- Consumers benefit from low prices during price war but may suffer from higher prices and fewer choices once price wars end

#### Factors favouring price wars in an oligopoly

- Weak market demand creating excess capacity
- Heavy competition and several comparable products
- Dominant firm has healthy bank balances
  - Increases market share by driving out weaker competitors using predatory pricing

#### Interdependence of oligopolistic firms' decision making – pulls oligopolies in two directions

- Incentive to compete to gain larger market share
- Incentive to collude to reduce uncertainty and risks by acting as one to maximise industry's profits

#### **Link to why oligopolies' behaviours are unpredictable and may change over time**

- Firms may compete intensely for a period of time and realise that there is no winner
- Start to collude and jointly raise prices and reduce advertising costs
- After a period of collusion, competition erupts again
  - Precipitated by new entrant, development of new product/design, changes in market DD
  - OR firms X resist temptation to 'cheat'
- Result in unpredictable and changing behaviour of oligopolies

#### **Synthesis of oligopoly behaviour – preference for non-price competition**

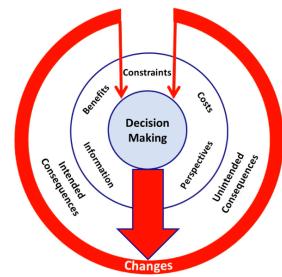
- Mutual dependence and uncertainty, oligopolists can either compete or collude
  - Stable prices – price rigidity under competitive oligopoly; collusion to reduce uncertainty
  - Occasional price wars – compete and gain greater market share
- Unlike other market structures, behaviour of firms in oligopolistic markets varies according to circumstances the firm is in → uncertainty
- Imperfect oligopolies (heterogeneous goods) tend to prefer use of non-pricing strategies
  - Why? to minimise the risk of price wars/breaking of collusive arrangements
- Ex. product development, product proliferation, other marketing strategies (giving free gifts)
  - Brand identity: reduce substitutability, increase brand loyalty
  - Product development: complete process of delivering a new product/improving existing ones
  - Product proliferation – marketing many variations of same products → diversity, to capture a sizable portion of market; limitations: marketing so many products lead to resources being wasted, mistakes made in the buying, higher inventory, higher inventory costs
  - Freebies – offer a free gift with purchase; complementary products; aim to encourage consumers to purchase the product by demonstrating that purchasing the product is a good deal; seek to reduce substitutability to increase profits of the firms (pg 71 – 72 school notes)

#### **SECTION SUMMARY**

- 4 characteristics of oligopoly: few dominant firms, high degree of mutual interdependency, differentiated or homogeneous products, imperfect knowledge and high barriers to entry and exit
- Oligopolies face considerable amount of uncertainty about demand, competitors' costs, actions and responses to their strategies → no single theory on pricing and output decision of oligopolistic firms → difficult to predict the oligopoly's behaviour
- Competitive models and collusive models of oligopolies
  - Competitive models – kinked demand curve theory (price rigidity), price wars
  - Collusive models – cartels, price leadership model (tacit collusion)
  - Oligopolies generally prefer non-price competition, but price wars arise occasionally
- Oligopolies can retain supernormal profits in the long run due to high BTE
- Note: students are expected to be able to explain and/or illustrate each of the above statements

## 6. DECISION-MAKING AND STRATEGIES

- PC firm – cannot make pricing decisions, but can adjust output level to maximise its profits
- Firms in **imperfect market structure** – make decisions on both price and output
- Firm's decision on strategy to employ is motivated by one or more of the following considerations:
  - Increase revenue, lower costs, competitor's actions, business risk, uncertainty consideration
- In deciding on strategy to implement, firm to consider its objective (s), various constraints faced, costs incurred in implementing the strategies, and intended/unintended consequences



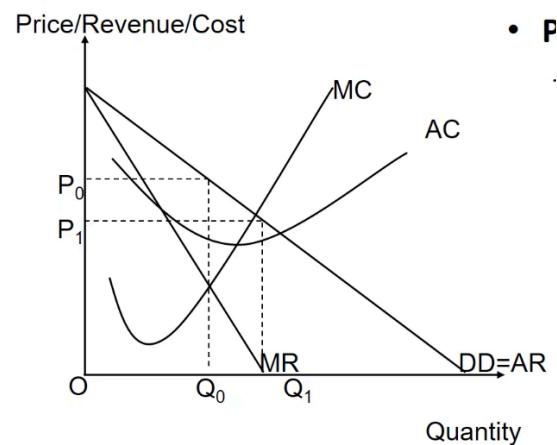
	<b>PC</b>	<b>MPC</b>	<b>Oligopoly</b>	<b>Monopoly</b>
Barriers to entry (BTE)	No BTE <ul style="list-style-type: none"> <li>• Factors of production are perfectly mobile</li> <li>• No/minimal start-up costs</li> </ul>	Low BTE <ul style="list-style-type: none"> <li>• Low start-up costs</li> <li>• Technology is easily replicable</li> </ul>	High BTE <ul style="list-style-type: none"> <li>• Natural BTE (high fixed costs/start-up costs)</li> <li>• Artificial (achieved through creating perceived/real differences)</li> </ul>	Substantial BTE <ul style="list-style-type: none"> <li>• Natural BTE (high fixed costs/start-up costs)</li> <li>• Artificial (achieved through creating perceived/real differences)</li> </ul>
No. of firms Size of firms Market share (measured by market concentration ratio)	Many small firms with insignificant market share (CR <sub>4</sub> = V. low %)	Many small firms with insignificant market share (CR <sub>4</sub> = V. low %)	Few large firms with significant market share ( <u>high mkt concentration ratio</u> ) (CR <sub>4</sub> = large %)	Single large firm with total market share (CR <sub>1</sub> = 100%)
Nature of product	Homogeneous (identical product)	Differentiated (in terms of quality, design, branding)	Homogeneous Differentiated	Unique (no substitutes)
Knowledge	Perfect	Imperfect	Imperfect	Imperfect
Independent/ interdependent	-	Independent	Mutual interdependence	-
Strategies	Cannot adopt price strategies <u>Why?</u> Cannot set its own price but can determine its own output level (profit-max)	Can adopt price, non-price, and cost strategies Prefer non-price strategies	Can collude or compete; can adopt cost strategies and growth strategies If compete, prefer non-price competition over price competition	Can adopt price strategies, cost-reducing strategies and growth strategies

**6.1 PRICING STRATEGIES** refer to firm's plan for setting the price of its product given the market condition it faces and its desire to achieve a specific aim or objective (ex. maximise profits)

- PC firm – **price taker**; firms in imperfect market structures – **price setter** (control over own price)
- By setting prices, firm accepts corresponding QD to price indicated by firm's demand curve (i.e. cannot set both price and quantity)
- Pricing strategy for firms with market power is complex; many pricing strategies price setters use
  - Ex. uniform pricing, price discrimination, predatory pricing, limit pricing

→ **Uniform pricing** – assume that the firm in imperfect market structure charges the same price for the same good sold to all customers/sells all units of its output at the same price

- Maximise profits: price-setter set price at  $P_0$  and output level  $Q_0$  where  $MR = MC$ 
  - Uniform pricing means that all units of output up to  $Q_0$  is sold at  $P_0$
- Maximise TR: set price at  $P_1$  and output level  $Q_1$  where  $MR = 0$
- Achieve profit-satisficing objective: firm choose to price product between  $P_0$  and  $P_1$ 
  - Satisfy profit target + consider other factors; X maximising  $TR/\pi$ , achieving mix of objectives
  - If firm seeks minimum level of profits + try to increase market share → set price between  $P_0$  and  $P_1$  and produce between  $Q_0$  and  $Q_1$



→ **Price discrimination** – 3 essential conditions: p-setting firm w market power practices price discrimination

- **Price discrimination** occurs when a producer sells the same good at different prices whereby the price difference does not reflect differences in the cost of supplying the customer

Objective of price discrimination – allows price-setting firm (monopolist) to capture consumer surplus and earn higher total revenue, and in turn, ceteris paribus, higher profits from sale

- Firm with market power p discriminates, earn more economic  $\pi$  than firm charging uniform price
- Consumers willing to pay more are charged higher prices, transfer of consumer surplus to producers in the form of higher revenues and higher profits (recall CS: willingness to pay – price paid)

3 necessary conditions for price discrimination

<b>1. Seller must have market power (monopoly power)</b> to have the ability to price discriminate <ul style="list-style-type: none"> <li>• Price-setter (X price taker); includes firms in MPC, oligopoly, and monopoly market structures</li> <li>• X market power, firm X choose price, much less choose to charge different p to different consumers</li> </ul>
<b>2. Ability to identify and segment market into separate groups based on differences in PED</b> <ul style="list-style-type: none"> <li>• Firm must be able to <u>distinguish among buyers willing to pay different prices</u> for p discrimination to be profitable; individual/group with <u>relatively lower PED charged a higher price</u> (less p sensitive)</li> </ul>
Ex. train companies – able to segment market for rail travel into student groups and adult groups <ul style="list-style-type: none"> <li>• Train company able to identify and separate students from adults as students are required to produce their identification card upon request when they use their concessionary train tickers</li> <li>• Charge students lower fare than adults; students have <u>higher PED</u> as fares are typically a <u>larger proportion of their income/allowance</u></li> </ul>
Ex. early-bird discount strategy – low-cost airlines market, airline companies segment market by time <ul style="list-style-type: none"> <li>• Customers booking early (ex. with carriers like AirAsia) charged lower prices if they are prepared to commit themselves to a flight by booking early           <ul style="list-style-type: none"> <li>○ Why? more likely price-sensitive buyers who plan meticulously (take time and effort to shop and compare prices), plan ahead: <u>more likely that substitutes</u> (other airlines/modes of transport) are avail, <b>PED more elastic</b></li> <li>○ Discount, airline hopes <u>more than proportionate increase in QD, increase total revenue and profits</u>, ceteris Par.</li> </ul> </li> <li>• Customers booking closer to date &amp; time of scheduled flight, charged higher prices           <ul style="list-style-type: none"> <li>○ Why? typically have <u>relatively lower PED</u> as <u>fewer no. of substitutes</u> (seats and flights) available; less time to search for substitutes (smaller time horizon)</li> </ul> </li> </ul>
<b>3. Prevent (no possibility of) resale and arbitrage between different markets/among themselves</b>

- Why? customers able to buy good at low price can resell good to other customers who would otherwise have had to buy the product from the firm at a higher price
- **Arbitrage** – practice of buying good at lower price then reselling it at a higher price
- Ex. train company prevent resale by printing student's name and other details on concessionary train tickers

Impact of arbitrage – cause firm's attempt at price discrimination to break down

- Ability to engage in arbitrage makes all consumers better off
  - Why? low-price consumers make profit on resale, high-price consumers purchase product at lower price than what the firm charges
- Firm X better-off; eventually can only sell to those who want to buy it at the lowest price
  - Firm back to traditional situation of charging uniform price to all consumers instead of charging different prices to different consumers for the same good

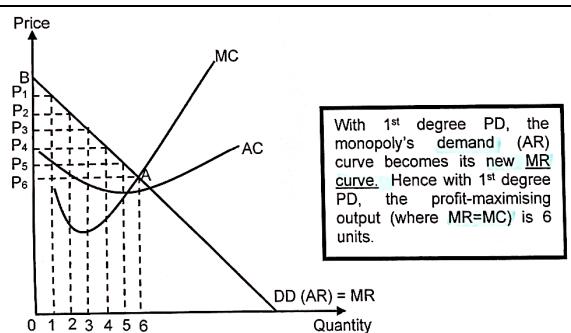
Types of price discrimination – includes first-degree (perfect price-discrimination/personalised pricing), second-degree price discrimination, third-degree price discrimination

**First-degree/perfect price discrimination** practice of charge each customer the maximum price that he is willing to pay for each unit bought

- Why? ideal situation: firm charges each consumer maximum price he/she willing and able to pay for each unit (i.e. charge different prices for each unit sold), firm able to capture all consumer surplus (i.e. consumer surplus = 0)
- Less price sensitive (lower PED), more willing to pay higher price, charge higher price

Graphical representation

- Monopoly's demand (AR curve) is new MR curve ( $\pi$ -max output (where  $MR = MC$ ) = 6 units)
- All consumer surplus  $P_6BA$  transferred to the monopoly: each unit sold based on willingness to pay indicated by demand (AR curve) [ $P_1$  for first unit,  $P_2$  for second unit]
- Why AR = MR curve? consumer charged exactly what he is willing to pay, MR/incremental revenue earned from each additional unit sold is price (AR) paid for that unit



Limitations of first-degree price-discrimination – almost never possible

- Impractical to charge each customer a different price
- Customer X reveal maximum price he is willing to pay for each unit of good (normal circumstances)

Ex. of first-degree price-discrimination (auction, bargaining process)

- Auction sites: one's bid determines the maximum price that one is willing to pay for the good

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**Second-degree price discrimination** is a pricing strategy where firms charge a different price to different groups of customers buying the same product by offering them various pricing choices and allowing them to choose among the different options

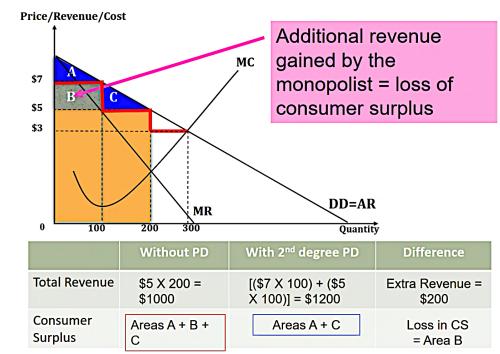
- Undertaken when firms are X able to segregate customers based on observable characteristics (e.g. age, geographical location, past purchasing behaviour)

Ex. quantity discounts

- NTUC FairPrice charges customers \$2 for a bag of 4 apples; \$0.80 for one apple
- Customers buying larger quantities tend to have higher PED → why? more money involved, expenditure likely form a larger proportion of income
- NTUC X able to tell in advance who will buy larger quantities, offers customers various pricing choices, allows customers to choose among them

Ex. concert ticket pricing

- Organiser of concert X knowledge on purchasing power/PED of potential customers; ideally charge wealthier customers/die-hard fans higher price due to price inelastic demand
- To reveal their PED – higher p for seats closer to stage
  - Lower PED group select expensive tickets due to perceived difference in concert experience (might be superficial)
  - Higher PED group (more price sensitive) select cheaper tickets, arguable enjoy same view



**Third-degree price discrimination** is a pricing strategy whereby the firm charges a different price to different groups of customers buying the same product by segmenting the market based on identifiable characteristics of these groups and the PED is different between these groups

- Firm must be able to directly identify specific groups with different price sensitivities (PED) before purchase based on identifiable attributes; X able to identify demand of every individual customer

Common ways of segmenting market

### 1. Customer characteristics

- PED differs: age (student/senior citizen discounts @ movies), nationality (foreigner vs local)
- Ex. train companies practice p discrimination, segment rail travel market into student & adult grp
  - Students – lower fare as higher PED, larger proportion of income/allowance
  - Train company able to identify + separate students from adults as students are required to produce their identification card upon request when using concessionary train tickets

### 2. Location

- Customers have a hard time getting to another to take advantage of lower price or X have knowledge of prices in other locations → sellers take advantage of customers' lack of accessibility/knowledge by charging different prices in different locations depending on PED of local demand
- Ex. train fares in some countries: passengers in central areas charged lower fares vs those in suburbs as there are more alternative transport options available in central areas, higher PED

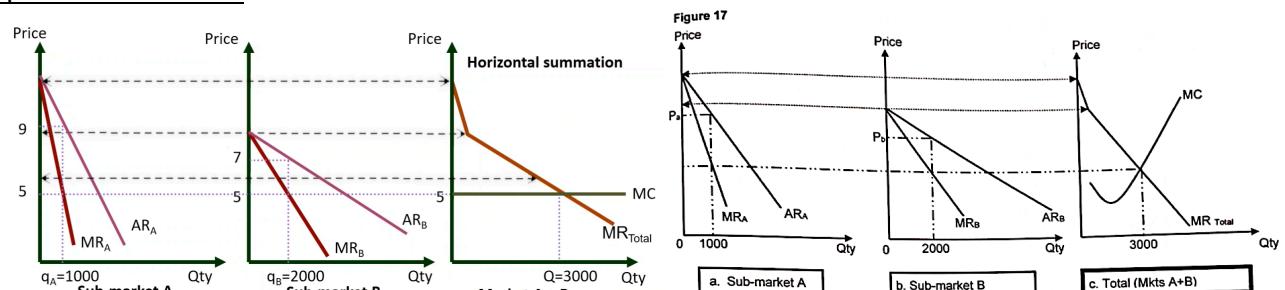
### 3. Past purchasing behaviour

- Ex. auto insurance industry – special discounts to new customers (reduced premiums during 1<sup>st</sup> policy period); charge existing customers the non-discounted rate
- Why? existing customers relatively lower PED, X willing to spend time and effort searching for better deals/alternatives as they assume they already have the best deal

Firms' output and pricing decision making process

- Total output for each group when **MR = MC**
  - If not, firm increase profit by increasing or reducing total output
- Maximise  $\pi$ : total output divided between two sub-markets Group A's MR = Group B's MR
  - If A's MR exceeds B's MR, firm clearly does better by shifting more output to A (by lowering price for A and raising price for B)

Graphical illustrations

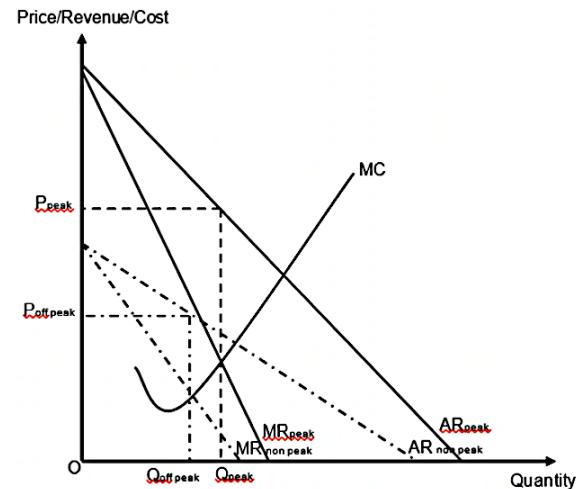


- Firm practices p discrimination in 2 markets A and B; C shows MC & MR for firm as a whole
  - Firm's overall MR curve is the horizontal summation of MR curves in two sub-markets
- Step 1 – determining profit maximising Q to produce

- $\pi$ -max total Q is determined by intersection of MC and MR curve for total market (A + B)
- **MC = MR<sub>A</sub> + MR<sub>B</sub>**: draw horizontal line from c leftwards to determine Q in each sub-market
- Ex. total Q = 3000 units, A = 1000 units, B = 2000 units
- A : 1000 units at higher price P<sub>a</sub>; B: 2000 units at lower price P<sub>b</sub>
- Step 2 – distributing Q between A and B
  - Total  $\pi$  maximised at total Q of 3000 units; output divided between sub-markets such that
  - **MC = MR in each market**; MR in market A = MR in market B
    - If MR<sub>A</sub> > MR<sub>B</sub>: sell in market A; If MR<sub>A</sub> < MR<sub>B</sub>: sell in market B
    - $\pi$ -max achieved when MR<sub>A</sub> = MR<sub>B</sub> for last unit sold in respective markets
- Step 3 – determining price to sell Q<sub>A</sub> and Q<sub>B</sub>
  - Relative prices charged based on differing price elasticities of demand
    - A: demand relatively less price elastic, higher price charged
    - B: demand relatively more price elastic, lower price charged
- Note: price differentials can be a combination of cost differences and price discrimination
  - Some price discrimination exists if cost differences X fully account for diff. in goods' p

### Case study 1 – peak load pricing (inter-temporal price discrimination)

- Peak load pricing – people are charged more at times of peak demand and less at off-peak times
- Ex. holiday (high season prices have considerably higher prices than low season prices), air fares, prices in cinemas and restaurants (higher in evenings), lower prices for early birds, happy hour, weekday movie tickets, off-peak hours for road usage, air tickets during school holidays, ski resorts and amusement parks during weekends



### Why peak load pricing is considered/not considered a form of price discrimination

- Higher prices charged at peak times partly due to PED (lower PED at peak times)
  - Ex. people watch movies during weekends, school/work next day
- Higher prices due to higher marginal costs incurred at peak times; X true to p discrimination
  - Fixed factors (plant and equipment), MC likely to rise as Q expands to meet higher demand
  - Due to diminishing returns (LDMR) to variable factors OR use of additional equipment with higher operating costs
  - Ex. watching cinema during weekdays vs weekends – off peak times, cinemas have 2 counters open for ticket sales; periods of high demand – open more counters/hire extra staff for crowd control → MC of operating at weekends higher than weekdays

### Reasons why price is higher for peak period (2 reasons)

- First – demand/AR under peak period is less price elastic than demand/AR under non-peak period
  - Price is higher percentage above MR in peak period than in off-peak period
- Second – marginal cost is higher in peak period

### Case study 2 – air tickets

### Is the price differences an example of price discrimination?

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	Questions Justify you answer. "Yes/No. This is because ... "	Explain why and/or how.	The price difference could be due to price discrimination if your answer is a:
1	Are there cost differences in providing economy class, business class, first class seats and services?	Yes/No. This is because...	No
2	Are they the same goods?	Yes/No. This is because...	Yes
3	Can the airline company segment its market into individual customers or groups of customers with different PED?	Yes/No. This is because...	Yes

Note: There are times price differentials can be a combination of cost differences and price discrimination. In such an instance, elements of price discrimination exist if the difference in costs does not fully account for the difference in price of goods.

Does the airline have the ability to price discriminate? Address these essential questions:

1	Does the airline company have monopoly power?	Yes/No. This is because...	Yes
2	Can the airline company prevent resale and arbitrage?	Yes/No. This is because...	Yes
3	Can the airline company segment its market into individual customers or groups of customers with different PED?	Yes/No. This is because...	Yes

Students must be able to explain whether the example illustrates price discrimination.

## Price Discrimination

	1st Degree	2 <sup>nd</sup> Degree	3 <sup>rd</sup> Degree
Conditions		<ul style="list-style-type: none"> <li>Market Power</li> <li>No Resale or Arbitrage</li> <li>Market Segmentation with differing PED values</li> </ul>	
Knowledge of each consumer's reservation price	Firm is unable to segregate groups of customers based on observable characteristics. Rely on each group to reveal their willingness to pay	Firm is able to segment customers into groups based on observable characteristics like age	
Transfer of CS	Total	Partial	Partial
Examples	Auctions, Bidding	Quantity discounts	Senior citizens vs Student concessions

Note: Classification of PD into different degrees is not required but it aids our understanding of concept

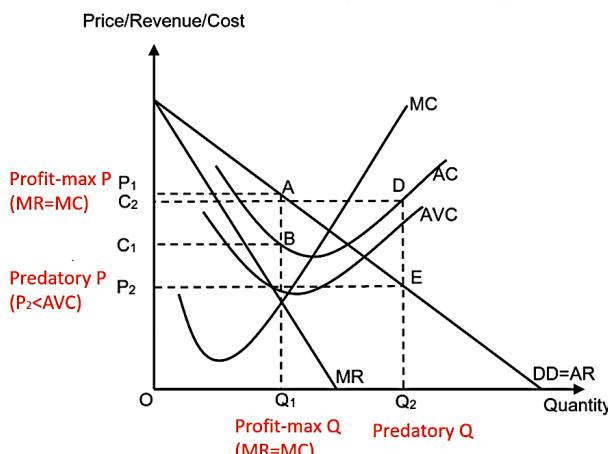
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### → Price Competition: predatory pricing, price wars, limit pricing

Predatory pricing is a deliberate strategy of driving competitors out of the market and scaring off potential entrants by setting very low prices or selling below its average variable costs in the short run ( $P < AVC$ )

- Dominant firm charge  $P < AVC$  in SR
- Force smaller rival firms who X match prices to leave industry in LR

### ANSWERING TECHNIQUES



- $P_1$  and  $Q_1$  are profit-maximising price and output levels respectively
- $P_2$  and  $Q_2$  are the predatory P and Q levels; firm makes loss of area  $C_2DEP_2$  at  $P_2$ 
  - Force one/more competitors to leave market if competitor(s) X match price reduction in LR
- Firm's ability to charge price below  $AVC$  and continue to survive in market
  - Depends on retained/past profits to tap upon to cover losses in current period
- Result – existing firms driven out and entry of new firms deterred

- Remaining incumbent firm can raise price to profit-maximisation levels
- Predatory pricing is illegal under competition laws of most countries but difficult to prove

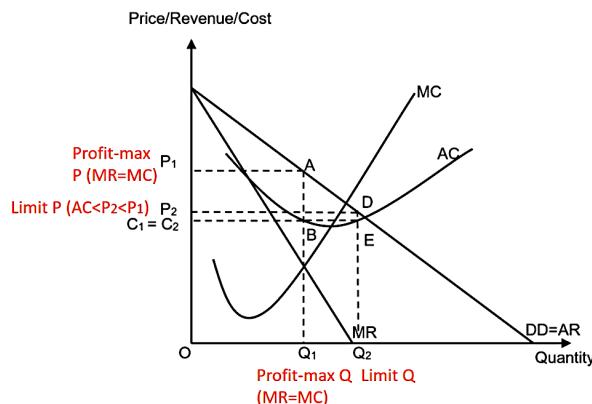
Price war – when suppliers attempt to undercut one another's prices to achieve greater market share

- Oligopoly firms under-cut each other's prices as a means of **competing for market share**

Limit pricing – pricing by incumbent firm(s) to deter entry or expansion of fringe firms by setting a price below profit-maximizing price but above competitive level

- Charge a price close to P = AC; potential entrants make sub-normal πs if they enter industry
- **Deter entry of new firms**

#### ANSWERING TECHNIQUES



- Limit pricing means a short run departure from profit-maximisation
- How limit pricing is effective in preventing entry?
  - Firm willing to sacrifice profits in SR, price lower at  $P_2$  & sell higher output at  $Q_2$ ; total profit at  $Q_2$  is lower than at  $Q_1 \rightarrow$  potential rival firm decide risk of entering industry is too high
  - Why? potential rival firms start on smaller scale of production, incur higher unit costs  $\rightarrow$  may make sizeable loss, X resources to sustain those loses before reaching competitive level of average cost through scale economies
- If successful: existing firm maintains market power, continue to retain supernormal profits over LR

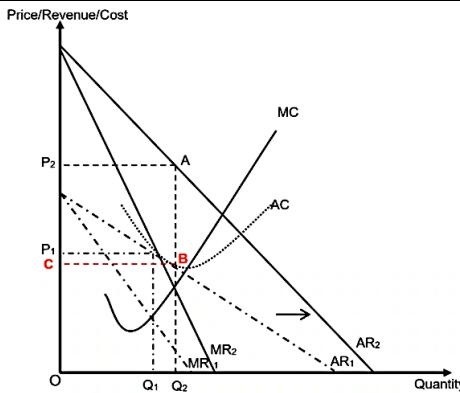
**6.2 NON-PRICING STRATEGIES** form of competition requiring firms to focus on product differentiation instead of pricing strategies among competitors

- Include non-price competition (marketing strategy involving marketing a firm's brand and quality of products, rather than lowering prices)
- Advertising – attempts to add value to a product by changing our perception rather than the product
- Product innovation – adds value by significantly improving the physical characteristics or intended users of the product; improving on the quality and range of customer service
- Superior location; factors affecting location of firms
  - Ex. customers, costs, suppliers, labour, government assistance
- Depending on market structure, strategies may be executed differently

#### → Advertising and promotion

- Aim – to increase demand for products (increase revenue), reduce PED
- How? perceived differences created through advertising
  - Inform, persuade and convince consumers to purchase their products
  - Stress specific qualities of the firm's product over its rivals
- Results of successful and consistent advertising
  - Create brands that consumers aspire to own
  - Strengthen brand loyalty: shorten search process for consumers looking for consistent quality
  - Decrease in substitutability, demand become relatively price inelastic, firms have greater leeway to raise prices without fear of a loss of market share

#### ANSWERING TECHNIQUES



- Advertising increases demand for firm's product + makes demand relatively price inelastic
  - AR curve shifts from  $AR_1$  to  $AR_2$ ; MR shifts from  $MR_1$  to  $MR_2$
- As firm profit-maximises where  $MR = MC$ , new profit-maximising price and output is  $OP_2$  and  $OQ_2$ 
  - Results in increased profits for firm (previously normal profits), firm earns supernormal profits of area  $P_2ABC$
- Reduce substitutability between firm's product and rivals' product
  - Lower absolute CED value for firm's product: price of rival substitute falls, reduce extent of fall in QD for firm's product when rivals reduce prices of their products, ceteris paribus.
  - Reduce extent of leftward shift in demand curve for firm's product when rivals lower prices, reduce extent of fall in QD for firm's product at a given price, cushion fall in TR and  $\pi$ s

Limitations – advertising and promotion (R&D inclusive) incur fixed costs

- Advertising considered successful only if the increase in TR outweighs increase in TC

Advertising and promotions across market structures

MPC firms – do not earn supernormal profits in LR due to absence of BTE

- Advertising and promotion are usually smaller in scale
- Entail distribution of flyers & brochures, having banners/signs near stores, train/bus stations to direct customers to their store **OR** change/refresh packaging of product to appeal better to consumers

Oligopoly/monopoly – oligopolists/monopolists can earn supernormal profits in LR due to presence of BTE

- Have substantial funds to do large scale advertising campaigns
- Ex. TV advertising, social media advertising, print media advertising (magazines, newspapers) **OR** run joint advertising campaigns, marketing their goods/services jointly with related firms (credit cards)

## → Research and development leading to product and process innovation

- Include activities companies undertake to innovate and introduce new products and services

Product innovation adds a new feature to an existing product/service

- Involves market & customer needs research & developing new products (Fitbit, Amazon's Kindle) and improved products & services (improvement in digital resolution in iPhone 11) to meet these needs
- Impact of businesses with R&D strategy:** capture larger share of market + increase TR &  $\pi$ , ceteris paribus, greater chance of success; competitors take time responding with similar improved products
- Limitations:** spending more time & money on R&D X guarantee it will be successful
  - Key to successful R&D is extensive market research to identify needs and desires of consumers → firm need to review its research regularly
- Industrial, technological, health care and pharmaceutical sectors incur highest R&D expenses
  - Ex. successful major drug companies almost wholly depend on the discovery and development of new medicines

Process innovations are activities to develop existing and new business processes

- Impact:** improvement in productivity, reduce costs of production, ceteris paribus. increase in profits
  - Lower LRAC and LRM<sub>C</sub> (downward shift) → 1. Increase profits 2. Better able to wage price war/practice limit pricing → higher BTE
- Include changes in equipment and technology used in manufacturing (Ex. software used in product design and development), improvement in tools, techniques and software solutions used to help in

supply chain and delivery systems, changes in tools used to sell and maintain your good, methods used for accounting and customer service

- Ex. Henry Ford's invention of world's first moving assembly line: simplified vehicle assembly + shorten time necessary to produce a single vehicle from 12 hours to 90 minutes
- Ex. airlines → e-tickets; machinery industry → web-based customer service; banks → online banking; electronic company → content provider

### 6.3 COST-REDUCING STRATEGIES – classify process innovation under cost-reducing strategies

→ **Fixed costs:** move to cheaper location to reduce rent, lowering fixed costs (downward shift of SRAC curve)

- Fall in fixed cost leads to fall in its AC, ceteris paribus, leads to an increase in profits
- MC curve does not fall as rent is a fixed cost while MC is a variable cost concept
- Profit-maximising price and output level does not change

→ **Variable costs:** source for cheaper inputs, reduce variable cost (downward shift of SRMC and SRAC curve)

- Fall in variable costs lead to fall in both its AC and MC, ceteris paribus, profit-maximising price falls, profit-maximising output level increases and total profits increases

→ **iEOS:** increasing scale of production, more fully exploit available internal economies of scale

- Firms can band together/set up jointly owned enterprises to source for raw materials, allowing them to obtain many of the internal economies of scale enjoyed by larger firms (Section 4.1)
- Refer to Section 3.2.2 and Section 6.4 (growth strategies)

→ **eEos:** businesses in the same industry cluster together to enjoy economies of concentration (type of eEos)

- Refer to Section 3.2.3b

## 6.4 GROWTH STRATEGIES

- Firms grows by producing more of its existing products/extending range of products it sells
- **Internal growth** – when firm grows within framework of its existing management & control structure
- **External growth** – occurs through mergers and acquisitions
  - **Merger** – occurs when a firm combines with one or more existing firms to form an entirely new enterprise or by buying over another firm
- To obtain funds for growth, firms 1. Reinvest profits 2. Borrow from banks 3. Initiate an Initial Public Offering (IPO) on stock exchange

→ **Mergers and acquisitions** – include horizontal integration, vertical integration, and conglomeration

- Mergers – two businesses of similar size and scale of operations combine into one new company
- Acquisitions – one business buys another (often) smaller businesses
- Vertical (diff. supply chain stages), horizontal (same industry), conglomerate (diff. industries)

**Horizontal integration** – occurs when a firm combines with/takes over a similar firm at the same stage of production to form a single entity

### Cost and revenue advantages of newly merged firm

- Aim 1 – no. of firms producing same product merges to form a larger firm, scale of production expanded towards minimum efficient scale, joint production capacity allows new firm to more fully exploit available internal economies of scale, **lower long run unit costs of production**, increase πs
  - iEOS – technical, managerial, financial and research and development economies
- Aim 2 – **market share dominance**; no. of firms producing same product merge to form larger firm, reduction in competition, enjoy increased demand (due to increased consumer base), increased market share, increased market power, demand less price elastic, increased ability to raise price over marginal cost of production, ceteris paribus, increase in total revenue and in turn profits
- Aim 3 – reduce duplication → lower costs
- Ex. merging of different car companies, airlines, or banks

### Potential problems newly merged firms face

- Internal diseconomies of scale set in if expansion occurs beyond MES
  - Higher LRAC as scale of production increases, lower profits
- Anti-trust laws

**Vertical integration** – occurs when a firm combines with/takes over another firm at a different stage of production (i.e. company controls more than one stage of the supply chain)

**Forward integration** – occurs when a firm moves into succeeding stages of production and gains ownership over other companies that were once customers

- Ex. breweries buying up pubs, iron miners owning ‘downstream’ activities (steel factories), clothing manufacturer opening own retail location to sell product

### Cost and revenue advantages of forward integration to newly merged firm

- Aim – lower uncertainty wrt access to markets, **improve supply chain coordination**
  - How? firm more control over way product is presented, distributed, & price sold in market
- Why 1? Crucial when operating in industries lacking qualified distributors
  - Closer to customers & tighter quality control over manufacture and distribution of end products where there is a lack of qualified manufacturers/distributors that adversely affect demand, and in turn revenues and profits → higher revenue
- Why 2? Eliminate late/inefficient deliveries, cut out distributors charge sig. costs, lower costs
  - Forward integration removes cost paid to distributors, lead to higher profits, ensure **strategic independence** of company from 3<sup>rd</sup> party
  - How cost is reduced – cutting out middlemen (paid to sell company’s products), cost lowered, overall profitability improved [types of costs reduced/removed: transportation costs, transaction costs, business-to-business marketing costs]
  - Ex. online stores (Amazon, Chinese e-commerce giant: Alibaba) enable manufacturers to sell directly to customers anywhere, anytime, create a new centre of earnings
- Why 3? Allow company to set itself apart from its competitors

- Ex. company manufacturing electronic establish itself as a retailer providing an experience for its customers that its competitors cannot
- Ex. Apple opened first retail store in 2001 to cater to customers in a way Microsoft could not; helped increased demand for Apple products and in turn its revenue and profits
- Why 4? iEOS but scope of iEOS tends to be less than horizontal integration

### Potential problems newly merged firms face

- Danger of diluting core competencies and business; internal diseconomies of scale

**Backward integration** – occurs when one firm merges with another firm involved in the previous/earlier stage of production (business at end of supply chain takes on activities 'upstream')

### Cost and revenue advantages of backward integration to newly merged firm

- Aim 1 – Increases ownership over companies that were once its suppliers, **lower uncertainty** in securing factors of production, improving supply chain coordination
  - Why? Greater control over quantity & quality, costs and delivery of scarce FOP inputs to its warehouse → avoid supply disruption, reduce costs & greater certainty over costs of FOP
  - Importance – quality determines final products' quality, demand, revenue & πs
- Aim 2 – entry deterrence, restricting availability of suppliers of critical FOP to potential competitor
  - Why? prevent demand for products, and in turn revenue and πs from falling
  - Ex. retailer might buy manufacturing company to gain access to proprietary technology, patents, resources only available in the firm's local area
- Aim 3 – experience reduction in its costs, and in turn gain in profits
  - Why? suppliers sell products to retail at profit-maximising price; retailers circumvent suppliers, acquire FOP at cost price, reduce overall cost → especially important if suppliers have a lot of market power, push up prices of FOP above MC
- Aim 4 – prevent slowdown in production due to negotiations/other external aspects, increase πs
- Aim 5 – iEOS, but scope of iEOS tends to be less than horizontal integration
- Ex. oil refineries buying up oil wells; Amazon expanding from an online retailer of books to become a publisher with its Kindle platform; Amazon owning warehouses & parts of its distribution channel

### Potential problems newly merged firms face

- Heavy investments in acquiring factories; lack of supplier competition, lower efficiency, potentially higher costs; internal diseconomies of scale

Ex. Ford Motor Company created subsidiaries providing key inputs to vehicles (rubber, glass, metal)

- Ensured Ford X hurt by suppliers 1. providing materials of inferior quality, lead to fall in demand, revenue, and profits 2. Holding out for higher prices, lead to higher costs of product, fall in πs

### Conglomeration

– conglomerates are companies selling goods not directly related to one another

- Ex. General Electric (GE: highly diversified conglomerate with expansive interests) – financial services, aviation, healthcare, engineering, oil, and gas

### Cost and revenue advantages of conglomeration to newly merged firm

- Why 1? grow and expand into conglomerates for diversification purposes, more stable cash flows
  - GE's revenue X overly affected by decrease in demand for any one of its good and services, reduce uncertainty and risks (recession: significant decrease demand for certain products)
- Why 2? Expanded customer base, increases total revenue
- Why 3? iEOS but scope of iEOS tends to be less than horizontal integration

### Potential problems newly merged firms face

- No experience in other industry; internal diseconomies of scale

### Examples

- Ex. farmer produces whole range of vegetable products, diversifies into livestock
  - Less subject to adverse weather conditions, unpredictability of specific market
- Ex. insurance companies diversify to deal with uncertainty
  - Offers more types of insurance (car, house, life, health insurance), reduce risk of having significant pay-out costs, and in turn, decreases in profits due to a single event

→ **Franchising** – practice of selling the right to use a firm's successful business model and brand for a prescribed period of time (one way for firms to grow internally)

- Why 1? quickly expand/build 'chain stores', avoid risk of investing significant amounts of capital
- Why 2? Brand proliferation, build brand presence, reduce search costs for consumers, increase revenue by collecting fees from franchisees
- Why 3? Reap marketing economies, spreading significant advertising cost across many franchisees, bargaining for lower prices for factor inputs

Ex. McDonalds – over 15, 000 restaurants

- Each franchisee license is valid for 20 years and renewable after that
- To promote consistency, it can be cancelled any time if the restaurant fails the company's standards of quality, pricing, and cleanliness

## 6.5 ALTERNATIVE MODELS ON PRICING – include mark-up pricing & full-cost pricing (X thesis/antithesis)

- $\pi$ -max model assumes that all firms have perfect information on their costs (MC) & revenue (MR)
- Flaw – real-world firms X bother about calculation of marginal revenue and marginal costs
  - X know DD and MR curves faced by them; X possess adequate information on cost structure

→ **Mark-up pricing** (cost-plus pricing) – widely used in retailing where retailer wants to know with some certainty what the gross profit margin of each sale will be; price at X% above average total cost

- Advantages of such a system
  - Certainty of per unit profit margin, simpler to implement as less information is required, not profit-maximising except by coincidence
- Ex. UK: standard retail mark-up is 2.4 times the cost retailer pays to its supplier; firms wish to ensure that it makes 2.4 times its unit cost of production, cost of supplying product = 10 pounds, retailer sells it at 24 pounds → total mark-up of 14 pounds (selling price of 24 pounds less the wholesale cost of 10 pounds)

Types of costs considered by the firm

- Full-cost pricing – firm seeks to set a price that considers all relevant costs of production (including fixed costs and variable costs) and mark it up by a certain no. of times the COP
- Advantage – business knows that all its costs are being covered

## 6.6 CONCLUSION

- Understand objectives of firms, costs & revenue condition, and nature of market structure
- Recognise that with each decision made by the firm, there are always business risks and uncertainties associated with these decisions [ex. change in government regulation aiming to liberalise market and remove BTE, greater uncertainty for existing firm with large market power]
- Decision-making process needs to account for uncertainty of influx of rival firms; business cycle volatility present firms with unpredictable challenges related to demand for their products
- Firms constantly engage in decision-making processes and make changes to their business strategies.

### SECTION SUMMARY

- Firms undertake various strategies based on their objectives and constraints
- Price discrimination is undertaken by firms with market power to increase their total revenue and profit
- The strategies of firms also depend on the contestability of the market which is the next section
- Besides describing the strategies, it is important to assess them

## 7. ASSESSING PERFORMANCE ACROSS DIFFERENT MARKET STRUCTURES

### 7.1 CRITERIA FOR ASSESSING PERFORMANCE/DESIRABILITY

The performance/desirability of a market structure is assessed in terms of the impact on

- Economic efficiency (allocative efficiency and productive efficiency)
  - Market failure – firms that fail to attain economic efficiency
- Dynamic efficiency (result of innovation)
- Equity; consumer choice

#### Economic efficiency

- Static efficiency – level of efficiency at a given point in time, holding technology constant

**Allocative efficiency** is the situation in which the society produces and consumes a combination of goods and services that maximises its welfare

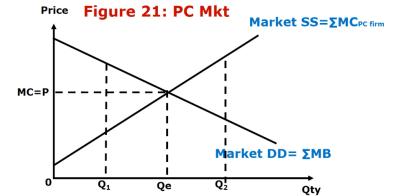
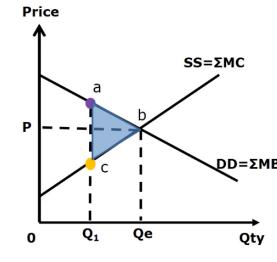
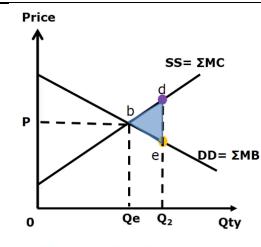
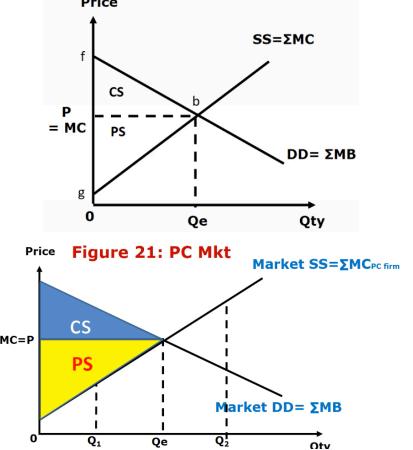
Condition for allocative efficiency: **price = marginal cost of production**

P = marginal utility (MB) of consuming last unit of good

MC = marginal cost/opportunity cost incurred in producing last unit of good

- Achieved when goods and services wanted by the economy are produced in the right quantities; refers to allocation of scarce resources that yields the right mix and quantities of goods and services to maximise society's welfare
- Absence of externalities & public goods: allocative efficiency achieved when  $P = MC$  of production

#### Graphical representation – perfectly competitive market

<ul style="list-style-type: none"> <li>• Equilibrium output <math>OQ_e</math> and price <math>OP_e</math> determined by interaction between market demand &amp; supply</li> <li>• At market eq. price, <math>QD = QS</math>, allocative efficiency <math>P = MC</math> achieved</li> </ul>	 <p>Figure 21: PC Mkt Market SS = <math>\Sigma MC_{PC\ firm}</math> Market DD = <math>\Sigma MB</math></p>
<ul style="list-style-type: none"> <li>• At output <math>OQ_1</math>, price (reflects MB/utility derived from consuming additional unit) greater than MC                     <ul style="list-style-type: none"> <li>◦ Society values last unit of good <u>more than opportunity cost</u> of producing that unit; benefit if <u>more units of goods</u> were produced, <u>under-production by <math>Q_1 Q_e</math></u>, <b>deadweight loss</b> of area abc, monetary value of all units under-produced causing <math>MB &gt; MC</math></li> </ul> </li> </ul>	 <p>Figure 21: PC market SS = <math>\Sigma MC</math> DD = <math>\Sigma MB</math></p>
<ul style="list-style-type: none"> <li>• At output <math>OQ_2</math>, price (MB derived from consuming additional unit) less than MC of producing it                     <ul style="list-style-type: none"> <li>◦ Society values last unit of good <u>less than opportunity cost</u> of producing that unit, benefit if <u>fewer units produced</u>, <u>over-production of <math>Q_e Q_2</math></u>, <b>deadweight welfare loss</b> of area bde (monetary value of all units over-produced causing <math>MB &lt; MC</math>)</li> </ul> </li> </ul>	 <p>Figure 21: PC market SS = <math>\Sigma MC</math> DD = <math>\Sigma MB</math></p>
<ul style="list-style-type: none"> <li>• At <math>OQ_e</math>, <u><math>QD = QS</math>, price = marginal cost</u>, allocative efficiency is achieved                     <ul style="list-style-type: none"> <li>◦ Society values consumption of last unit of good <u>equal to opportunity cost</u> of producing it</li> <li>◦ Both <u>consumer surplus (<math>P_e fb</math>)</u> and <u>producer surplus (<math>P_e bg</math>)</u> maximised → welfare optimised, efficient allocation of scarce resources (assume X externalities/sources of market failure)</li> </ul> </li> <li>• Allocative efficiency achieved when marginal social benefit equals to marginal social cost                     <ul style="list-style-type: none"> <li>◦ Concept of externalities and other sources of market failure explored in next topic</li> </ul> </li> </ul>	 <p>Figure 21: PC Mkt Market SS = <math>\Sigma MC_{PC\ firm}</math> Market DD = <math>\Sigma MB</math></p>

**Productive efficiency** is achieved when all resources are fully and efficiently utilised

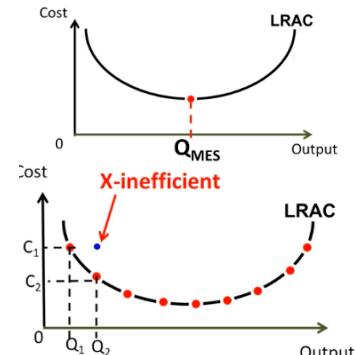
- Defined as the production of goods and services at the lowest possible average cost of production

#### Macro-economic perspective (economy)

- Achieved when resources are used to maximum capacity; fully & efficiently employed (X unemployment/under-employment of resources)
- All points on Production Possibility Curve are productively efficient

#### Micro-economic perspective

- Society – only minimum point on LRAC is productively efficient
  - Point where firm's long run average cost is at its minimum, operating at optimum size (minimum efficiency scale – MES); all internal economies of scale exploited
- Firm – all points on LRAC (X just MES) are productively efficient
  - All points represent lowest possible average cost of producing each given level of output; firm operating above LRAC curve: productively inefficient from firm's POV
  - Profit-max firms must be X efficient



**Dynamic efficiency** – situation where firms are technologically progressive (through investing in R&D for purpose of product and process innovation) to reduce average cost of production and meet changing wants and needs of consumers over time

- Innovation arising from investment of scarce resources into R&D; dynamic as it takes place over time
- Result: improvement in level of technology, **society's welfare increased** with wider range, better quality and increased quantity of products
  - Product innovation: more and better quality output + new products, expand product range
  - Process innovation: improvement in production methods, fall in LR unit cost at every level of output (downward shift of LRAC curve)
- Limitation – uncertainty, explores unknown & untried; not all investment in R&D leads to innovation

**Distributive efficiency (equity)** – fairness in distribution of wealth, income, opportunities and profits

- Idea of equitable distribution is normative (involves value judgement)
- 2 interpretations of equity: 1. Equality of distribution 2. Distribution based on need
  - Equity ≠ equality** (equality – same in quantity, size, degree, value; equity – fairness which is a normative concept and value judgement)
  - Excessive inequality is deemed to be inequitable
- Type of market structure affects distribution of wealth, income and profits

#### Consumer choice

- Desirable in many societies that consumers given freedom to choose from a variety of goods and services, and purchase similar goods from different producers
- Consumer choices available affected by different market structures

	PC	MPC	Oligopoly	Monopoly
BTE	No BTE <ul style="list-style-type: none"> <li>• No/low start-up costs</li> <li>• Only retain normal <math>\pi</math>s in LR</li> </ul>	Low BTE <ul style="list-style-type: none"> <li>• Low start-up costs and technology easily replicable</li> <li>• Only retain normal <math>\pi</math>s in LR</li> </ul>	High BTE <ul style="list-style-type: none"> <li>• High natural BTE (high fixed costs) &amp; artificial BTE (create perceived/real differences)</li> <li>• Retain supernormal <math>\pi</math>s in LR</li> </ul>	High BTE <ul style="list-style-type: none"> <li>• High natural BTE (high fixed costs) &amp; artificial BTE (create perceived/real differences)</li> <li>• Retain supernormal <math>\pi</math>s in LR</li> </ul>
No. of firms Size of firms	Many small firms with insignificant market share ( $CR_4 = N.A. \%$ )	Many small firms with small/low market share ( $CR_4 = NA\%$ ) independent	Few large firms with large market share ( $CR_4 = \text{large \%}$ ) Mutually inter-independent	Single large firm with total market share ( $CR_1 = 100\%$ )
Nature of product	Homogeneous (identical product)	Differentiated (in terms of quality, design, branding)	Homogeneous Differentiated	Unique (no substitutes)
Knowledge	Perfect	Imperfect	Imperfect	Imperfect
Revenue curve	Price-taker <ul style="list-style-type: none"> <li>• DD of each PC firm is perfectly price elastic (<math>AR = MR</math>)</li> <li>• Eq. price determined by market DD &amp; SS</li> </ul>	Independent/ p-setter <ul style="list-style-type: none"> <li>• DD/AR curve of each MPC firm is downward sloping (likewise MR curve)</li> </ul>	Mutual interdependence/ p-setter <ul style="list-style-type: none"> <li>• DD/AR curve of each firm is downward sloping (likewise MR curve)</li> </ul>	p-setter <ul style="list-style-type: none"> <li>• DD/AR curve of each firm is downward sloping (likewise MR curve)</li> </ul>
Strategies	Cannot adopt price strategies <u>Why?</u> Cannot set its own price but can determine its own output level (profit-max)	Can adopt price, non-price, and cost strategies Prefer non-price strategies	Can collude or compete; can adopt cost strategies and growth strategies If compete, prefer non-price competition over price competition	Can adopt price strategies, cost-reducing strategies and growth strategies
Examples	Forex, primary products (agriculture)	Hawker stalls, hairdressers, restaurants	Telcos, airlines, supermarkets, banks, OPEC	Utilities, mail services

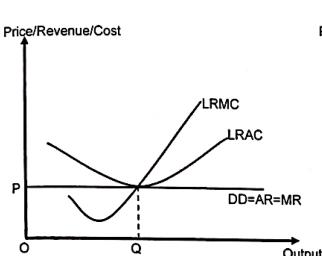
## 7.2 COMPARISON OF PERFORMANCE ACROSS DIFFERENT MARKET STRUCTURE

- Reality – firms are imperfectly competitive (market structures like monopoly, oligopoly, MPC)
- Assessing performance – compared against perfect competition (exist in theory, attains economic efficiency: allocative and productive efficiency)
- LR equilibrium conditions for firms in PC (p-taker) vs imperfect competition (p-setter)
  - Assume firms in imperfect competition make normal  $\pi$ s in LR

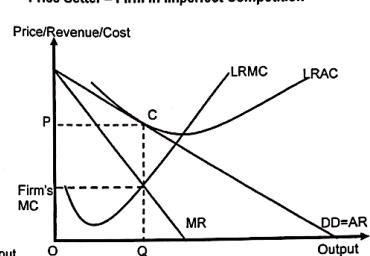
### Allocative efficiency

#### → Firm-based analysis

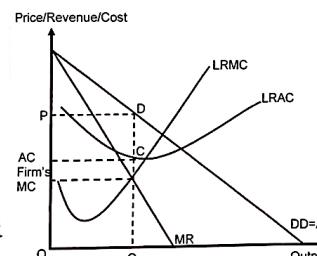
**Figure 22a**  
Price Taker – PC Firm



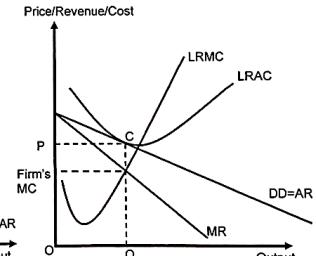
**Figure 22b**  
Price Setter – Firm in Imperfect Competition



**Figure 22c**  
Price Setter – Monopoly or Oligopoly



**Figure 22d**  
Price Setter – Firm in Monopolistic Competition



#### PC firm vs non-PC firm

- PC firm: price-taker, demand is perfectly price elastic;  $P = AR = MR$ 
  - Profit-maximising output level:  $MR = MC$ ,  $MC$  is rising,  $P = MC$ , allocatively efficient
- All firms in imperfect competition: price setter, downward-sloping DD curve (AR curve),  $AR > MR$ 
  - Profit-maximising output level:  $MR = MC$ ,  $P > MC$ , allocatively inefficient

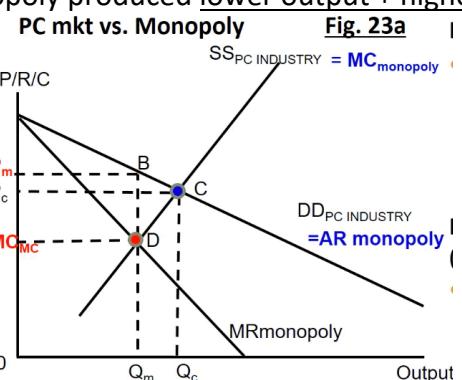
#### Between non-PC firms

- O/M: greater price-setting ability, less price elastic DD curve, steeper AR curve, price exceeds MC by greater extent, more allocatively inefficient, more severe underproduction
- MPC: relatively more price elastic demand + gentler AR curve than monopoly/oligopoly → MPC: many rivals offering close substitutes; monopoly: no close substitutes → MPC is less allocatively inefficient than a monopoly/oligopoly, less severe underproduction
- Price charged by price setter higher than price taker

#### → Industry-based analysis

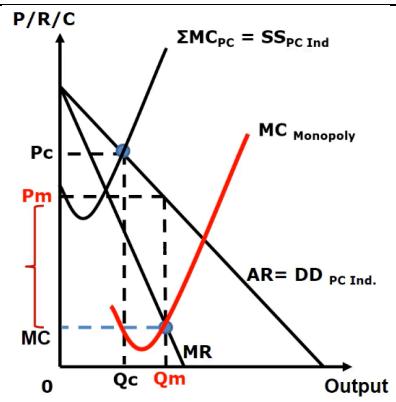
PC industry achieves allocative efficiency as firms are price takers, charge price where  $P = MC$

- Assume similar DD and cost conditions in both market structures
- Perfectly competitive industry, equilibrium output is  $OQ_c$  – market demand equates market supply
  - Absence of externalities and public goods, allocatively efficient level of output,  $P = MC$
  - Value society places on consumption on this unit of good is equal to total opportunity cost of producing it, maximising society's welfare
- Profit-maximising monopolist, produce at output  $OQ_m$  and price  $OP_m$  –  $MR = MC$ 
  - Compared to allocatively efficient PC market, monopoly produced lower output + higher p
- Society's POV – monopoly under-produced by  $Q_m - Q_c$ 
  - Each unit under-produced, benefit to society from consuming additional unit of good is greater than opportunity cost of producing it, better off producing additional unit, welfare loss (deadweight loss) to society arising from under-production of good is area BCD
  - Monopoly is allocatively inefficient, insufficient resources allocated to produce good



Counter-argument – monopolies (depends on nature of industry)

- Despite inefficiencies, monopoly more desirable in industries with substantial EOS to be reaped
  - Industry with large MES, monopolist enjoys significant iEOS, AC falls over a very large output → lower AC, MC of monopoly significantly lower than that in PC industry
  - Ex. rail system, provision of utilities
- PC – industry produces output  $OQ_c$  and sells at price  $OP_c$
- Compared to monopoly, monopoly's profit-maximising equilibrium ( $MR = MC_{\text{monopoly}}$ )
  - Monopoly – higher output and lower price,  $P_m$ , compared to PC industry,  $P_c$ ; consumers enjoy benefits of lower prices with huge EOS in a monopoly
  - PC industry – output  $OQ_c$  still allocatively efficient level of output where  $P = MC$



### MPC firm & oligopoly allocatively inefficient; $\pi$ -max MPC less than oligopoly & monopoly

- $\pi$ -max firms in oligopoly and MPC are allocatively inefficient – price greater than MC at  $\pi$ -max OQ
  - Why? huge price-setting ability, society better-off if additional unit produced as MB of consuming last unit of good produced exceeds its MC

### Why extent of allocative inefficiency of MPC firm limited when compared to an oligopoly/monopoly

- MPC –  $P > MC$  only marginally as AR curve is gentler due to relatively price-elastic demand
  - Why? larger no. of close substitutes available in MPC market
- Oligopoly – inefficiency worsened by anti-competitive behaviour by colluding (act monopoly)
- Oligopolistic competition – result in wasteful use of resources
  - Large-scale advertising to differentiate products and services, resources expended could have been used to produce more goods and services → misallocation of resources
  - MPC – advertise (albeit smaller scale) to differentiate products, increase market share
  - Persuasive advertising – form of economic waste; resources could be put to more productive use (argued to be allocative inefficient)

### Counter-argument

- Advertising, better consumer information (perfect information), market closer to PC model
  - X represent wasteful use of resources as informative advertising educates consumers on
  - 1. benefits and features of products 2. What the product does/can do 3. How the product compares with competing/similar products in value and benefits 4. Where it can be bought
  - Ex. Miller Lite advertisement – informative on how its calories & carbs are much lower than the average light beer (specifically Bud Light)
- Competition produces wasteful duplication
  - Ex. Cup Final on TV; 80% see the game, 20% watch opera; two competing stations, both screen football game → two-channel monopoly, screen match on one channel and opera on the other → monopoly reduces wasteful competition

### **Productive efficiency**

- Society's POV: only PC firm is PE; firm's POV: PC and MPC firm is productively efficient
- Society's & firm's POV: Monopolist and oligopolist firm can afford to be productively inefficient

### Firm's POV

Figure 24a: PC Firm - Price Taker

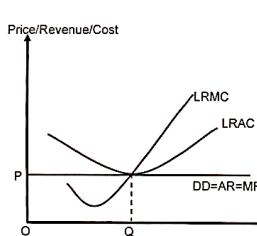


Figure 24b: Firm in Imperfect Competition – Price Setter

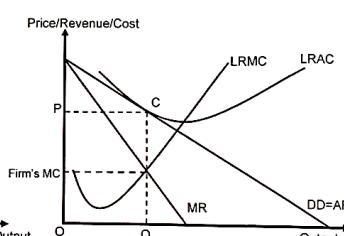
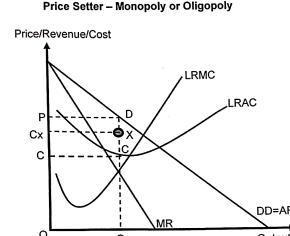
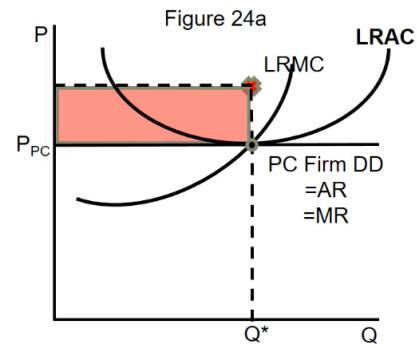


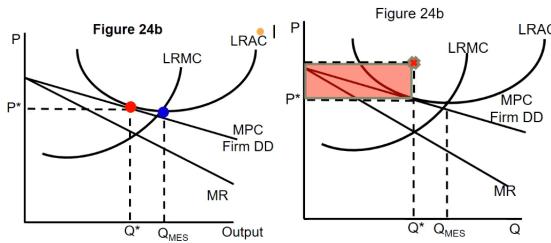
Figure 24c  
Price Setter – Monopoly or Oligopoly



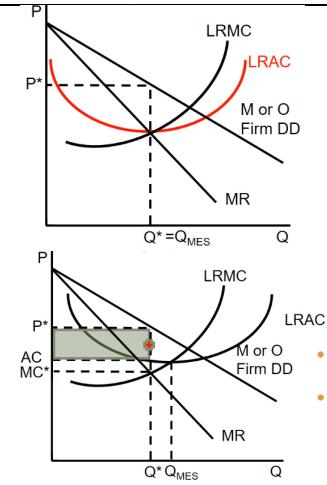
- PC – attained PE in LR equilibrium; why? operating at MES (lowest point on LRAC)
  - MES – scale of plant where LRAC has stopped falling; firm fully exploited all iEOS
  - Why? price taker, firm has to most cost-efficient to maximise  $\pi_s$ ; only LR normal  $\pi_s$  due to no BTE (0 economic profits), operate on LRAC curve
  - If operate at point above LRAC, X efficient, make losses/subnormal  $\pi_s$ , leave industry in LR



- MPC – productively efficient from own perspective; operate at point on LRAC due to LR normal  $\pi_s$ 
  - X efficient, operating point above LRAC, losses, face elimination from industry due to low BTE
  - Only way to maximise profits is to be as cost-efficient as possible



- Monopolies and oligopolies – can afford to be productively inefficient (firm/society's POV)
  - Operate at point above LRAC; but inefficiency results in wastage of resources
  - Ex. firm incur AC above C; why? can retain supernormal  $\pi_s$  in LR due to presence of complete/high barriers to entry; incur unit cost above its LRAC, makes less profits + X max profits but still survive and continue to exist in industry in LR as it makes at least normal  $\pi_s$



### Counterargument – globalisation + removal of protectionist barriers, growth in international competitions

- Impact: incumbent domestic monopoly face competition from big foreign conglomerates vying for share of lucrative domestic market
  - Compete in price cutting and non-price strategies (advertising & promotion to persuade consumers to buy their products)
  - Offer products highly differentiated from that of incumbent monopoly
- Result: affect sales of incumbent; to survive, incumbent has to reduce its inefficiency

### Society's POV

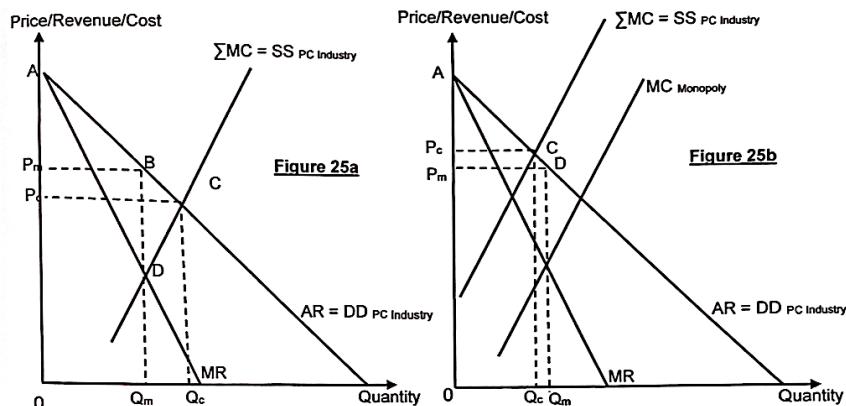
- PC – PE as produces at its minimum long run average cost (MES)
- Imperfect competition – not productively efficient (X producing at MES); falling portion of LRAC
- **MPC** – arises due to excess capacity theorem (trade-off between variety and PE)
  - Attempts at product differentiation (incur cost) result in firms producing at higher average cost → question: is there merit in product differentiation?
  - All profit-max MPC X PE from society's POV, at LR eqm,  $Q^* < Q_{MES}$ 
    - LR profit-max output level occurs at point where downward sloping AR curve is tangent to downward sloping portion of LRAC curve
    - Smaller scale production results in inability to reap all available iEOS
- **Monopoly & oligopolistic firms** – unlikely to produce at MES (unless by coincidence)
  - Output OQ – firm operating at falling portion of LRAC, X at MES, possible for iEOS to be exploited further, further fall in AC → firm X fully exploited all its iEOS
  - Can achieve PE by coincidence:  $\pi$ -maximising output level  $Q^*$  coincides with its MES  $Q_{MES}$

### Counterargument (for monopolies and oligopolies) – nature of industry argument

- Despite inefficiencies, each firm's  $Q$  sufficiently large to reap significant iEOS than if production carried out by many small firms  $\rightarrow$  possible for unit cost to be lower in monopoly/oligopoly than PC due to large scale production
- Draw same figure as that shown under counterargument section of allocative efficiency

	PC (fig 22a)	MPC (fig 22b & d)	O (22c)	M (22c)
AE	Yes	No	No	No
PE (society)	Yes	No	Typically no (coincidentally possible)	Typically no (coincidentally possible)
PE (firm)/ X-efficiency	All profit-max firms have to be x-efficient (PE from firm's POV)			
	Must be X-efficient to survive	Must be X-efficient to survive	Able to survive even if not X- efficient	Able to survive even if not X- efficient

**Equity** – greater equity under PC and MPC than under a monopoly or oligopoly



- Consumer surplus maximised at equilibrium price as  $P = MC$ 
  - PC – area  $P_cAC$
  - Monopoly – area  $P_mAB$ ; consumers suffer due to exploitative pricing (loss of CS area  $P_cP_mBC$ )
- PC – spread opportunities and wealth widely and more evenly
  - How? without barriers to entry, profits are spread amongst many small firms
- MPC – new firms easily enter and compete, only normal  $\pi$ s in LR, shared by many small firms
  - Spread opportunities and wealth across society; but loss of consumer surplus though extent is not as great as in a monopoly/oligopoly  $\rightarrow$  why? many rival firms selling close substitutes
- Monopoly – very high barriers to entry, able to earn and retain large supernormal profits
  - Exacerbate inequity in economy  $\rightarrow$  supernormal profits concentrated in the hands of a select few monopolies  $\rightarrow$  why? ability to block potential new entrants/few dominant producers at the expense of consumers; consumers pay higher prices for limited quantity of good
  - Anti-competitive behaviour (oligopoly & monopoly) [ex. collusion, price discrimination] further reduces consumer surplus

Counter-argument – consumer surplus X necessarily be reduced when monopoly enjoy substantial iEOS

- Cost savings of monopoly results in lower prices, consumer surplus increased by area  $P_mP_cCD$

### Dynamic efficiency (innovation)

- PC firm – X have ability/incentive to be DynE relative to MPC firm and oligopoly
  - Note – PC is a theoretical construct allowing us to compare and assess performance of real-world imperfect market conditions
- MPC firm – incentive to innovate but limited ability to do so
- Oligopoly – incentive and more ability to innovate
- Monopoly – ability to innovate but lack incentive to be dynamically efficient

Perfect competition – lack of dynamic efficiency, no incentive for R&D due to:

- Perfect information – innovations quickly replicated by competitor firm

- Discourages research and development, new firms X reap fruits of innovation
- LR normal profits – greatly limits PC firms' ability to undertake R&D which creates innovation
  - R&D expenditure often very high [ex. biomedical industry: purchase of expensive equipment + employment of research scientists needed to facilitate R&D]
- Homogeneous products – innovation to improving quality of product irrelevant

Firms in highly competitive markets – engage in innovation to improve quality of products, earn higher SR πs

- Real world – competition is the key driver of innovation (competitive oligopolies, MPC)
- MPC and oligopolistic firms have incentive to innovate, make products less substitutable
  - Why? demand less price elastic

**MPC firm** – less ability in spite of efforts at innovation; ability to fund R&D is a real issue

- Why? technology relatively easy to copy/replicate in some industries, low BTE and normal πs
  - Normal πs limits ability to innovate through huge investment in R&D (require significant capital outlay for research facilities)
- MPC firms engage in innovation emphasizing product differentiation, incur lower costs
  - Ex. minor changes to product, improving on packaging & design, improving quality of service/ambience

**Oligopoly** – encourage innovation, even more than in a monopoly; due to

- LR supernormal profits – due to high entry barriers and exit; ability to invest in R&D
- Existing competition amongst few dominant firms – invest in R&D to differentiate products
  - Serves to reduce fear of rivals' reaction to pricing strategies
- Significant BTE – oligopolies reap rewards of R&D, earn + retain supernormal profits in LR
  - Provides strong incentive for firms to engage in R&D
- Limitations – slow pace of innovation in collusive/entrenched oligopolies
  - Lack of competition from other dominant firms and potential entrants deter firms from undertaking R&D for reasons similar to those applicable to monopolies

Monopolies – LR supernormal profits due to complete BTE, ability to invest in expensive R&D projects

- Likely to do so when faced with a credible threat from a potential entrant
  - Supernormal πs attracts new entrants into industry producing new and competing products
- Joseph Schumpeter (concept of Creative Destruction) – entry barriers X serious problem in LR when level of technology changes; entry barriers are the very stimulus to creativity to destroy barriers
  - Monopoly profit (especially LR expansion of total output) is the most powerful engine of progress → PC is not only impossible but inferior and has X title to being set up as a model

Counter-argument – unlike competitive oligopoly, monopoly less willing/incentivised to innovate, but can

- Result – monopolies tend to reduce the pace of innovation; why?
- Very high BTE, dominant position of a monopoly is secured
  - Less need to innovate & improve quality of products (X hold in theory of contestable markets)
- Innovation erodes value of monopoly's existing products; favour status quo
  - Ex. Apple launch iPhone 5 decreases value of all previous models of iPhone series

**Consumer choice** – available in MPC and oligopoly market structure; limited in PC & monopoly

- PC markets – X offer consumer choices in terms of product variety; why? homogeneous goods
- Monopolies – consumer X choice to which variant of product to purchase; why? unique product
- MPC & imperfect oligopoly – consumers choose suppliers to purchase from, product differentiations

Consumer sovereignty in MPC vs Oligopoly – enhanced under MPC

- Why? MPC: consumers can choose from whom they want to buy products from
  - Product differentiation by competing firms, consumers value and enjoy increased choice on offer and greater variety of product
- Oligopolies – multiple branding (essentially similar products packaged under diff brand names)
  - More likely to engage in extensive advertising to maintain/enlarge market share than MPC → effect of limiting consumer choice to existing dominant firms in oligopoly market
  - Ex. cigarettes

Counter-argument – PC provide consumers with a choice of many producers vs monopolies

- Broader perspective – PC markets react to consumer demand responsively; changes in demand lead to changes in equilibrium price, resultant re-allocation of resources to meet consumers' wants → consumer sovereignty present
- Monopolies – consumers X have a choice wrt choice of producer; consumer sovereignty restricted, consumer surplus appropriated by monopolist

**Question – is perfect competition the most ideal (given that it achieves economic efficiency)?; limitations:**

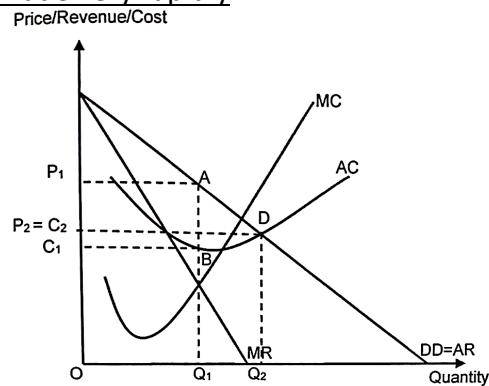
- PC is a static model
  - Lack of dynamic efficiency, very slow pace of innovation → innovation oftentimes key to progress of society as more and better products developed
- Problems of 3<sup>rd</sup> party costs & benefits (externalities), non-production of public goods by free market
  - Result: PC X deliver optimum allocation of resources
- Lack of LR supernormal profits; sources of funds for R&D result in product & process innovation
  - Large supernormal profits induces firms to produce at lowest possible average cost
- Homogeneous products, lack of variety of products
- Assumption of PC are restrictive; most unlikely to be found in the real world
  - X realistic representation of most markets, but ✓ understanding how markets work to achieve efficiency in resource allocation under an ideal situation → helps governments implement policies to improve efficiency of markets and increase society's welfare

### 7.3 THEORY OF CONTESTABLE MARKETS (ALTERNATIVE THEORY TO MARKET STRUCTURES)

- Real threat of competition is crucial in determining price and output (X size of firm relative to market)

→ **Contestable markets** – perfectly contestable markets are those when entry into and exit from the market by potential rivals is costless and when such entry and exit can be made very rapidly

- Supernormal profits, new firms enter, drive profits down to normal level → sheer threat ensures that incumbent firm (even monopolies) will:
  - 1. Price product closer to making normal profits at  $P_2$  than maximising profits at price  $P_1$ 
    - When  $AC = AR$  or  $P_2 = C_2$ , normal profits, return sufficient to keep FOP in present use
  - 2. Produce most efficiently, move towards producing at point on LRAC (PE from firm's POV)
- Failure to price competitively & be cost-efficient – potential into actual competition due to low BTE



Key conditions for a perfectly contestable market include

#### No exit costs (no sunk costs)

- X exist costs, reduce risks of entering market; increase potential entrants' ability to enter markets
- Firm encouraged to enter industry → why? if unsuccessful, transfer capital equipment elsewhere

Ex. rival coach company – opening up service on route previously operated by one company

- New firm X survive in market, use coaches purchased for different route/different purpose
- Cost of coaches X a sunk cost; capital equipment can be transferred to another market, relatively low/0 exit costs, new firm more willing to take risks of entry

Ex. power station – capital equipment X transferred to other uses

- Losing firm left with capital equipment X use, firm deterred from entering → market X perfectly contestable, established firm continue to make supernormal profits

**Perfect information** – ability &/ right of all suppliers to make use of best available production technology

**Low consumer loyalty** – reduces risks of entering market

→ **Hit and run competition** (hit and run tactics) – enter market for a short period when profits are high and then quickly withdraw

Ex. small delivery company

- Set up parcel delivery service, rival national postal service at X'mas, take advantage of increase DD
- Fear of competition, prevent national postal service provider from charging higher prices

### Evaluation – usefulness of theory

- Simple monopoly theory: only on existing industry structure; X account possibility of new entrants

Theory of contestability markets allows us to make the following predictions

- Firms behave competitively and price products competitively as long as the market is contestable
  - Disregards size and no. of firms in the industry; supernormal  $\pi$ s X be large
- Inefficient firms (including monopolies) X survive if market is contestable
  - Have to change their ways/leave industry in LR
- Theory suggests a new way to encourage firms to act like perfect competitors
  - Why? X direct interference in decisions made by firm, government efforts directed at making markets more contestable (lowering entry & exit costs)
  - How? granting more licenses to allow entry of new firms

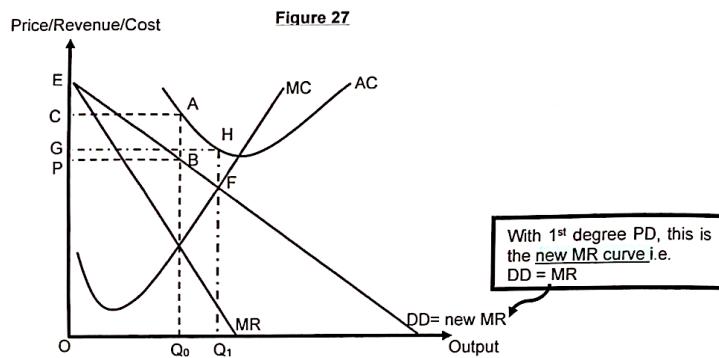
## 7.4 PRICE DISCRIMINATION AND PUBLIC INTEREST (POV of firms, employees, consumers, gov/society)

→ Benefits

### 1. First-degree price discrimination help price-setting firm survive in a recession

- Allocative efficiency achieved under 1<sup>st</sup>-degree p discrimination; Q higher than under uniform pricing → society better off (especially for goods deemed socially desirable – ex. museums)
- Ex. recession, demand falls below AC (AC higher than price consumers are willing and able to pay)
  - Uniform pricing for all goods sold – good X produced
  - First-degree p-discrimination – allows for production of such goods

Graphical representation



- W/o p-discrimination – profit-max equilibrium is OQ<sub>0</sub>; firms making loss of PCAB
  - $AC > P$  (AR) by PC; loss persists, firm X survive, minimise losses by leaving in market in LR
- 1<sup>st</sup> degree p-discrimination – total revenue is OEFQ<sub>1</sub> > revenue OPBQ<sub>0</sub> with no price discrimination
  - Why? consumer charged maximum price he is willing to pay for each additional unit of good (based on PED), price paid for additional unit differs
  - $MR =$  price of each unit (DD is now the new MR curve)
  - New profit-maximising level:  $MC =$  new MR, loss-making monopoly turned profitable

$$\text{New TR} = OEFQ_1 \quad | \quad \text{New TC} = OGHQ_1$$

### 2. Greater equity – price discrimination benefits consumers from lower income groups

- Lower-income consumers – relatively more price sensitive, more price elastic in demand, benefits from relatively lower prices charged under price-discrimination (V consume good/service they otherwise X afford)

Ex. legal services, law firms practice 3<sup>rd</sup> degree price discrimination

- Charge low-income consumers a lower price than high-income consumers for same legal service
- Why? legal fees larger proportion of income for low-income consumers than high-income ones

### Ex. drug companies justify using 3<sup>rd</sup> degree price discrimination

- Higher income countries: sell products at inflated prices; proportion spent on drugs lower
- Poorer countries: sell same drugs to patients at much lower prices
- Profits made in one market, firm cross-subsidise loss-making activities/services that have important social benefits

### **3. Higher profits may facilitate research and development**

- Price-discriminating producer able to extract consumer surplus and add to revenue, earn higher  $\pi$ s
- Higher  $\pi$ s re-invested into R&D, lead to product improvement & cost reduction, benefit society

### → Costs

#### **1. Less equitable** – producer surplus increases at the expense of consumer surplus

- Price discrimination, loss of consumer surplus, producers benefit at expense of consumers
- Ex. first-degree price discrimination, consumer surplus completely transferred to producer

#### **2. Unfair strategy to keep potential entrants out**

- Price-discriminating monopolist, use higher  $\pi$ s to set up strategic barriers, keep out potential entrants

## SECTION SUMMARY

- Under perfect competition, production will be at a point where  $P = MC$ 
  - Argued to be optimal; PC act as a spur to efficiency and bring benefits to consumers in terms of low costs and low prices
  - Perfectly competitive firms may be unwilling to invest in R&D/may have insufficient funds to do so
    - May produce a lack of variety of goods
  - PC firms may not necessarily lead to a fair distribution of income/guarantee an absence of harmful side-effects of production
- Monopolies
  - May be against public interest to extent they charge a higher price relative to cost than competitive firms; cause less desirable distribution of income; lack of competition removes incentive to be efficient and innovative; exert undesirable political pressures on governments
  - Economies of scale will in part be passed on to consumers in lower prices; high profits used for research & development and investment, in turn may lead to better products at possibly lower prices
- Monopolistically competitive firms – due to excess capacity may have higher costs than PC firms
  - Consumers gain from greater diversity of products
  - Fewer EOS than monopolies, conduct less R&D, competition keep prices lower than M
- Oligopoly behaviour – whether in public interests depends on:
  - Particular oligopoly + how competitive it is: whether firms engage in extensive advertising and of what type; whether product differentiation results in wide range of choice for consumers; how much of the profits are ploughed back into research & development; how contestable market is
  - Conditions vary substantially from oligopoly to oligopoly → not quite possible to simple state how well or how badly oligopoly in general serves the public interest
- Potential competition as important as actual competition in determining firm's price & output strategy
  - Threat of competition increases as entry and exit costs to and from the industry diminish
  - If entry and exit costs are zero, market is perfectly contestable; under such circumstance, an existing monopoly will be forced to keep its profits down to the normal level if it is to resist entry by new firms; exit costs will be lower, the lower are the sunk costs of the firm
- The theory of contestable markets can provide a more realistic analysis of firms' behaviour than theories based simply on the existing number of firms in the industry

# UNIT 8 – GLOBALISATION & THE INTERNATIONAL ECONOMY

## 1. INTRODUCTION

**Globalisation** is the growing economic inter-dependence of countries worldwide through increasing volume and variety of cross-border transactions in goods and services, inflows of capital, as well as labour migration

- Affected by ^: Industries, service sectors, levels of income & employment, living standards

## 2. INTERNATIONAL TRADE

**International trade** refers to the exchange of G&S between countries, involving the use of different currencies and crossing international borders

- Why it occurs? Δ taste & preferences, diff in DD though equally cost-efficient
- Benefits: obtain G&S X produced in sufficient quantities (lack resources/different FOP endowment)
  - Factor endowment: pop. density, labour skills, climate, raw materials, capital equipment

### **2.1 THEORY OF COMPARATIVE ADVANTAGE**

- **Absolute advantage** – one country more efficient/productive at producing every single good
- **Theory of comparative advantage** – states that countries would gain from specialisation and trade if there are differences in opportunity cost/relative efficiency of producing specific goods between countries. Countries benefit from specialising and exporting products in which they incur a lower opportunity cost/relatively more efficient in producing and importing a product which they incur a higher opportunity cost/relatively less efficient in producing.
- **Specialisation** – means that each country devotes all or a greater proportion of its resources to the good in which it is specialised in
- Gains include: 1. Improvement in global allocation of resources (global PE, greater output) which in turn lead to 2. Greater global consumption if terms of trade are mutually beneficial (consume outside of PPC)

#### Assumptions

- 2 countries, 2 goods
- Constant opp. costs when specialising & devoting ↑ resources to G production
- Only FOP: labour; homogeneous labour within country (equally productive), heterogeneous cross countries
- Perfect labour mobility within country, immobile between countries
- No transport costs and no trade restrictions

#### **Numerical illustration of theory of comparative advantage – Ricardian Model**

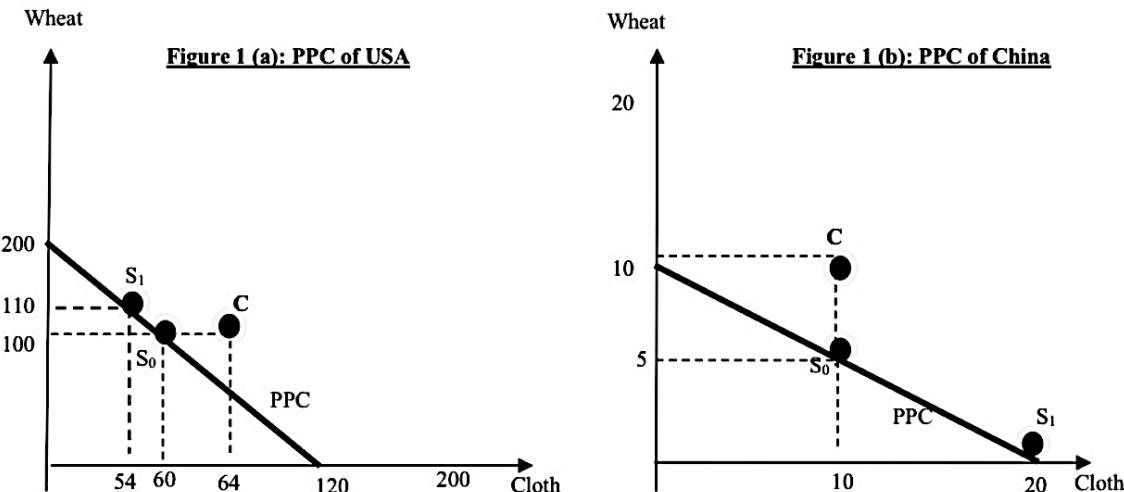
Before specialisation			Assume: USA absolute adv, produce ↑ with same labour resource <ul style="list-style-type: none"> <li>• Unit of labour resources from <u>country</u> produces either <u>quantity + wheat/cloth</u></li> <li>• Both countries have 2 units of labour resources, devote one unit to each good production</li> </ul>
	Wheat/unit labour	Cloth/unit labour	
USA	100	60	
China	5	10	
World Trade	105	70	
Opportunity cost of production			<ul style="list-style-type: none"> <li>• US produce 20x more W than China but only 6x more C</li> <li>• Meaning: US incur lower opp cost in producing W, higher opp cost in producing C; relatively more efficient in W production, possess CA in W production</li> <li>• Why? sacrifice of C production to produce 1 W unit lower in USA than in China</li> <li>• China comparative advantage in cloth production + repeat ^ explanation</li> <li>• USA specialise in producing W; China in C</li> </ul>
	Wheat	Cloth	
USA	0.6 units of C	1.67 units of W	
China	2 units of C	0.5 units of W	
Production pattern with specialisation			<ul style="list-style-type: none"> <li>• Assume USA partial specialisation: transfer 1/10 labour resource to W production</li> <li>• China complete specialisation in C production</li> <li>• World production of W &amp; C ↑ by ___ &amp; ___</li> </ul> <p>Result: countries produce good incurring ↓ opp cost of production, improve global allocation of resources, ↑ global productive efficiency, ↑ global output, ↑ global C.</p>
	Wheat	Cloth	
USA	110	54	
China	0	20	
World Trade	110	74	

Consumption after specialisation & trade			Exchange ratio/terms of trade: beneficial if opportunity costs of production lie between that of the 2 countries
	Wheat	Cloth	<ul style="list-style-type: none"> <li>• USA: export 1 unit of W for &gt; 0.6 units of C</li> <li>• China: import 1 unit of W for &lt; 2 units of C</li> </ul>
USA	100	64	Result: rate of exchange is 1 unit of W = 1 unit of C
China	10	10	<ul style="list-style-type: none"> <li>• USA gains 4 units C, China gains 5 units W</li> <li>• ↑ total output consumed, each consume more and beyond what each country produces (PPC), ↑ mSOL</li> </ul>
World Trade	110	74	

**Terms of trade** refer to the rate at which a country exchanges its exports for imports |  $TOT = P_x/P_m$

- Determine distribution of gains from trade between countries, affect BOT & SOL
- International trade is beneficial + ↑ consumption of G&S only if: TOT are acceptable
  - Specialise in G w comparative advantage + TOT lie between two countries domestic opp cost

**Diagrammatic illustration of theory of comparative advantage** [use straight-line PPC for simplicity]



- USA comparative adv in W production; China comparative adv in C production
  - Assume USA/China devote all resources to either W or C
  - USA: 2 units of labour, max 200 units of W or max 120 units of C
  - China: 2 units of labour, max 10 units of W or max 20 units of C
- Before specialisation & trade: assume both countries devote 1 unit of labour each to W and C
  - Assume international trade does not take place, USA produces and consumes \_\_\_, China \_\_\_
  - USA produce 100 W & 60 C | China produce 5 W and 20 C → consumption bounded by PPC
- With specialisation: each country specialises in producing good they incur ↓ opp cost in producing
  - USA lower opp cost in W, specialise partially in W (1/10 prev to C to W), produce at  $S_1$ 
    - USA gives up 0.6 C to produce 1W, China gives up 2 C to produce 1 W
    - Why? USA more efficient in producing W & C, but relatively ↑ efficient in W
  - China lower opp cost in C, completely specialise in C production produce at  $S_1$ 
    - China gives up 0.5 W to produce 1 C, USA gives up 5/3 W to produce 1 C
    - World production of cloth and wheat increases, improved global efficiency
- With trade: production constrained by PPC, consumption beyond PPC, ↑ material SOL
  - TOT mutually beneficial: exchange ratio lies between opp cost of producing good
  - Assume terms of trade is 1:1 (1 W = 1 C), both countries better off, ↑ C, ↑ mSOL
  - US: exports 10 W for 10 C → consume 100 W and 64 C
  - China: exports 10 W for 10 C → consumer 10 W and 10 C

## 2.2 SOURCES OF COMPARATIVE ADVANTAGE

- **International differences in factor endowments** (why? international mobility of resources restricted)
- Climate & resource endowments (skilled/unskilled labour, capital stock, QQ of arable land) differs
  - Importance: determine productive potential of economy, relative productivity of G, CA
  - Result: differences in relative p of FOP, affect relative p of G&S → countries specialise in G&S w FOP in abundant supply & produce ↑ efficiently, obtain G&S X produce/ ↓ efficient in producing
    - Ex. America w abundant capital, skilled labour & arable land – net exporter of skilled, labour-intensive, technologically intensive products (chemicals, aircraft, precision instruments); net exporter of temperate-zone agricultural products (wheat, corn, soybeans); net importer of less-skilled, labour-intensive products (clothing, shoes)
    - Ex. SG w land and labour scarcity – produce G w relatively less labour and land intensive; exports machinery and equipment (disk drives, integrated circuits, computer parts); imports all raw materials/rice requirements
    - Ex. Africa: diamonds, Middle East: oil (OPEC), China: human capital
  - Caveat: Δ endowments over time; why? e.g. ↑ savings, ↑ capital accumulation/ ↑ years of educational opportunities, ↑ skills level of labour

→ **Differences in technology**

- Diff stages of devt, diff intensities of R&D, diff speeds of absorption of new tech → diff labour prod.
- Importance: internationally tradeable + X basis for CA; ✓ keep ahead in tech. race to give CA

→ **Dynamic comparative advantage** – changing pattern in comparative advantage

- David Ricardo's CA theory: CA is static | reality: FOP avail by creating/importing → gain CA over t
- Factor endowments depleted over several decades esp non-renewable resources (coal, petroleum, natural gas) → CA lost over time
  - Ex. M'sia CA in tin production (55% world production; world leading tin exporter 19<sup>th</sup> century), large scale manufacturing led to depletion of tin deposits, ↑ costs of harvesting tin, ↑ opp cost of tin production, less price competitive in world market, fall to 30% world production by 1992 → CA changes with changes in factor endowments
- Changes in population/development in the country
  - DCs: ↑ average Y, Δ preferences (choice to not have children), erode cost advantages in labour intensive industries, labour SS shift left, ↑ wages, ↑ COP
  - Ex. China: world's manufacturing hub due to low labour cost, ec. grow, ↑ labour cost (1 child policy) → other countries w low labour cost (Vietnam) absorb manufacturing investments that X see China as cost efficient to invest in → link: Δ CA w Δ population
- Gov establish industrial policies: promote opp for Δ CA over time
  - Interventionist SSP: subsidies for edu/compulsory edu → acquisition of industry relevant skillsets/ability to use machinery/capital efficiently, ↑ labour productivity, ↓ COP, ↑ productive capacity → cost advantages in skills/knowledge intensive sectors → link to CA
  - Fiscal P: ↓ corporate tax rates, incentivise investments by local & foreign firms as expected rate of return increases since cost falls from gov. intervention, ↑ stock of capital goods → CA in capital intensive industries
  - Ex. SG gov generous tax incentives & funding for infrastructure for biomedical facilities to attract foreign firms to locate production facilities in SG (negotiating vaccine warehouses with WHO, exploring in-house drug production facilities with companies like Pfizer)
  - Ex. Japanese CA created through mobilising skilled labour, tech & capital → J gov promote opportunities for change through time
  - Ex. SG gov diversify economy in new areas w potential CA arising; why? reduce reliance on traditional industries due to intense global competition → global hub for clean energy (solar, wind, smart grids), pharmaceuticals & biotechnology, digital media, medical technology

Refer to notion T3W5C1 for more sources (ec. devt; competition from other countries)

### 2.3 LIMITATIONS OF THEORY OF COMPARATIVE ADVANTAGE – relate to CA assumptions

- CA assumption X fulfilled: gains from specialisation & trade reduced/eliminated, X maximised

→ **High transport costs** – costs of moving goods (freight charges, packing, handling, insurance premiums)

- Add significant margin to price of traded commodity, ↓ gains from S&T from diff in opp cost
- Ex. A produce bricks more cheaply but weight too expensive to export, transport costs limit S&T

→ **FOPs immobile within country** – CA: labour move freely within country in specialised industry w CA

- Reality: X reallocate labour quickly & efficiently between industries to expand industries w CA + contract those w comparative disadvantage → difficult to realise + maximise benefits from S&T

→ **Increasing opportunity costs** – increasingly specialises in G, use resources less & less suited, ✓ other Gs

- ↑ specialised country, ↑ opp. costs, reduce/disappearance of comparative cost advantage, X S&T
- Explains why specialisation is X complete (stop at point where domestic opp cost exceeds TOT)

→ **Trade and currency restrictions (protectionism)** Gains from S&T based on CA contingent on free trade

- Protectionist measures (tariffs, quotas, exchange controls) hinder world trade, ↓ gains from S&T

### SECTION SUMMARY

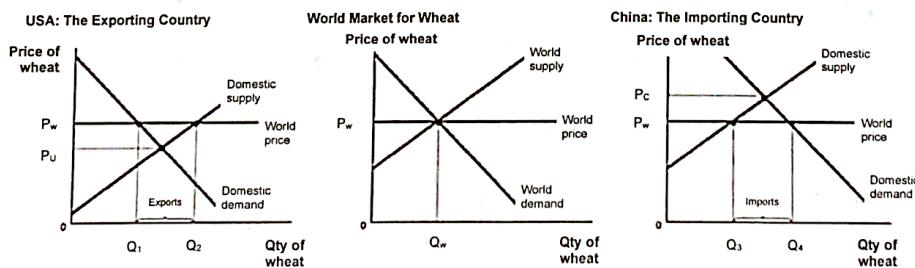
- A country has comparative advantage over another country in producing a good when the opportunity cost of producing that good is lower. This also implies that the country has a comparative disadvantage in the production of the alternative good
- Specialisation is based on the relative opportunity costs between countries. When opportunity costs are the same across all countries, there is no comparative advantage and thus no possibility of gains from trade
- When opportunity costs are the differ, it is always possible to improve global efficiency and increase world total production by a suitable re-allocation of resources within each country
- The existence of artificial or natural barriers to free trade will lower the gains from trade that arises from comparative advantage
- The theory of comparative advantage considers only the differences in factor endowments between countries. It is a supply side theory to why countries trade

## 3. PATTERNS OF TRADE

- Commodity composition of trade: types of G&S exported and imported; inter & intra industry trade
- Geographical composition of trade: trade direction (importing/exporting), trading partners identity

**3.1 DEMAND AND SUPPLY ANALYSIS** – theory of CA: only comparative cost diff (diff in factor endowments), X diff level of DD affect trade patterns (simple DD & SS analysis)

Figure 2: Demand and Supply Analysis



- No international trade – domestic equilibrium price, national QD = national QS (domestic DD = SS)
  - US pre-trade price  $P_u$  lower than China  $P_c$  (DD relatively higher)
- With free trade & X currency restrictions – China import wheat, US export wheat
  - US attracted by higher prices in China  $P_c$ , additional DD for X, increases market price by US
  - China cheaper to import from USA, additional SS into China by M, reduces market price
- After trade, world price  $P_w$ , imported  $Q_3Q_4$  = exported  $Q_1Q_2$  (consistent with gains from trade)

**3.2 INTER-INDUSTRY TRADE** refers to trade between countries where exports and imports consist of different types of goods across different industries

### Main determinants of inter-industry trade

#### A Theory of CA: Differences in sources of comparative advantage (influences country's pattern of trade)

- Export G&S incurring lower opp cost; import G&S otherwise produced at higher opp cost
- Ex. SG – strategic location: nature; CA in transportation & maritime trade services (re-export etc.)
  - Re-exports (exclude oil X): 50% total X; electronic (PC parts, telecommunications equipment) & non-electronic re-exports (jewellery, precious stones, pearls)
- Ex. SG – ↑ skilled labour resources (vs China, Malaysia), ↓ opp cost in high-value-added production (chemical processing, manufacturing of electronic components, microchips), imports land & labour intensive goods (wooden products, textile, food) with relatively more abundant land and labour

#### B Demand factors such as population and income levels

- ↑ affluence trading partners, Δ taste & preferences, pop size, demographics, affect pattern of trade
- Ex. developing ec (China/Vietnam) import capital equipment; ↑ Y, ↑ M SG G&S, ↑ DD & gains of trade

#### C Limitations to theory of CA (eg. transport costs, artificial barriers to trade)

- Geography & transport costs explain larger volume of trade (SG w M'sia/Indo vs Alaska water)
- Artificial barriers to trade [ex. US embargo on Russian G to condemn Russian-Ukraine war; US-China trade war increase cost of trade/exports, lower level of trade of G&S]

**3.3 INTRA-INDUSTRY TRADE** refers to the simultaneous import and export of product within the same industry and can involve trade in differentiated products (horizontal specialisation) or trade in intermediate goods (vertical specialisation)

### Factors affecting pattern of intra-industry trade

#### A Demand-side factors (eg. taste and preferences lead to trade even in countries w CA)

- Consumers value differentiated products & variety, willing to pay different prices for diff. products
- Ex. SG M pharmaceuticals/personal computers from USA/Europe for consumers' differing T&P; SG produces heart stents w CA, some prefer branded US/French pharmaceutical giant stents

#### B Economies of scale from intra-industry specialisation – countries w similar factor endowments

- Horizontal intra-industry trade to exploit more fully available iEOS by specialising in niche products
  - Benefits: lower LR average production costs, provide competition & variety for consumers
  - Relevant for small countries w small domestic mkt X support large-scale indust. & reap iEOS
- Ex. continental car manufacturers (Mercedes, BMW in Germany) specialise in luxury cars; Asian: cost-efficient methods → wider choice of models, diff taste & pref/Y levels within country catered to

**3.4 SINGAPORE'S PATTERN OF TRADE** – small open economy

- Total trade (= X + M) ~300% of GDP → dependent on exports for growth (why? small domestic mkt)
- Lack of natural resources → heavily dependent on imported raw materials
- Low proportion of world DD, X influence world prices of X & M → SG is price-taker
- ↑ in overlap in G composition traded/intra-industry trade → ↑ bilateral trade linkages

A Summary of Singapore's Pattern of Trade with the Rest of the World

Major Trading Partners	
Top Trading Partners	Malaysia, United States, China, Indonesia, Japan, Thailand, South Korea, Hong Kong, EU
Other Trading Partners	Australia, India, Vietnam, Myanmar, Latin America, Eastern Europe

Major Industries/Exports/Imports

Major Industries	Electronics, pharmaceuticals, chemicals, banking and finance, tourism, refined petroleum products
Major Exports	Machinery and transport equipment, petrochemical products, pharmaceutical products, miscellaneous manufactured products such as integrated circuits, petroleum-refined products, financial and business services
Major Imports	Electrical machinery, mineral fuels including oil, machinery including computers, precious metals, vehicles, food items

Source: <http://singstat.gov.sg>

**3.5 CONCLUSION – trade pattern is not static but dynamic; world prices determined by global SS & DD**

- Δ pattern of trade due to – Δ sources of CA, taste & pref, gov policies
  - Δ Factor endowments, technology (due to ↑ savings, capital accumulation), ↑ skill level of labour force (↑ education), advancement in tech (investment in R&D)
- Quantity & quality of factor endowment & tech determine productive potential of ec, relative productivity in each good, and thus CA of country *hello jeanee :DDDDDD <3 :DDDDDD jeanee econs*

## SECTION SUMMARY

- A country's pattern of trade with other countries can be observed from the composition & direction of trade
- Countries can engage in inter-industry trade and intra-industry trade
- The trade pattern between countries can be explained by a variety of factors including differences in labour productivity and factor endowments between countries, demand factors, transport costs and so on
- The trade pattern between a country and the rest of the world is not static but changes over time

## 4. EFFECTS OF INTERNATIONAL TRADE

### 4.1 BENEFITS OF INTERNATIONAL TRADE ON THE NATIONAL ECONOMY

#### Microeconomic benefits

##### A Increase consumer welfare

1. Higher consumption possibilities – theory of CA: gains from S&T, ↑ global efficiency, ↑ world prod. & C
  - Individual countries consume beyond PPC, enjoy ↑ material welfare, ↑ CS (X restricted by PPC) reflected by lower prices & higher consumption levels (import substitution markets)
2. Greater variety and higher quality of goods and services – expand market for G&S exports avail to us
  - ↑ consumer choice, ↑ consumer sovereignty (Japan/German/USA cars, strawberries X SG produced)

##### B Increase in firms' profits

1. Expands demand for firms – ↑ consumer base, ↑ total revenue & market share
  - ✓ tap into markets expanding quickly from strong economic growth, fuelling rise in DD ( $YED > 0$ )
2. Lowers costs by exploiting available economies of scale – incentive to S&T even w/o diff in opp cost/tech
  - iEOS: ↑ scale of prod., iEOS, lower LR unit COP, ↑ πs, ↑ R&D, improve pdts quality & future πs
    - Small domestic market (SG/Israel): XiEOS, prohibitively expensive to be self-sufficient → w S&T: produce limited range of commodities on larger scale to reap avail cost savings & export to widen markets, iEOS realised
  - eEOS: ↑ industry size, ↓ cost per unit of output (int. trade encourage devt of key industrial hubs)
    - Concentrating production in few locations ↓ costs even if indiv firms remain small
    - Ex. USA semiconductor industry in Californian Silicon Valley, investment banking in New York, entertainment industry in Hollywood → eEOS played key role in their development
  - Learning by doing: ↑ time product in existence, ↑ production performance, ↓ costs
    - How? int. trade, specialise in production of G for X, gain experience in particular tasks, workers/managers ↑ efficient, ↓ unit COP (esp knowledge-intensive/high-tech industries)

##### C Improves society's welfare

1. Exposure to foreign competition – prevents complacency, ↓ barriers to entry, incumbents will
  - Market power checked (↓ mark-ups, ✓AE), ↑ efficient methods of production (↓ X-inefficiency)
  - ↑ incentivised to R&D, DynE (↑ product quality: product innovation, ↓ cost: process innovation)
2. Trade creation
  - Import substitution industries: consumers enjoy ↑ CS, ↑ overall society's welfare
  - Export-orientated industries: producers enjoy ↑ PS, ↑ overall society's welfare

#### Macroeconomic benefits – think import and export effect; 4 macroeconomic goals

##### D Stimulate economic growth, increase employment, improve BOT

1. Enlarging the market – impt for small open ec.s w small domestic market, important stimulus for ec. gr.
  - Produce for wider int. mkts, ↑ X volume **AND** conducive environment for domestic I & FDI → ↑ AD (X & I), ↑ employment levels, ↑ RNY via multiplier effect → **actual growth**, ↑ SOL, ↑ BOT
2. Facilitate transfer of tech & ideas (potential growth) – int. trade → Xchange of ideas & techniques
  - Help LDCs leapfrog stages in economic development, avoid mistakes by DCs (SG 1965)
3. Dynamic gains from trade – refer to the effect of trade on acceleration of a country's growth rate and thus on the volume of additional resources made available to trading country over time; ↑ productive
  - ↑ output and Y over time, ↑ savings & I in equipment/manufacturing plants, ↑ rates of ec gr.
  - Open economy to trade, ↑ imported capital equipment, ↑ productivity levels → potential growth

- Result – gains from international trade, economy grows faster than closed economies
- Ex. LDCs obtain necessary resources for production through imports of capital goods (machinery, transport equipment, vehicles, power generation equipment, road building machinery) & raw materials → produce ↑ quality G&S, ↑ efficiently, accelerate ec. gr.

#### **E Lower inflationary pressures**

- ↑ avail relatively cheaper M FOPs, ↓ COP, ↑ AS, dampen cost-push inflation
- Cheaper imported final G&S, ↓ consumer price index
- Foreign competition prevents complacency, difficult to merge/gain monopoly control in open ec. → ↓ prices, ↑ material SOL & consumer surplus

## **4.2 COSTS OF INTERNATIONAL TRADE**

### **Microeconomic costs**

#### **A Widening income disparities** – S&T lead to rapid growth in countries involved

- Shift in mix of goods produced, ↓ DD some FOP, ↑ DD for G in export-oriented industries → ↑ Y disparity, gov need to actively redistribute income to prevent social tensions within economy

#### **B Unfair competition and dumping** (refers to selling goods in overseas markets below MC of production)

- Objective: drive out rival producers in importing country, monopolise market, ↑ prices in LR
- Result: import-substituting industries in receiving mkt X compete, X develop, unfair competition if production subsidised by producers in importing country → **allocative inefficiency**, ↑ prices in LR

### **Macroeconomic costs**

#### **C Over-dependence on other countries (over reliant as export markets)** – susceptibility to external shocks

- Trade & financial spill overs, ec. crisis transmitted, externally-induced cyclical UnE → worsen BOT
  - Solution to avoiding over-reliance: diversify exports & trading partners
- Susceptible to import-push inflation; why? source country facing inflationary pressures
  - Basic, strategic, essential goods → X fully depend on foreign suppliers for such goods

#### **D Increased risk of structural unemployment**

- Why 1? S&T, narrow industrial/economic structure, composition of G&S produced/job types limited → Δmarket conditions (↓ DD/exhaustion of non-renewable resources), serious ec. decline AND structural rigidity, difficulty recovering from ec. crisis
- Why 2? Δ market conditions/free trade, structural decline of import-substituting industries X compete/adapt in ΔDD/↑ efficient competitors, ↑ structural UnE (labour redundant in sunset industries, X find employment opportunities in sunrise industries due to skills mismatch)

## **SECTION SUMMARY**

- Specialisation and trade can lead to greater global productive efficiency and in turn greater production of world output. Trading partners can thus experience higher consumption levels that were previously unattainable.
- Free trade can allow economies, particularly small ones, to realise internal economies of scale, giving them cost advantages. Large economies also benefit from broadened markets (expanded consumer market).
- Micro and macroeconomic benefits of free trade include lowered prices and lowered inflationary pressures, increased choice, economic growth and improved balance of payments.
- The main disadvantages of trade are increased exposure to external shocks, as well as structural unemployment issues and widening income disparity.
- Governments need to put policies in place to tackle these disadvantages so that trade can have its trickle-down benefits for the whole economy.

## 5. PROTECTIONISM

**Protectionism** is a policy of sheltering domestic industries from foreign competition through the imposition of trade barriers on imports; export-oriented countries (ex. China/SG hardest hit by protectionism)

### 5.1 METHODS OF PROTECTIONISM

**Tariffs** are custom duties or taxes imposed on imports of goods or services by the government

- Specific tariff – fixed amount of money per unit of import
- Ad valorem tariff – tax levied as fixed percentage of the import price
- Objective: ↑ domestic production (↓ structural UnE in M-sub industries), ↑ gov. revenue

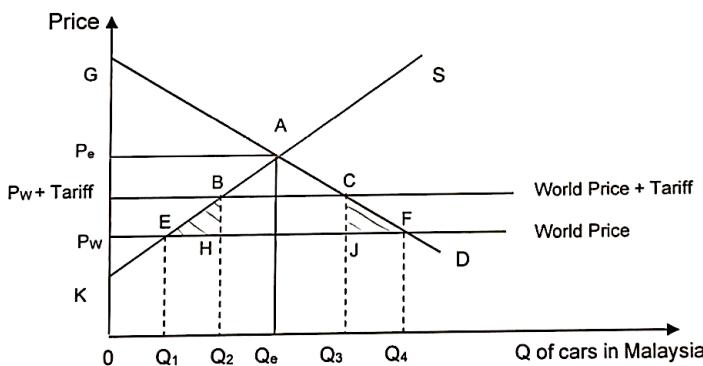


Figure 3: The effects of a specific tariff on the market for cars

#### Assumptions

- Foreign car producers have CA in car production, willing to supply all cars DD by Malaysia at  $P_w$  (SS curve of M cars is perfectly p elastic)
- M'sia is small importing country, price-taker in global car market, M'sia purchase of M X influence world price  $P_w$

#### Graphical analysis

- w/o international trade: domestic price  $OP_e$ , output  $OQ_e$
- Under free trade: domestic price = world price  $P_w$  (M'sia is price-taker)
  - Domestic production is  $OQ_1$ , domestic consumption  $OQ_4$ ,  $M = O_1O_4$ ,  $M$  expenditure =  $O_1EFQ_4$ , consumer surplus  $GFP_w$ , total domestic producer surplus  $P_wEK$
- After specific tariff (\$t/unit): SS shifts up by amount of tariff (added to price of every unit of M sold)
  - Domestic price rises from  $OP_w$  to  $OP_w + \text{tariff}$

#### Economic effect of tariffs on the national economy

- Obj 1: reduce imports, increase domestic production: ↑ domestic production from  $OQ_1$  to  $OQ_2$ 
  - ↑ TR from  $OP_wEQ_1$  to  $OP_{w+\text{tariff}}BQ_2$  (why? ↑ domestic production & ↑ p)
  - ↑ domestic producer surplus by  $P_wEBP_{w+\text{tariff}}$
  - Caveat – extent of ↑ PS depends on PES (↑ PES, ↑ increase in QS of domestic cars)
- Obj 2: increase government revenue: ↓  $M$  from  $Q_1Q_4$  to  $Q_2Q_3$ 
  - Foreign producers receive  $OP_w$  per unit sold, gov receives tax revenue from extra paid BHJC
- Disadv 1: consumption effect: tariffs force consumers to
  - ↓ total consumption from  $OQ_4$  to  $OQ_3$  AND ↓ QD from  $Q_4Q_1$  to  $Q_3Q_2$  & switch to relatively less efficient domestically produced substitutes
  - ↓ CS by  $P_wFCP_{w+\text{tariff}}$  (pay more but consume less)
  - Caveat – extent ↓ CS depends on PED (↑ PED, ↑ fall in QD for cars when tariff imposed)
- Disadv 2: deadweight/efficiency loss to society: area EBH and JFC (why? tariffs distort incentives)
  - Area EBH – production distortion loss; resources diverted from relatively more cost-efficient foreign producers to relatively less cost-efficient domestic producers
  - Area JFC – consumption distortion loss; loss in benefits from not consuming  $Q_3Q_4$  greater than gain in resources saved
- Note: **concept of elasticity (PED/PES):** ↑ PED<sub>M</sub> by domestic consumers, ↑ fall in M expenditure

#### Summary of effects

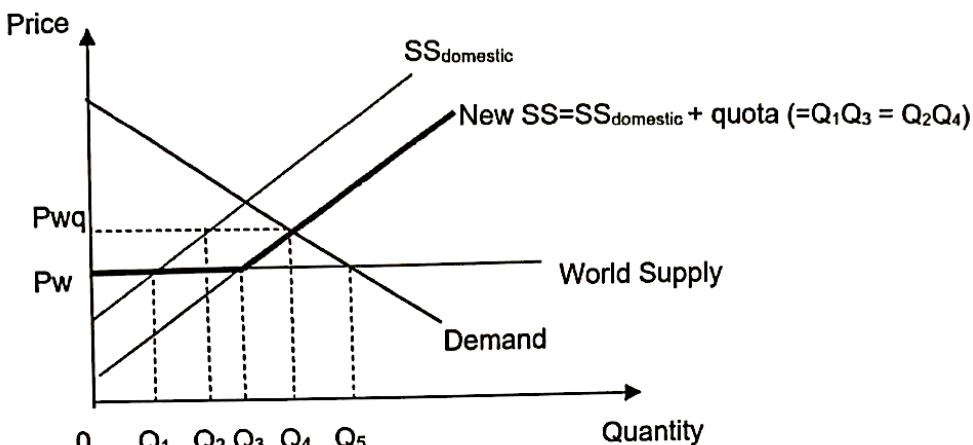
	Effect	Area on diagram
Domestic producers	Gain in producer surplus	+ Area ( $P_wEBP_{w+\text{tariff}}$ )
Foreign producers	Loss in revenue	- Area ( $EHQ_1Q_2 + JFCQ_4Q_3$ )
Domestic consumers	Loss in consumer surplus	- Area ( $P_wFCP_{w+\text{tariff}}$ )
Government	Gain in tax revenue	+ Area ( BHJC )
Society	Deadweight loss	- Area ( EBH ) and ( JFC )

## Unintended consequences

- Cost-push inflation:  $\uparrow p$  of essential FOP (eg. steel in car manufacturing industries)
- Retaliation with similar measures (import tariffs) by trading partners: worse outcome than before

## Non-tariff barriers

### A Quotas



- Import quota – direct restriction on the quantity of some good that may be imported
- Result:  $\uparrow$  consume of dom. cheese,  $\uparrow$  domestic production, domestic firms gain  $\uparrow$  total revenue
- Adv:  $\uparrow$  certainty of protection for local producers
- Disadv: displace p. mech. in determining Q of M, X consumer sovereignty (X decide QQ consume) **AND**  $\uparrow$  domestic p. of M goods,  $\downarrow$  consumer welfare **AND** X gov. revenue (unless sell right to M)
- Eg. US quota on imported foreign cheese: only certain firms allowed, each allocated right to import max amount of cheese each year

### B Subsidies

- Export subsidies are cash grants by gov to domestic X producers to incentivise to sell  $\uparrow$  G overseas
  - Aim: promote export industries crucial for ec/reduce BOT deficit
- Domestic production subsidies are payments per unit of output granted by the government to domestic firms that compete with imports
  - Result:  $\uparrow$  output level (dom. firms for X/dom C),  $\downarrow$  quantity of imports in country
  - Disadv: opp cost incurred (directed elsewhere)
  - Eg. merit good production (education/goods with positive production externalities like R&D)

### C Foreign exchange controls

- How? Int trade carried out in foreign currencies, Central Bank control purchase & sale of foreign currencies, limit quantities + types of imports & exports traded
- Implementation: 1. Limit on amount of foreign currencies made avail to importers (financial quotas) 2. Charges made on people purchasing foreign currencies

### D Embargos – complete ban on certain imports or exports, from or to certain countries

- Why? social (demerit goods), political reasons
- Eg. Russia-Ukraine War: international pressure to condemn Russia; UK & EU ban luxury goods X to Russia (vehicles, high-end fashion, art); US: all Russian oil & gas imports

### E New protectionist measures – subtler and less obvious forms of trade barriers (disguised restrictions)

- Implement technical specifications & standards discriminate in favour of home producers
  - Safety/hygiene regulations on food & pharmaceutical products
- Preferential treatment for domestic firms when awarding public sector contracts
  - Result: limits foreign firms' ability to compete on level playing field for G&S exports
- Administrative regulations regarding import procedures: bureaucratic, delays &  $\downarrow$  vol of M
- Voluntary export restraints (VER) OR voluntary restraints agreements (VRA)
  - X country persuaded by M country to voluntarily  $\downarrow$  X; threats of all-round trade restrictions
  - Eg. VERs negotiated by US on textile, automobile, cars, shoes when threatened by more efficient, lower cost M from Japan

## 5.2 BENEFITS AND COSTS OF PROTECTIONISM

- Theory of CA: S&T achieve greatest amount of production & consumption through AE global scale
- Protection: worsens global & domestic resource allocation
- KIV: free trade creates winners & losers; protectionism redistributes gains from winners to loser

### A Protect infant/newly established industries

- Heavy initial costs incurred X completely covered by initial small output **AND** time to develop skilled management, reputation, exploit efficient technologies & reap advantages of large-scale production
- Aim: iEOS/learning by doing, ↓ LRAC of production, price goods ↑ competitively in dom/for. Mkts
- Importance: industries w potential comparative advantage, guaranteed home mkt help get over teething problems + compete on more equal footing; w/o p, potential efficient source of SS cut off
- Eg. industrial giants resort to protectionism against competition to rapidly industrialise economies (NIEs – HK, SG, Taiwan) | SG: protective duties covering 300 items in early 1960s, discouraged since 1970s → very few import items taxed/subjected to quotas

#### Counterargument

- Difficult to identify with certainty industries presently unprofitable acquiring CA in LR
  - Gov incorrectly choose industries w/o potential CA
- Difficult to decide when industry is fully & sufficiently established to do w/o protection
  - Perpetual infants: inefficient due to complacency, continual protection for survival
- LT protection, X incentive to mature into strong & efficient producers to compete internationally
  - Infant industry remain X productive/innovative (better quality G/ ↑ cost effectively) → failure to compete internationally over LT → unemployment over time

### B To protect sunset/mature industries and reduce structural unemployment

- Traditional industries lose CA: unprotected/close down, massive regional structural UnE (highly localised) → protectionism: slow industry decline, time to switch resources to other ec. activities
  - Why lose CA? Technological progress (British textile vs man-made fibres)/emergence of new competitors exploiting latest technology (UK shipbuilding vs Japan shipbuilding)

#### Counterargument

- X increase total employment over long term (protectionism prevent ST massive UnE)
  - Why? Perpetuate domestic inE, prolong inefficient use of ec. resources, X AE → resources ✓ channel to develop potential industries contributing ↑ ec. growth, high opp cost
- Lack of willingness to restructure when country loses CA over time
  - Developed country ✓ re-look industries; shut down & divert resources to ↑ productive use
- Retraining takes time – trade protection justified as ST measure while retraining occurs
  - Prevent structural UnE: retrain displaced labour, effectively rechannel to other industries

### C To improve economic performance

- Reduce balance of trade BOT deficits (occur when M expenditure exceeds X revenue received)
  - Eg. ex-US President Donald Trump cited US trade deficit w China/Mexico as US losing in trade

#### Counterargument

- Best as a ST measure to improve BOT deficit; ✓ look at root causes of BOT deficit in LR
  - Eg. exports uncompetitive (high inflation), ✓ to raise productive capacity of ec. through SSP
- Invite retaliation from trading partners, reduction of exports, negating original improvement in CA
- Increase national income and employment in times of recession/economic stagnation
  - Why? Protectionism is emergency SR measure during recession: avoid heavy retrenchments & UnE → M expenditure create employment in foreign countries → impose tariffs & quota create jobs, ↑ prices of M, divert C to domestically produced G
  - Eg. 2009 global financial crisis, advanced western countries US use protectionist policies (↑ tariff & M quota) to support economy by sheltering them from foreign competition

#### Counterargument

- Worsens economic problems of other countries (beggar the neighbour – Great Depression)

- Partners experience ↓ export sales, ↓ employment, trigger retaliatory measures → original ↑ domestic production offset by fall in X revenue
- Structural unemployment: generate jobs that workers X have the skills to fill up (refer to notion)
- Obj: ↑ employment, demand-management policies/cost-cutting measures on SS side better

#### D To protect against unfair trade practices (dumping)

- **Dumping** refers to sale of goods in an overseas market below the marginal cost of production, which is often made possible with government subsidies
- Result: domestic X compete w foreign exporters, ↓ domestic output & employment, drive out rival producers in importing country, exporter monopolise market in LR, ↑ p aft home industry collapse
- Eg. US Commerce Dept decided Chinese manufacturers were unfairly undercutting US solar manufacturers (massive loans from China's state banks), US imposed tariffs on China solar panels 2012

#### Counterargument

- Protection justified if dumping → market distortions → LT damage for domestic economy
- Caveat: level of protection ✓ only cover diff btwn X price & dom. p paid by consumers in X country
  - Foreign producers sell ↓ price in int mkt than in home market due to diff. in DD conditions, M country's consumers benefit in LT from lower prices → protectionism X justified

#### E To diversify economy – undesirable consequences of narrow specialisation & over-reliance on others

- Why 1? Limited composition of G&S, types of jobs available limited **AND** specialised industries vulnerable to economic upheaval (Δtaste & tech) → structural rigidity, economic decline, massive UnE → greater diversity & self-sufficiency reduce risk
- Why 2? Too dependent on industries to earn foreign exchange to obtain foreign supplies + for ec. growth → run risk of X able to obtain essential imports if trade disrupted (foodstuff, cars)
- Eg. Zambia over-reliant on copper exports; Cuba on sugar exports

#### Evaluation – X sound on theory of CA

- Theory of devt.: justify balanced economic growth **AND** Δpattern of CA naturally (discover new raw materials) or deliberately via policies (education, capital investment, tech research) to acquire CA
- Eg. NIE (HK, SG, SK, Taiwan) due to acquired skills & gov policies created favourable business conditions

### 5.3 FUTURE CHALLENGES IN INTERNATIONAL TRADE

- Current context: protectionism rising globally since 2008 financial crisis (recession, US trade war)
  - Despite pledges to enhance cooperation to restore global growth (X barriers to trade, X restrictions, measures to stimulate exports)
- FT gains: effective ST; ↓ FT costs, political favour from powerful trade unions within economies
- FT challenges: complicated dom./int. policy to build support for free trade
  - ST: redistributive policies (progressive Y tax, transfers), job retraining/assistance in job search
  - LT: equal access to health/education/financial services

#### SECTION SUMMARY

- Protectionist measures such as tariffs, quotas and export subsidies can be implemented to reduce the adverse effects arising from free trade. Reasons to engage in protectionism include protecting sunset industries, protecting infant industries, protection against unfair trade practices such as dumping and so on
- Potential costs of protectionism include the breeding of inefficiency, complacency and higher levels of unemployment in the long-term. Retaliatory measures from trading partners could offset any initial gains, and total volume of world trade eventually declines
- Protectionist measures are at best SR measures to alleviate the adverse effects arising from free trade

## **6. GLOBALISATION**

**Globalisation** is the growing economic inter-dependence of countries worldwide through increasing volume and variety of cross-border transactions, in goods and services, in flows of capital, and in labour migration

- ↑ int. trade in G&S in world ec, ↑ int. flow of capital (ex FDI), ↑ int. labour migration (human capital)

### **6.1 FACTORS AFFECTING GLOBALISATION** – two broad trends supporting globalisation

- Technology advancement (↓ cost of communication & transportation dividing markets)
- Government policies (↓ barriers to trade & investment)

→ **Technology improvements** – ↓ transport costs, ↓ imperfect info/factor immobility, delay iDisEOS onset

#### 1. Transport technology – theory of CA: 0 transport costs

- High transport costs impede int. trade, ↓ gains from S&T → tech advancements incentives, ↓ costs
  - Consumers: cheaper to import more goods than buy local, boost trade (goods movement)
  - Firms: more willing to shift production overseas, benefits of lower COP (offshore/outsource), ↑ πs, sell at more competitive prices (capital movement) [Nike/Adidas factories to Vietnam]
  - Labour: increased movement of labour in search of better jobs (labour movement)
- Ex. modern cargo airplanes: ↑ fuel efficient, transport G cross continents | emergence of large sized ships + containerization → iEOS (technical 2), ↓ costs of moving goods around the world

#### 2. Communication technology – ↓ imperfect info (improvement in infocomms/ndia digital infrastructure)

- ↓ communication costs via the Internet (↑ interconnectedness, info avail)
  - Firms: obtain consumer trends & market info easily & quickly, ✓ export G to other countries
  - Consumers: ✓ find other G&S produced int., consumers ✓ import more foreign G&S
  - Trade contracts settled quickly: facilitate communication & agreements, consumers order direct from int. suppliers (eBay, Amazon, direct brand eStores)
  - Secure electronic payment systems (Paypal): boost cross border transactions, ↑ M & X
- Outsourcing jobs: Why? reduced coordination costs; encourage MNCs to relocate
  - Result: G&S produced anywhere, further specialisation & trade in services along theory of CA
  - Eg. information processing, customer call centre jobs to India & Philippines |
- Overall: ↑ access to foreign markets & outsourcing/offshoring → greater flow of investments, hot money, speculators have greater information to find best rate of return (↑ capital flows)
- Ex. 1946: 3-minute telephone call from US to UK cost \$12 | today: almost free

#### → **Economic policies**

##### 1. Removal of trade barriers (theory of CA: absence of trade restrictions which limits volume of world trade)

- Free-market ec.: ↑ productive potential, new opportunities for int. trade & investment (WWII – 2010)
  - [X effect] New opp. in foreign market → firms build foreign factories, establish production & marketing arrangements with foreign partners → gov ✓ ↓ trade barriers for ↑ S&T gains
  - [M effect] greater trade flows; use tariffs diagram to provide rigour
- How? WTO multilateral negotiations, ↑ no. & scope of regional FTAs, stimulate trade in G&S

##### 2. Increase in market liberalisation and deregulation (1980s – major service industries)

- Deregulate industries: ↑ competition, attract firms (local/foreign) for potential πs **AND** foreign investors, ↑ capital inflows into economy → globalisation occur
  - Ex. UK: nationalised telecoms industry privatised in 1984 to form BT group
  - Ex. SG: privatisation wave started in 1986; Public Sector Divestment Committee examining state-owned enterprises and government-linked corporations for their readiness to be privatised (SIA, Singtel, Keppel corp, POSBank)
- Reduce capital controls: ↑ hot money flows between countries
  - OECD: global portfolio investment volume grown from > USD 10 trillion 1997 to ~ USD 50 tril 2010

##### 3. Increase in education level and removal of immigration restrictions

- Increase edu levels: ↓ immobility of factors (labour), ↑ literacy worldwide, ↑ tertiary ed lvls (↓ occupational immobility), ↑ participation of women in higher edu and workforce (late 20<sup>th</sup> century)
- Removal of immigration restrictions: ↑ size & skills of labour force (recipient), ↑ quantity & quality of labour resources, deepen human capital, achieve CA, reap benefits of S&T, drive globalisation

- Ex. integration of eastern bloc countries into EU, cross-border migration of labour between EU countries increased significantly (Poland/Romania to western European countries)

## 6.2 EFFECTS OF GLOBALISATION

- Impact on source/recipient country (labour/capital outflows)
- Microeconomic costs and benefits: impact on firms'  $\pi$ s, level of competition & externalities (efficiencies), price & variety for consumers
- Macroeconomic costs & benefits: impact on macroeconomic goals

**Effects of Foreign Direct Investment FDI** – globalisation  $\uparrow$  int. flow of capital

FDI refers to the acquisition or construction of new plants and equipment in a foreign economy

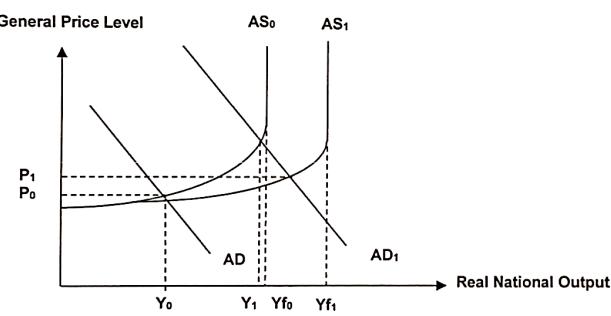
- Capital movement: foreign ownership & control of production facilities when parent company obtains sufficient shares in foreign company to assume control
- Who: MNCs in more than one host country (ex. Mitsubishi, Toyota, General Electric, ExxonMobil)

→ Benefits of FDI to the **Recipient Country** – economic growth, other positive spill over effects

### Macroeconomic benefits

1. Sustained ec. growth & increased employment – FDI supplement private dom. I,  $\uparrow$  DD capital G&S

- SR:  $\uparrow$  AD,  $\uparrow$  RNY & actual ec. growth – developing economies suffer from low I levels due to low domestic savings  $\rightarrow$  productive facilities via FDI,  $\uparrow$  job opp,  $\uparrow$  DD workers,  $\uparrow$  wages (all workers)



- LR: potential growth – higher fixed capital accumulation levels, technical & managerial expertise, new production technologies transferred to local workforce,  $\uparrow$  quantity & quality of resources,  $\uparrow$  productivity,  $\uparrow$  productive capacity,  $\uparrow$  AS  $\rightarrow$  potential growth

Figure 4: Effects of FDI on recipient

2. Improvement in BOP – capital and financial account of BOP and current account

- Production & exports of goods by foreign MNC,  $\uparrow$  export revenue,  $\uparrow$  CA & BOP, ceteris par.

### Microeconomic benefits

- $\uparrow \pi_s$  domestic firms: transfer of management expertise & technology due to presence of MNCs
  - Shared scientific facilities/services,  $\uparrow$  interaction & collaboration btwn leading industry & public research laboratories  $\rightarrow$  develop innovative & high value products,  $\uparrow$  eEOS,  $\downarrow$  costs
  - SG Biopolis: big pharmaceutical companies (GlaxoSmithKline, Eli Lilly, Eisai) & contract research organisation (Quintiles, Covance, ICON) in regional centres in country  $\rightarrow$  instrumental in developing SG's Biomedical Sciences industry
- $\uparrow$  dynamic efficiency & productive efficiency: advanced tech by MNCs,  $\uparrow$  comp. w dom. firms,  $\uparrow$  product & process innovation to survive AND minimise costs, passed on to consumers w  $\downarrow$  savings
- $\downarrow$  allocative inefficiency & market dominance: local monopolies face  $\uparrow$  pressure from foreign competition, less able to charge higher prices
- Improve equity:  $\uparrow$  corporate tax revenue in host country, gov redistribute to lower Y households

→ Costs of FDI to the **Recipient Country**

### Macroeconomic costs

1. Decreased domestic investment – FDI substitute domestic I

- Why 1? foreign MNCs have edge in technical/managerial expertise, accelerate obsolescence of traditional tech adopted LDCs, crowd out domestic I, negate  $\uparrow$  RNY &  $\uparrow$  structural UnE
- Why 2? Footloose nature (highly mobile, likely to shift operations) of MNCs  $\rightarrow$  adverse  $\Delta$ s in host
- Result: overdependence on foreign investment, susceptible to sudden FDI outflows

2. Worsening of balance of payments and exchange rate instability (M inputs, repatriation of  $\pi$ s to source)

- Capital inflows, appreciation of domestic currency, M relatively cheaper in dom. currency, X more expensive in for. currency  $\rightarrow$   $\downarrow$  export competitiveness of goods,  $\downarrow$  RNY & CA

- Instability in XR, difficult for LT planning, uncertainty, funds outflow (financial crises), difficult for gov to stabilise economies

### 3. Increased structural unemployment

- Automated industrial cleaning solutions (robots), replace cleaners (low skilled, occupationally immobile)
- AI powered chatbots (banking, education, gov 'askJAIME' replace customer service staff)
- Computer vision security solutions deployed @ airports/immigration gantries (M'sia border), replace immigration staff

### **Microeconomic costs**

#### 1. Reduced competition among firms – foreign firms stifle efforts to develop domestic industries

- SMEs X compete, ↑ monopoly power within industry (MNC undercut local competitors/offer better quality products), drive out domestic firms, ↑ market dominance, ↑ **allocative inefficiency**

#### Counterargument

- Structural change weed out inefficient firms, ↑ scarce resources to more productive sectors, ↑ innovation, move-up value chain, ↑ productivity → potential growth, ↑ jobs w higher wages
- Germany: job losses since 1995, creation of 3 mil jobs in higher value-added sectors (creative destruction)

#### 2. Negative production externalities

- DCs: stringent production requirements; ✓ cleaner but more expensive production methods
- LDCs: less stringent environmental regulation, encourage MNCs to relocate pollutive industries
  - FDI generate -ve production ext. (pollution, ↓ nmSOL in host) **AND** poor working conditions

#### Counterargument

- Key contributor to negative production externalities is higher level of production (encourage deforestation), urbanisation and transport due to globalisation
- Growing level of education & comm. tech expose poor working conditions, ↓ firms less likely
- Germany: job losses since 1995, creation of 3 mil jobs in higher value-added sectors (creative destruction)

#### 3. Widening income gap – investment by MNCS benefits workers in industrialised sectors

- ↑ inflow of FDI, industries expand, workers learn new skills, enjoy ↑ job prospects & wages
- Non-trade sectors (localised services): remain stagnant
- Result: small pockets of wealth in sectors w greater FDI inflows, poor in sectors w little/no FDI inflows → unequal wage growth, ↑ income disparities within country
- Ex. 1970s lower-skilled European/US workers: real value of wages fall more than 20% (X banking/finance)

### **Policy responses**

- XR instability: control over XR/capital flows (esp during economic crisis), macroeconomic stability
  - Restrictions on maximum percentage profits repatriated to source country
  - Output of foreign MNCs subject to domestic content requirements on factor inputs OR foreign MNCs tie up with local firms for business ventures/ban from investing in key industries
- Macroeconomic costs: ↑ regulation (anti-competitive behaviour, reduce -ve prod. ext. on society)
  - SSP (grants) – encourage use of better technology, help firms compete with MNCs
  - SSP (education) – improve skills level of workers
  - Transfer payments/subsidies – redistribute income, ↓ widening Y gap, social stability

### → Benefits of FDI to **Source Country**

#### **Macroeconomic benefits**

##### 1. Actual growth and improvement in BOP

- ↑ export revenue: FDI expands potential market for MNCs, export to untapped markets **AND** subsidiaries overseas need capital equipment/material inputs to run, stimulate machinery/capital good exports from source country → ↑ AD and actual growth, ↑ current account
- Other industries' ↑ exports: why? recipient develop, ↑ employment, Y & ec. growth → ↑ purchase G&S (imports from source country), ↑ export sales for other industries in source country
- LT: outward FDI generate return flow of Y → why? profit repatriation by MNCs, ↑ CA/BOP, cft.par.

## Microeconomic benefits

### 1. Increased profits for firms – offshore/outsource due to

- ↓ COP (labour costs): Apple's manufacture & assembly in Shenzhen China w ↓ labour costs
- ↓ transport costs if production base closer to target consumer market: Apple enjoy further cost savings as Chinese market is at the doorstep of production plant in China

### 2. Lower prices for consumers – enjoy improvement in consumer welfare

- How? firms pass on part of cost savings from goods imported to the source country

## → Costs of FDI to the Source Country

- Worsening capital and financial account of BOP: why? outflow of investment
- ↑ UnE (FDI outflow is outsource/offshoring): workers retrenched as firms relocate, structural UnE if low skilled workers are occupationally immobile & lack skills to move to growing industries
  - Caveat: loss of jobs lower than expected; UnE due to tech. advancement than in relocation
- Loss of corporate tax revenue: incomes repatriated back X subject to tax (>USD 125 bil lost globally)

**Policy responses** – mitigate negative impact of FDI outflow, institute degree of protectionism (sec 5.2)

- LR: identify industries that economies have potential CA, implement SSP to upgrade skills of workers to increase productivity & equip workers with relevant skills to take up appointments in new industry

## 6.3 EFFECTS OF INTERNATIONAL LABOUR MOBILITY

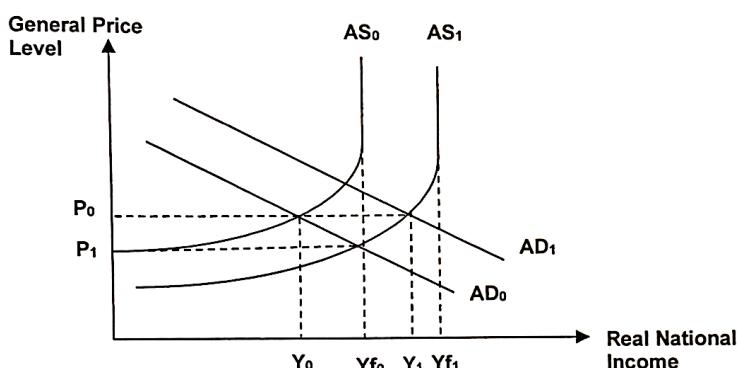
**International migration** – is the movement of people from one country to another in which they plan to reside for a noticeable period of time; labour flows across borders in response to diff in returns (wages)

## → Benefits of International Labour Mobility to the Recipient Country

### Macroeconomic benefits

#### 1. Actual and potential economic growth

- ↑ supply of labour, ↓ wage rate ceter. par., ↓ COP, firms ↑ output level, ↑ AS (down), ↑ πs
  - Note: migrant workers from LDCs V accept lower wages than locals, reduce wage costs



- ↑ labour SS (highly skilled foreign talent), ↑ quantity and quality of labour **AND** further transfer of skills & knowledge to domestic workers, ↑ productivity → potential growth
- Influx of foreign workers boost domestic C of G&S, ↑ AD → actual growth, ↑ RNY & employment

Figure 5: Effect of labour inflows on recipient

- Result: ↑ labour inflows, ↑ AS (down & right), ↑ actual (↑ RNY) & potential growth (↑ full Em lvl)

#### 2. Dampen cost-push inflationary pressures – due to expansion of productive capacity

- ↓ GPL, lower relative inflation rate, boost export competitiveness

## → Costs of International Labour Mobility to the Recipient Country

### 1. Widening income gap – gain X equally distributed

- Migrant workers from poorer country than recipient, willing to work for ↓ wages, wages depressed for jobs where migrant workers are in competition with locals → impact unskilled domestic workers (compete/substitutable by immigrants)
- Highly skilled domestic workers in higher DD (↑ productivity level, sought after by dom/int industries) → likely to keep jobs, ↑ job prospects (local/overseas), ↑ wages & wage increases, worsening Y InEq
- Ex. ↓ people in poverty with rise of globalisation, but Gini coefficient risen (China: 0.2 to 0.4 30 yrs)

### Policy responses

- Training programmes for low-skilled domestic workers: ↑ productivity, less substitutable
- Income support schemes, subsidies on education and public housing: reduce -ve effects of widening income gap

## 2. Drain on government resources arising from immigration of unskilled

- EU free mobility of workers (v stay in any member country), some provide generous welfare payments to economically disadvantaged, attract influx of unproductive foreigners at expense of domestic residents → one key reason behind Brexit (strain on scarce resources, healthcare)

Counterargument – children of immigrants later enter labour force + pay taxes to contribute to economy

- Empirical evidence: immigrants make net positive contribution to public coffers (contribute more in tax payments than in receiving welfare benefits)

## 3. Increase in external cost and fall in non-material welfare

- External costs: overcrowding, infrastructure strain (housing/transport), higher crime, social tensions
- Large influx of foreign workers, raises competition for scarce resources, substantial pressure to public services (education/healthcare)
- Ex. free healthcare → immigration → unnecessary strain on overwhelmed healthcare system, long queues/more patients, healthcare workers X spend more care/time/better quality services, ↓ nmWelfare

Policy responses – measures to restrict inflow of foreign workers

- SG: influx of low-skilled workers restricted by no. of work permits granted by government → Dependency Ratio Ceiling (DRC) sets out maximum permitted ratio of foreign workers to total workforce that a company is allowed to hire
- Varying levies imposed on foreign workers in construction, manufacturing, marine shipyard and service sectors (F&B)

## → Benefits of International Labour Mobility to the **Source Country**

- Remittances from workers abroad constitute major contribution to GNP; finance purchase of basic consumption goods, housing, children's education, and healthcare → v poverty reduction, ↑ SOL
  - World Bank Study: remittances to LDCs grew 10% to US\$689 billion in year 2018
- Source of capital for small businesses and entrepreneurial activities
  - How? HH save excess repatriated Y in banks, source of funds used for investment purposes → actual & potential growth in the economy
- Contribute to BOP: ↑ remittances from emigrated workers, ↑ Y flows from abroad in CA, ↑ BOP

## → Costs of International Labour Mobility to the **Source Country**

### 1. Brain drain, dampens potential growth

- **Brain drain** involves the outward migration of highly educated and skilled people in search of better prospects in foreign countries → source country suffers loss of human resources, limit potential ec.g.
- Higher opportunity cost (mkt wage) to source country when skilled labour in short supply
  - Benefits (+ve ext.) forgone – eg. innovative ideas resulting in innovation & improvement in level of technology **AND** subsidised education (invested in accumulating human capital), outward migration represents wastage of scarce resources on expected social rate of return
  - Ex. India loses many of brightest IT specialists and engineers to Silicon Valley in US

## 6.4 ROLE OF ECONOMIC COOPERATION & TRADE AGREEMENTS

**Free trade agreements** are legally binding agreements between two/more countries to reduce/eliminate barriers to trade (such as tariffs, customs procedures, rules, and restrictions)

- Economic cooperation: preferential trading arrangements between countries
  - Ex. tariff reductions, removal/reduce barriers to trade, investment, labour movement, preferential trading (free-trade areas, customs unions, common markets)
- Aim: ↓ /eliminate trade barriers, encourage closer economic integration, drive globalisation
- How? remove/reduce barriers for G&S/labour, improve market access

**A Free-trade areas** – are where member countries reduce/remove tariffs and quotas between themselves but retain whatever restrictions each member chooses with non-member countries

### Examples of free-trade areas

- Regional Comprehensive Economic Partnership (RCEP) – one of SG's most recent FTAs; world's largest FTA, 30% of global GDP, 1/3 of world's population
  - 15 countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, SG, Thailand, Vietnam, Australia, China, Japan, Republic of Korea, New Zealand)
- TPP11/CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership)
  - Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, SG, Vietnam
- North American Free Trade Association (NAFTA) – USA, Canada, Mexico
- ASEAN FTA – Brunei, Cambodia, Indonesia, Laos, M'sia, Myanmar, the Philippines, SG, Thailand, Vietnam

**B Custom unions** – are like free-trade areas, but in addition, members must adopt common external tariffs and quotas with non-member countries

**C Common markets** – are where member countries operate as a single market

- No tariffs/quotas between members; common external tariffs & quotas (like custom unions)
- Difference: free capital and labour movement
- Ex. **European Single Market** – 27 member states (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, Spain)

**D Monetary union** (ie. currency union) – an intergovernmental agreement involving two or more states sharing the same currency; accompanied by single monetary policy & establishing central bank

**E Economic union** – trade bloc composing of a common market with a customs union

- Participants have common policies on product regulation, freedom of movement of G&S/FOP (capital and labour), and a common external trade policy
- Integration of monetary & fiscal policies → members coordinate policies, taxation, G spending, use common currency [note: EU X have a fiscal union]

**Summary of Different Stages of Economic Integration**

Type	No trade barriers	Common External Tariff	Factor and asset mobility	Common Currency	Common Economic Policy	Examples
Free Trade Area	✓					AFTA, CPTPP, US-Japan FTA
Customs Union (CU)	✓	✓				South African CU, European Union CU
Common Market	✓	✓	✓			European Single Market
Monetary Union (MU)	✓	✓	✓	✓		Euro, West African MU
Economic Union	✓	✓	✓	✓	✓	European Union <sup>7</sup>

**Impact of free trade agreements** – similar to impact on FT, movement of capital, movement of labour

### 1. Impact on consumers/employees – benefit from FTs

- Lower prices: X tariffs, cheaper imports (trade w countries w CA in production of M) **AND** domestic producers forced to ↓ costs to compete with imports, cost savings to consumers → ↑ PE/CS
- Wider variety of G&S: intra-industry trade, consumers enjoy different brands/varieties within

#### Counterargument

- Structural unemployment: cheaper imports, domestic firms shut down/scale back production, lay off existing workers → if retrenched workers lack skills to move into new sectors demanding different skillset → structural UnE

### 2. Impact on producers – benefit from higher profits

- Increased DD: X tariffs on products, goods more price competitive in importing countries **AND** access to larger market, increase demand for product, increase total revenue & πs, cet. par.
- Fall in average costs: larger scale of production, greater scope for specialisation & division of labour within firm, more significant EOS + access cheaper M FOPS → larger ↓ in AC, higher profits, cet. par.

#### Counterargument – domestic firms suffer

- Imports enter country, compete with domestic firms selling substitute products → firms X compete with cheaply priced imports, forced to shut down

### 3. Impact on government – FTAs help government achieve macroeconomic goals

- X restrictions/tariffs, expand firms' export markets, ↑ (X – M), ↑ AD → stimulate economic growth
- ↑ output, jobs created → lower rates of unemployment

#### Counterargument – liberalisation of trade ↑ structural UnE and income inequality

- ↑ DD workers in industries country has CA in, ↑ wages for some industries → Y inequality worsen
- X tariffs, ↑ imports → CA deficits (esp if dom. firms X export to foreign markets)

## **7. GLOBALISATION – THE SINGAPORE CONTEXT**

### **7.1 GLOBALISATION IN SG – importance, benefits, costs**

- Garnered speed in past 20 years with signing of many FTAs
  - 27 regional & bilateral FTAs as of 2022
  - Bilateral FTAs: Japan, Australia, New Zealand, US, European FTA
- Importance of globalisation: SG very small open economy, limited population size/domestic market to sell G&S **AND** lack resources/raw materials (land, labour); with globalisation
  - Huge global market + access to imported raw materials & labour
  - FDI from MNCs: employment opportunities for Singaporeans, transfer of technology & management expertise to firms, add to fixed capital formation in SG
- Negative implications of globalisation: widening Y gap, ↑ vulnerability to external shocks
  - Challenges: more inclusive growth, greater wealth creation for most vulnerable group

### **7.2 FUTURE CHALLENGES FOR SG**

#### **1. Reducing demand for conventional roles**

- Why? advances in info systems, communications, related technologies, shrink economic distances between nations & markets, ↓ DD for some conventional roles
- Extent: ↑ ec.s embrace open door trade & investment policies → competition for investments, export markets, skilled labour intensifies + SG's hub roles duplicated by lower cost regional rivals
- Eg. SG considered service hub in SEA region, M'sia ↑ competitive w same geographic advantage, ↑ pool of labour, harness greater use of information & communication technology

#### **2. Inward-looking attitude of major trading partners of SG (esp US)**

- US foreign & trade policies: greater protectionism → problem for SG: SG economy relies heavily on global trade; ✓ towards tapping immense market potential of trading partners in region (India/China) + manage negative aspects of ↓ trade from more traditional trading partners

#### **3. SG's ageing population adapting to new wave of industrialisation**

- Novel digital technologies: employ ↓ labour, eliminate middle-class manufacturing jobs, ↑ InEq → significant adjustment costs incurred in adapting to such new technologies

**Solutions – strength of local enterprises becoming increasingly important in globalised world**

- Why? ability to shift to higher value-add activities, improve productivity → keep SG competitive

### **7.3 CONCLUSION – globalisation is deeply controversial**

- Dambisa Moyo: 2017 World Economic Forum – ‘there have been significant losses from globalisation’
- Benefits: help poor countries/citizens develop economically, raise SOL
- Harms: unfettered international free market benefit MNCs at expense of local enterprises, local culture, common people | UnE in DCs, worker exploitation in LDCs, environmental destruction
- Resistance: social/people & governments manage flow of capital, labour, goods & ideas → result: anti-globalisation sentiment: age of hyperglobalisation is over, diminishing returns
- Challenge: effectively maximise potential benefits, minimise inevitable unintended adverse consequences through gov. policies

#### **SECTION SUMMARY**

- Globalisation is the growing economic interdependence of countries through cross-border transactions, in goods and services, in flows of capital, in spread of technology, as well as in labour migration
- Economies across the world are becoming more integrated through preferential trading arrangements made between countries to reduce or eliminate trade barriers between them
- Globalisation brings both benefits and costs to economies. The main challenge for governments is to effectively maximise the potential benefits and minimise the inevitable unintended adverse consequences

# UNIT 6 –MACROECONOMY: INCOME & EMPLOYMENT DETERMINATION

## 1. AGGREGATE DEMAND (AD) & AGGREGATE SUPPLY (AS)

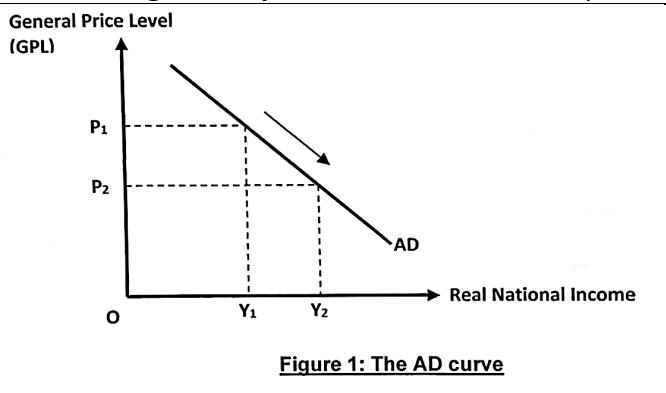
- Understanding determinants of economic growth, unemployment, inflation

**1.1 AGGREGATE DEMAND (AD)** refers to the total level of spending for an economy, based on the amount of domestically produced goods and services which households, firms, government and foreigners desire to buy, at each general price level; reflects total demand/expenditure on domestically produced G & S

$$AD = C + I + G + (X - M)$$

- Measure: sum up consumer spending by households (C), investment expenditure by firms (I), government spending (G), net export expenditure ( $X - M$ )
  - Remove M (all expenditure by economic agents on imported G&S)

→ **Answering techniques** – inverse relationship between GPL and level of real national output or income



- Ceteris paribus: higher GPL, lower QD of all G&S: GPL falls from  $P_1$  to  $P_2$ , QD of G&S in economy increases, rise real value of in output demanded from  $Y_1$  to  $Y_2$
- Explained by wealth, interest rate, international trade substitution effects → explains AD curve shape
  - AD curve shape – inverse relationship between GPL and real national output

Wealth effect: GPL falls, purchasing power of households increases

- Assume unchanged nominal income,  $Y$  used to buy more G&S, consumers wealthier, encouraged to spend more, larger QD of G&S, households better off

Interest rate effect: GPL falls, households need less money to purchase given quantity of G&S

- Given fixed supply of money, fall in demand for money, interest rate (i.e. price of loans) falls
- Lower interest rate encourages borrowing 1. by households for consumption on interest sensitive items 2. By firms for investments in new plants or equipment
- Result – QD of G&S for purpose of consumption & investment increases

International substitution effect: GPL falls, foreign prices remain constant

- Domestically produced goods become cheaper relative to foreign substitutes
- Ceteris paribus, residents more likely to demand less foreign goods, fall in import expenditure
- Foreigners purchase more of relatively cheaper country's G&S
- Result – fall in GPL, higher QD of domestically produced G&S

→ **Non-price determinants of aggregate demand (AD)** – cause shift in AD curve

$$AD = C + I + G + (X - M)$$

- Increase in AD – rightward shift of AD curve from  $AD_0$  to  $AD_1$  → larger QD at every price level

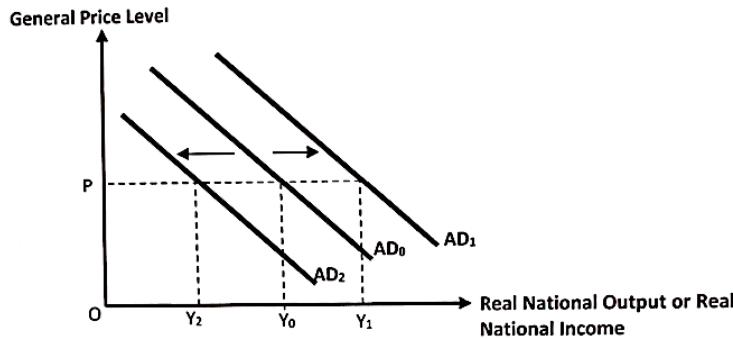


Figure 2: Changes in non-GPL factors / Shift in AD curve

**1. Consumer expenditure C** – incurred by households when  $Y$  used to purchase final G&S to satisfy wants

- Spend on perishables (food), consumer durables (washing machines), services (haircuts)
- Comprises autonomous consumption (refer to factors below) and induced consumption
- Autonomous consumption** refers to consumption independent on current level of real NY

- Dependent on non-income factors (changes in consumer confidence, changes in interest rate)
- **Induced consumption** refers to consumption dependent on current level of real national income
  - Current level of real national income increases, households' ability and willingness to purchase consumer G&S increase, induced consumption increases

### Determinants of consumer expenditure (autonomous consumption)

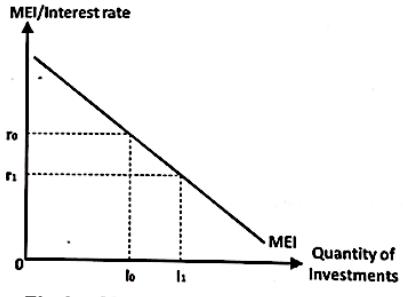
<b>1. Changes in consumer confidence</b> (measure of how optimistic consumers are on future Y & economy)
<ul style="list-style-type: none"> <li>• Consumers <u>expect Y to increase/optimistic about future of economy</u> (sustained &amp; strong GDP growth/world economic recovery), <u>more willing to spend</u> on G&amp;S, <u>consumption increases</u> <ul style="list-style-type: none"> <li>○ One of the reasons why GOV underestimates GDP</li> </ul> </li> <li>• COVID-19 situation worsens, increase likelihood of stricter safety measures, <u>reduce consumer confidence</u>, <u>lower level of consumption</u></li> </ul>
<b>2. Changes in interest rates</b> – consumer spending <u>financed by borrowing</u> , influenced by $\Delta$ interest rate
<ul style="list-style-type: none"> <li>• Fall in interest rates: <u>reduce costs of borrowing</u>, result in <u>increase in borrowing</u> by households to purchase interest sensitive items/big ticket items (new cars)</li> <li>• Returns on savings lower → households <u>increase holdings on money</u> instead of putting money in banks → <u>more spending on G&amp;S</u> → consumption increases</li> </ul>
<b>3. Expectations of future prices</b>
<ul style="list-style-type: none"> <li>• Consumers <u>expect prices to increase in future</u>, increase demand for more G&amp;S as G&amp;S <u>relatively cheaper now than in future</u>, consumption increases, <i>ceteris paribus</i></li> </ul>
<b>4. Distribution of income</b>
<ul style="list-style-type: none"> <li>• <u>Redistribution of income</u> from rich to poor (<u>higher Y taxes</u>) + <u>more benefits</u> for poor, increases C</li> <li>• Why? rich tend to <u>spend less of any increase in income</u> compared to poor           <ul style="list-style-type: none"> <li>○ Portion of Y taken from rich is saved, almost all income distributed to poor is <u>spent on C</u> → redistributive measures to reduce Y inequality <u>likely increases C</u> in economy</li> </ul> </li> </ul>
<b>5. Changes in wealth</b> ( $\neq$ income; income refers to money received by person over period of time: wages)
<ul style="list-style-type: none"> <li>• <u>Wealth</u> – <u>value of assets</u> people own (ex. houses, stocks and bonds, jewellery, works of arts, etc.)</li> <li>• <u>Increase in consumer wealth</u> (increase in stock market values/increase in value of houses), people feel wealthier, <u>more willing to purchase G&amp;S</u> at prevailing income level, <u>consumption increases</u></li> </ul>
<b>6. Changes in personal income tax</b> (ex. 20% tax: \$10k income → \$8k disposable income)
<ul style="list-style-type: none"> <li>• <u>Personal income taxes lowered</u>, <u>higher level of disposable income</u> (total personal income minus personal income tax), consumer possess greater purchasing power, <u>increase consumption</u></li> </ul>

### 2. Investment Expenditure I

- **Investment** is the act of acquiring new fixed capital assets (buildings, plants, equipment, machineries by firms – fixed capital formation)
- Includes accumulation of stocks & inventories (ex. raw materials, semi-finished goods held by produced – changes in physical stocks)

### Determinants of investment expenditure (factors affecting investment: interest rates & non-interest rate)

<b>1. Changes in interest rates</b> → explain multiplier effect
<ul style="list-style-type: none"> <li>• <b>Marginal Efficiency of Investment MEI</b> – refers to expected rate of return (Y or profit) of additional unit of investment; <u>inverse relationship</u> between interest rate and investment           <ul style="list-style-type: none"> <li>○ Ceteris paribus, if <u>interest rate increases</u>, <u>level of investment falls</u>, vice versa</li> </ul> </li> <li>• <b>Rate of interest r</b> – refers to cost of borrowing</li> <li>• <u>Relationship</u>: investment opportunities with varying MEI/expected rate of return → rank investment opportunities from highest to lowest MEI → <u>downward sloping MEI curve</u> derived</li> </ul>
<u>Decision-making process</u> – whether to undertake an investment project, conduct cost-benefit analysis
<ul style="list-style-type: none"> <li>• <b>MEI <math>\geq</math> r</b> – expected rate of return of investment <u>greater/equal</u> to cost of borrowing → <u>undertake I</u></li> <li>• <b>MEI &lt; r</b> – expected rate of return of investment <u>less than</u> cost of borrowing → <u>X undertake I</u></li> </ul>



**Fig 3a: Movement along MEI**

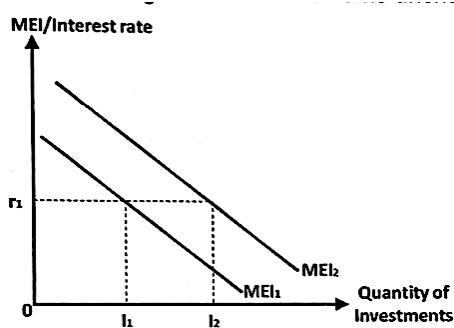
- If interest rate is at  $r_0$ , firms undertake additional investment projects until  $I_0$  units
- Why? MEI/expected rate of returns at least cover  $r_0$  (cost of borrowing)
- Additional units of investment beyond  $I_0$  units unprofitable as  $MEI < r$

### Answering techniques

- Interest rate falls from  $r_0$  to  $r_1$ , more investment projects yielding MEI/expected rate of return greater than or equal to new lower interest rate  $r_1$  increases from  $I_0$  to  $I_1$ , ceteris paribus
- Result – fall in interest rate leads to increase in level of investments, vice versa → downward movement along MEI curve

### 2. Changes in business confidence and expectations

- Business confidence – how optimistic firms are about future sales & level of economic activity
  - Formed by looking at current state of economy, political factors, global situation



**Fig 3b: Shift of MEI**

- Firms more optimistic about future sales & economic activity, business confidence strengthens, expect rate of return on investments to increase, MEI curve shift right from  $MEI_1$  to  $MEI_2$ , level of investment increases from  $I_1$  to  $I_2$  (assume interest rate remains unchanged at  $r_2$ )
- Firms more pessimistic about future of economy, business confidence falls, expect rate of return on investments fall, MEI curve shift left → assume interest rates remain constant, fewer investment projects yield expected rate of return at least equal to prevailing interest rate, level of investments fall, cet. par

### 3. Changes in corporate tax rates

- Government reduces corporate tax on profits of businesses, firms' after-tax profits increase
- Increase firms' willingness & ability to invest, increase in investment expenditure shift of MEI curve from  $MEI_1$  to  $MEI_2$

### 4. Changes in technology (new business opportunities with very high rate of return)

- Improvements in technology stimulate investment spending
- Why? implementation of new technology requires new capital, shifts MEI curve rightwards from  $MEI_1$  to  $MEI_2$  → at prevailing rates  $r_1$ , level of investment increases from  $I_1$  to  $I_2$
- Ex. advances in sharing economy, encourage massive investments in new sectors (use of idle assets – cars, spare bedrooms led to growth of Uber and Airbnb)

Examples for how lowered interest rates might not affect

- Dotcom Bubble (refer to Notion)

### 3. Government Expenditure G – refers to spending by governments on G&S within a country

- Assumed to be autonomous, independent of level of national income in country
- Operating expenditure – run the country (ex. salaries of civil servants/government workers)
- Development expenditure – spending on public works/public investments of infrastructure (building roads, airports, power generators, schools, hospitals)
- Fiscal policy – increase/decrease in G (ie manipulates spending) to achieve macroeconomic goals

### 4. Net Exports ( $X - M$ )

- Export expenditure – refer to G&S produced within the country and sold to foreigners
  - Included in measurement of country's national output or Gross Domestic Product GDP
- Import expenditure – refer to domestic spending on G&S produced in other countries
  - Subtracted from national output or GDP
- Net exports – value of all exports minus imports

## Determinants of Net Exports ( $X - M$ )

### 1. Changes in national income of trading partners/domestic households

Changes in export revenue – influenced by national income of trading partners

- Country A's trading partners' income levels increase rapidly – higher purchasing power (assuming exports are normal goods,  $YED_x > 0$ ), foreign demand for A's G&S rise → country A export revenue increase, ceteris paribus → net export increase
- Trading partners experience recession – reduced income, demand less foreign goods, A's export revenue falls, decrease in net exports, ceteris paribus

Changes in import expenditure – influenced by national income of a country

- A experience rise in national income, residents have greater purchasing power, demand more imports → import expenditure M rise

### 2. Changes in relative price levels between countries

- If A's G&S are substitutes to foreign G&S, A's domestic goods become relatively cheaper compared to foreign substitutes, world market/demand for A's G&S rise, export revenue of A increases
- A's residents buy less of relatively more expensive imported G&S + buy more of relatively cheaper domestically produced import substitutes → reduce A's import spending
- Result – GPL of A's trading partners rise relative to A (inflation rate higher than A), A's net export earnings rises

### 3. Changes in foreign exchange rates

- SG depreciates (weakens) relative to trading partners – SG G&S cheaper in foreign currency, foreigners switch towards purchasing more SG G&S (SG X), increases SG domestic export revenue
- Foreign goods more expensive in SG currency, SG reduce purchase of imports from trading partners → import expenditure decreases
- Result – rise in net exports (X - M), increase AD, shift AD curve to the right

## 1.2 AGGREGATE SUPPLY AS

AS refers to the total output of goods & services that domestic firms as a whole produce and sell at each general price level

- AS curve links level of real national output to GPL; shape determined by degree of spare capacity

### → AS Curve

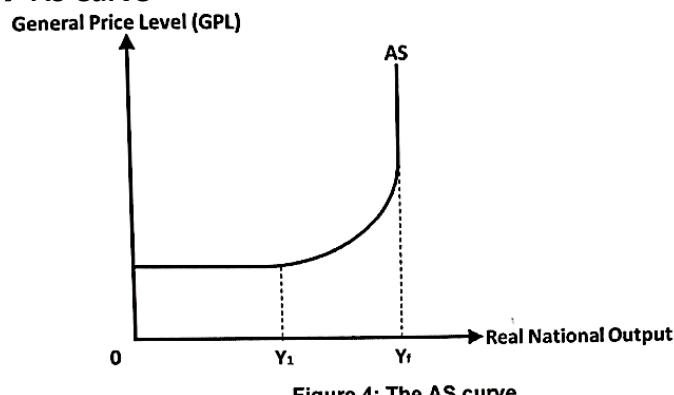


Figure 4: The AS curve

Horizontal (Keynesian range)  $0Y_1 \rightarrow$  AS is perfectly price-elastic

- Real national output increases without any increases in price
- Why? real national output much lower than full employment level  $Y_f \rightarrow$  abundance of un-utilised & under-utilised resources (**spare capacity**) → rise in AD, spare capacity allows producers to increase output production easily without incurring higher costs → X pressure to increase GPL

### Upward sloping (intermediate) range $Y_1$ to $Y_f$

- Increase in real national output accompanied by rise in general price levels
- Why? resources (capital goods, raw materials, labour) become increasingly scarce as production levels rise, resources increasingly employed → less spare capacity → rise in AD, increase in output to meet shortage of goods cause supply bottlenecks to arise in production → rising costs + higher GPL

### Vertical (classical) range $Y_f \rightarrow$ AS is perfectly price inelastic

- No possible increase in output while prices continue to rise
- Why? economy reached full employment + output X longer rise, resources fully employed → rise in AD, only GPL increases with no change in real output
- Change in  $Y_f$  level only brought by changes in productive capacity of the economy

## → Non-price determinants of aggregate supply (AS) – cause shift in AS curve

- Factors affect cost of production/productive capacity of economy; temporary or permanent
- Ex. rise in oil prices reduces current output, X likely to severely alter country's LR productive capacity
- Ex. natural disaster cause temporary & LT decrease in economy's national output → why? productive capacity reduced as resources destroyed

### 1. Downward and Upward Shifts of AS Curve – cost of production

- **Rise in COP** – higher production costs, reduce possibilities of earning profits, firms less willing & able to produce at each given price level, decrease in AS of G&S, shifts AS curve upwards from  $AS_0$  to  $AS_1$
- **Fall in COP** – incentive for more to be produced at every given price level for output, increase AS, shift AS curve downwards from  $AS_0$  to  $AS_2$

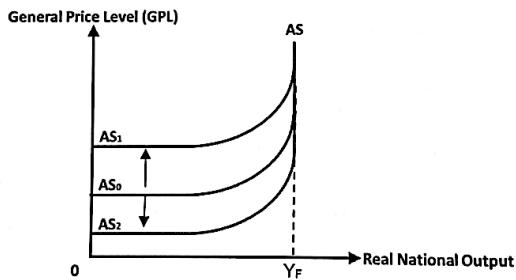


Figure 5: Upward / downward shift of AS

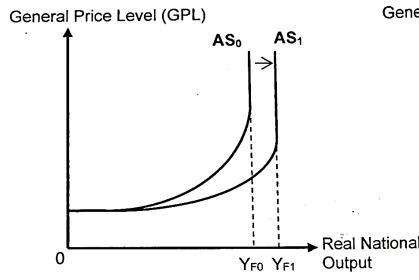


Figure 6a: Rise in Productive Capacity

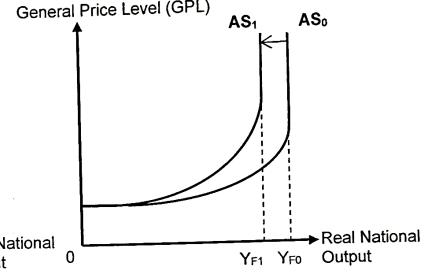


Figure 6b: Fall in Productive Capacity

### 2. Outward and Inward Shifts of AS Curve – productive capacity

- **Rise in productive capacity** – increase in potential of the economy to produce more G&S, potential economic growth occurs, shifts AS curve to right from  $AS_0$  to  $AS_1$ , full employment real output frontier pushed outwards from  $Y_{F0}$  to  $Y_{F1}$  → outward shift of Production Possibility Curve
- **Fall in productive capacity** – inward shift of AS curve and fall in full employment real output level from  $Y_{F0}$  to  $Y_{F1}$

### **3. Determinants of Aggregate Supply**

#### → A Changes in input prices – assume no changes to productive capacity

- Rise in price of inputs (ex. labour, oil, steel), increase production costs, reduce AS
- AS curve shifts upwards from  $AS_0$  to  $AS_1$

#### → B Changes in quantity of resources

- Increase in quantity of resources → why? ex. discovery of new oil wells/mineral mines
  - Ex. discovery & harvest of shale oil lead to increase in quantity of resources in country
- Increases economy's ability to produce more G&S → cet. par. increase economy's productive capacity → increase in AS → shift AS curve to the right from  $AS_0$  to  $AS_1$

#### → C Changes in quality of resources

- Improvement in quality of labour resources (labour productivity)
  - Labour productivity increased through human capital investment (education & training) → improved qualifications, skills and expertise → contribute to workers' productivity
  - Greater productivity of workers, more G&S produced for every input employed → increase productive capacity of economy & full employment output level from  $Y_{F0}$  to  $Y_{F1}$
- Higher productivity translates to lower unit cost of production (assume wages remain constant)
  - Shift AS downwards from  $AS_0$  to  $AS_2$  → lower production cost increases possibilities for earning profits → firms more willing & able to produce more at each given price level
- Improvement in quality of other resources (ex. capital, natural resources) add to a country's productive capacity (possibly through R&D)
  - Ex. improvement of quality of land through improved irrigation systems whereby distributed soil in dry areas can be revegetated → improve no. of agricultural harvests from given plot of land → AS curve shifts right from  $AS_0$  to  $AS_1$  (achieved through R&D)

#### → D Technological advancements

- Reduces unit cost of production (aid discovery of less costly ways of production)
- Increases productive capacity/potential output (augment production for given Q of resources)
- Result – AS curve shifts downwards and to the right
- Ex. 3D printers for manufacturing of goods → 3D printing utilises precise amounts of inputs to produce any good → minimal wastage of resources in manufacturing process, increases efficiency + lower unit cost of production

#### → E Government policies – affect AS through influencing COP and/or productive capacity

- Indirect subsidies to firms – lowers COP, increase in AS → AS curve shifts downwards
- Well-established property rights & contracts, proper law enforcement, crime prevention
  - Lower business costs & reduce uncertainties arising from loss of property & personal injury
  - Encourage savings & investment in long-term capital proj. from local citizens & foreigners
  - Result – rise in investment, positively affect productive capacity of economy
- Ex. government embarks on economic restructuring
  - Policies promoting workers skills upgrading, more incentives for firms to invest in R&D
  - Improves productivity (output/labour), productivity increases, unit COP decreases, AS shifts down

## 2. EQUILIBRIUM LEVEL OF NATIONAL INCOME

- Equilibrium in macro-economy occurs when aggregate demand AD equates aggregate supply
- Equilibrium level of real national income is the level of real national income at this point
  - Level of income towards which the economy tends to; X pressure to change
- Deviation – pressures on firms & consumers move economy towards equilibrium rNY & GPL

### 2.1 IMPACT OF A CHANGE IN AD

- Initial equilibrium level of national income is at  $Y_0$  where  $AD_0$  equals AS

**Situation 1: AD increases** – AD shifts right to  $AD_1 \rightarrow$  disequilibrium as aggregate QD exceeds aggregate QS  
 $\rightarrow$  consumers to bid higher prices for goods  $\rightarrow$  price rises

- AD falls (movement along AD curve) due to wealth, interest-rate, & international substitution effects
- Profit-maximising firms incentivised by higher prices, increase output, employ more workers to increase output (movement along AS curve)
  - Initial spare capacity & idle resources exist, increase in AD cause rundown of stocks & inventories for firms  $\rightarrow$  firms hire more factors of production to increase production  $\rightarrow$  rise in real national output/income from  $Y_0$  to  $Y_1$  reflects actual economic growth
- Result – real national output/income rises towards new eq. level  $Y_1$ , GPL rises to  $P_1$

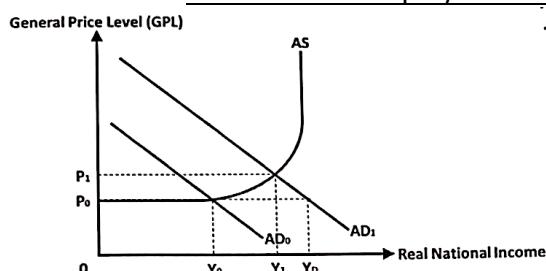


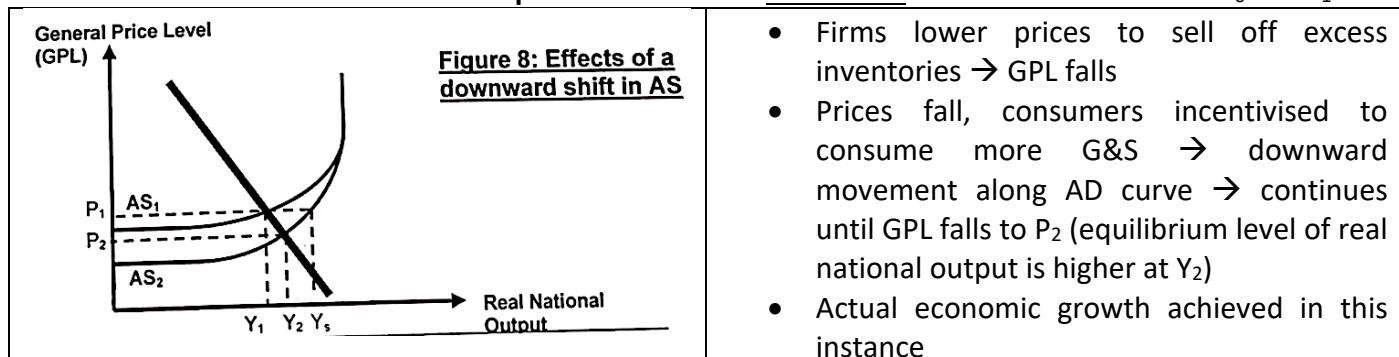
Figure 7: Effects of an increase in AD

**Situation 2: AD falls** – leftwards shift of AD curve, AQS exceeds AQD, firms forced to reduce prices to clear excess inventories & stock  $\rightarrow$  prices fall

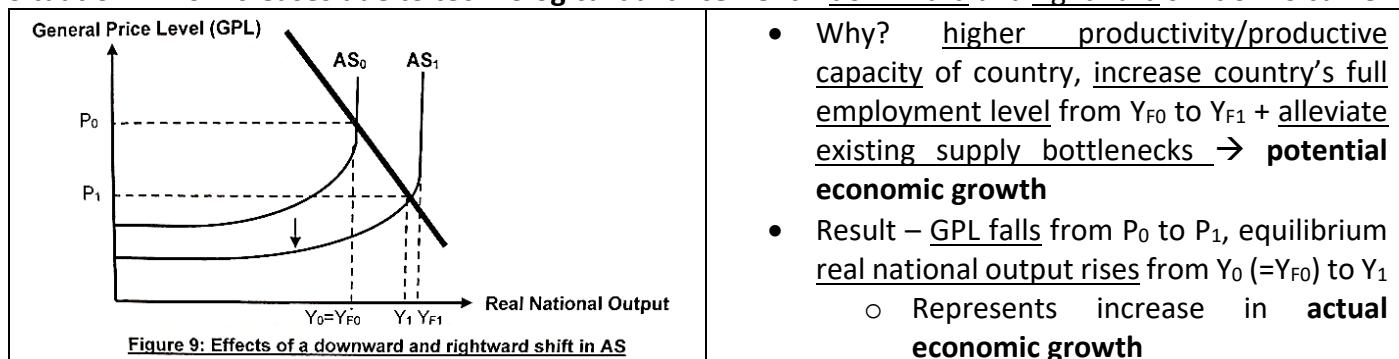
- Firms reduce production & demand fewer workers  $\rightarrow$  real national output/income falls  $\rightarrow$  economy moves to **new lower equilibrium**

### 2.2 IMPACT OF A CHANGE IN AS

**Situation 1: AS increases due to fall in production costs** – downward shift of AS curve from  $AS_0$  to  $AS_1$



**Situation 2: AS increases due to technological advancement** – downward and rightward shift of AS curve



### SECTIONAL SUMMARY

- **Aggregate demand** consists of sum of expenditure by households, firms, government and foreign sector on domestically produced goods and services  $\rightarrow AD = C + I + G + (X - M)$
- **Aggregate supply** reflects the total output of goods and services that domestic firms are able and willing to sell at every price level

- AS curve comprises 3 segments
  - Horizontal (Keynesian) range – abundance of unemployed resources
  - Upward sloping (intermediate) range
  - Vertical (classical) range – economy reached full employment
  - Changes in cost of production shifts AS curve up or down while changes in productive capacity shifts AS curve right or left
- AD intersects AS: equilibrium real national income & general price level for economy is attained
- **Actual economic growth** occurs when the country's equilibrium real national output increases
  - Achieved by increase in AD and/or increase in AS
- **Potential economic growth** occurs when productive capacity increases
  - Achieved only by increase in full employment real output level ( $Y_{FE}$ ) → represented by vertical portion of AS curve

### 3. CIRCULAR FLOW OF INCOME

- Useful model for understanding the workings of an economy
- Illustrates relationship between different economic units & how an economy arrives at a certain equilibrium level of output, expenditure, income

#### 3.1 TWO SECTOR ECONOMY – households and firms

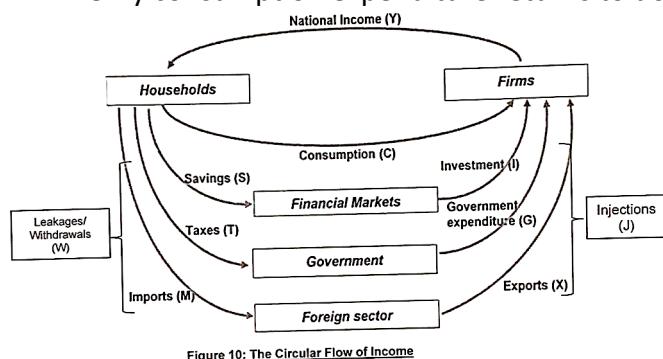
- Households – supply factors of production (labour, land, capital, entrepreneurship) to firms
- Firms – utilise above factor inputs to produce goods and services

→ Circular flow of income refers to how income Y earned by households are spent (consumption expenditure C) on firms' output of goods and services

- Consumption expenditure received by firms as revenue → firms pay households (wages)
  - Factor payments/incomes comprise wages, rental, interest, profits
- Income earned by households translate into consumption expenditure → become firms' revenue for output produced & sold → firms pay income to households
- If households spend all income on buying domestically-produced G&S, firms pay out all revenue received as income to domestic households
- Flow continues indefinitely, unending process → circular flow of income, expenditure & production

Limitations – households X spend all income on domestically produced G&S

- Part of household's Y set aside for savings S, payment of taxes T, expenditure on imported G&S
- Only consumption expenditure returns to domestic economy



→ Leaks/withdrawals W – withdrawn from circular flow

- Lead to contraction in income in circular flow for domestic economy
- Increase in leakages (in terms of savings, taxes, import expenditure), households spend less out of given income on domestically-produced goods → firms receive less revenue to pay income to factor inputs → less income & expenditure in circulation for domestic economy

→ Injections J (into circular flow) – refer to payment of income to domestic producers that do not arise from domestic household consumption

- Include investment expenditure from financial markets (banks), government sector, foreign sector
- Comprise investment expenditure I, government expenditure G, export expenditure X
- Injection I/G/X → increase income in circulation for domestic economy

Result – equilibrium is reached when W = J

#### SECTIONAL SUMMARY

- Circular flow of income model depicts flows of income and goods & services in economy
  - Shows flow of G&S from firms to households and flow of factor inputs from households to firms
- Withdrawals from and injections to circular flow
  - Withdrawals/leakages – refer to any part of household income that is not spent on domestic goods and services; include savings, taxes, and import expenditure
  - Injections – refer to any payment of income to domestic firms that do not arise from domestic household consumption; include investment expenditure, government expenditure, export earnings
- Circular flow of income demonstrates how economists calculate national Y/gross domestic product GDP
- GDP measured in 3 equivalent ways
  - Value of all final goods and services produced
  - Total factor incomes (including profits) earned from production of these goods and services
  - Total expenditure on these newly produced goods and services

## **4. THE MULTIPLIER – multiplier effect**

- AD increases (increase in any C/I/G/(X – M)), lead to more than proportionate increase in national Y
- AD decrease, lead to more than proportionate decrease in national income

### **4.1 THE MULTIPLIER EFFECT**

**Multiplier k is as follows:**

$$k = \frac{\Delta NY}{\Delta AD}$$

where  $\Delta NY$  = change in equilibrium national income |  $\Delta AD$  = change in spending

- Multiplier is a numerical coefficient; change in autonomous spending C/I/G/X – M is multiplied to show final change in equilibrium national income

→ **Assumptions made on theory of multiplier** (TIP! limitations/evaluation points in essays)

- Availability of spare capacity in the economy
- No change in general price level
- A constant state of technology
- Absence of time lags

→ **How multiplier effects occur** – explain through numerical tables, AD-AS diagram, circular flow model

#### Principle

- The multiplier process works on the principle that one person's spending generates income for the next, and the process goes through many rounds of induced spending to increase national income by a larger magnitude compared to initial autonomous increase in AD

#### How it starts

- Firms makes investment by building new factory on Jurong Island OR government increases spending by extending MRT line → creates income for people directly employed
- These people in spend part of their income on domestically produced G&S (ex. restaurants, cinemas, supermarkets)

#### How it continues

- Income-induced consumption – create more employment (increased hiring in restaurants), output, and income for other people in the economy
- Income generated for next group of people lead to consumer expenditure + induced consumption for economy → another round of employment, output and income generated

#### Outcome

- Increase in investment cause much bigger increase in national income
- Magnitude of increase depends on rate at which income leaks out (MPW – marginal propensity to withdraw) or rate at which income is spent on domestically produced G&S (MPC – marginal propensity to consume on domestically produced G&S)

→ **ANSWERING TECHNIQUES: The Multiplier Process** (numerical ex. with table, based on increase in I)

#### **Assumption made in multiplier in a 4-sector economy**

- Investment increases by \$100m
- MPC (on domestically produced goods & services) = 0.6
- Economy is operating below full employment output level

#### 5 steps to explaining

##### **Step 1: Principle**

- The multiplier process works on the principle that one person's spending generates income for the next, and the process goes through many rounds of induced spending to increase national income by a larger magnitude compared to initial autonomous increase in AD

##### **Step 2: How it starts** (suppose any hypothetical change in AD)

- Due to rise in investment expenditure, firms affected by investment projects employ more factors of production (ex. labour) to produce more output → \$100m received by firms paid to FOPs → \$100m income generated for people hired by firms to deliver the investment projects
  - Factor inputs – labour (engineers, project managers, construction staff, safety officers)
- National output/income rises by \$100m → first round of output & Y generated

### Step 3: How it continues

- Of \$100m, some of is **withdrawn** (savings, income taxes, spent on overseas/imports)
  - Induce rise in consumption expenditure on \$60m domestically produced G&S (**MPC = 0.6**)
  - Remaining \$40m withdrawn from economy (saved, paid to taxes, spent on imported goods)
- **\$60m increase** in induced consumption creates \$60m worth of new output & Y for domestic ec.
  - Second round of output and income of \$60m generated for those X directly hired by firms
  - Households earned \$60m of income increase consumption by \$36m (**MPC = 0.6**) → generate third round of output and income of \$36m for economy

### Step 4: How it stops

- Process where expenditure generates income → income induces expenditure goes on until initial injection of \$100m totally leaks out as withdrawals
- Multiplier eventually stops when **total withdrawals W = initial injections J**
  - After each increase in real national income, additional induced consumption generated becomes smaller due to leakages until condition above is fulfilled

Why the multiplier process does not continue indefinitely

- After each round of increase in real national income, additional induced consumption generated becomes smaller and smaller due to leakages in economy (in form of savings, taxes, imports)
- Whole rippling process continues until cumulative sum of withdrawals equals initial increase in J

### Step 5: Outcome

- The initial increase in autonomous spending (G in this case) leads to a more than proportionate increase in real national income

**Table 1: The multiplier process, triggered by a rise in investment of \$100m, and MPC = 0.6 and MPW= 0.4**

Time Period (Number of Rounds)	Increase in National Income (\$m)	Induced Increase In Consumption (\$m)	Increase in Withdrawals (\$m)
1	\$100	\$60	\$40
2	\$60	\$36	\$24
3	\$36	\$21.60	\$14.40
:	:	:	:
Total	\$250	\$150	\$100

- Change in national income is 2.5 times the initial change in investment ( $\Delta Y = \Delta I \times \text{multiplier } (k)$ )

**In a 4-sector economy (includes government and foreign sector)**

$$k = \frac{\Delta NY}{\Delta \text{autonomous AD}} = \frac{1}{MPW} = \frac{1}{1 - MPC} = \frac{1}{MPS + MPT + MPM}$$

where MPS = marginal propensity to save (change in savings in response to change in national income)

where MPT = marginal propensity to tax (change in tax paid in response to change in national income)

where MPM = marginal propensity to import (change in import expenditure in response to change in NY)

- Multiplier bears direct relationship with MPC and inverse relationship with MPW
  - MPW – marginal propensity to withdraw (rate at which income leaks out)
  - MPC – marginal propensity to consume (rate which Y is spent on domestically produced G&S)
- Larger the MPC, larger the size of k | larger MPW (higher leakage), smaller size of k

## → Multiplier process explained by AD-AS approach

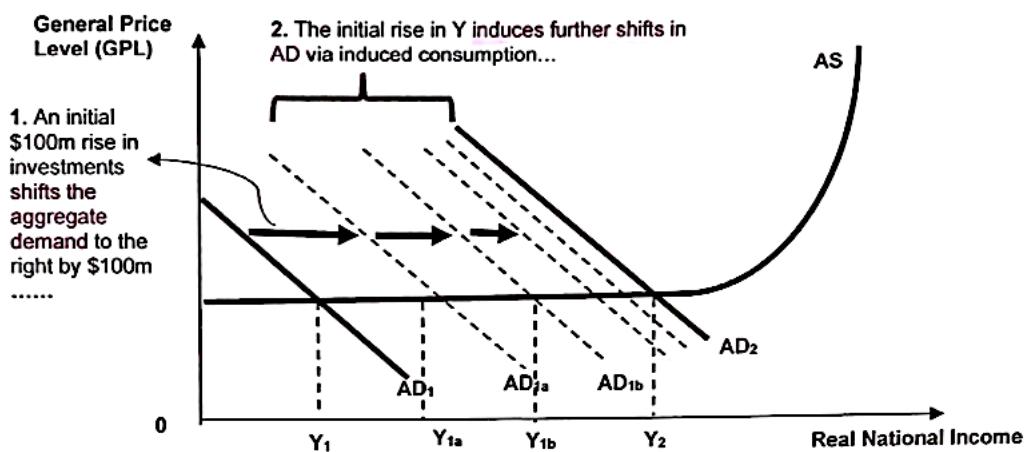


Figure 11: The Multiplier Effect using AD-AS graph

- Increase in investment by \$100m, equivalent increase in AD
- AD increases, AD curve shifts right from  $AD_1$  to  $AD_{1a}$  by \$100m
  - To meet rise in demand, firms affected by rise in investment expenditure produce more output + hire more factors of production → pay out income to FOP in return for Q produced
  - Result – real national output/income increase by \$100m from  $Y_1$  to  $Y_{1a}$  (Round 1 of NY & Q)
- Households spend proportion of increase in income on buying domestically produced G&S
  - Proportion based on marginal propensity to consume
  - Increase in induced consumption (\$60m) causes  $AD_{1a}$  to rise to  $AD_{1b}$
  - In response to rising demand, increase production → increase income by \$60m
  - Second round of income induces further consumption (\$36m) → increase AD + Y
- Process whereby expenditure generates income creates cycles of spending and re-spending

Multiplier X continue infinitely due to presence of withdrawals (savings, taxes, import expenditure)

- Additional increase in spending & income to be fraction of previous addition to circular flow → rightwards shift in AD curve becomes smaller and smaller each successive round
- Multiplier process stops when cumulative sum of W equals initial increase in AD

Size of multiplier k (if  $k = 2.5$ )

- Income rises by 2.5 times given autonomous increase in investment ( $Y_1 Y_2$  2.5 times  $> AD_1 AD_{1a}$ )
- Assumptions made regarding state of economy for full multiplier to be achieved
  - 1. High degree of spare capacity 2. Constant general price level 3. Constant technology
- Holding above assumption true, overall \$100m increase in AD is from  $AD_1$  to  $AD_2$  and multiplied increase in real national output & income (\$250m) from  $Y_1$  to  $Y_2$  → reflects higher quantity of output produced with employment of previously idle resources → signifies actual economic growth

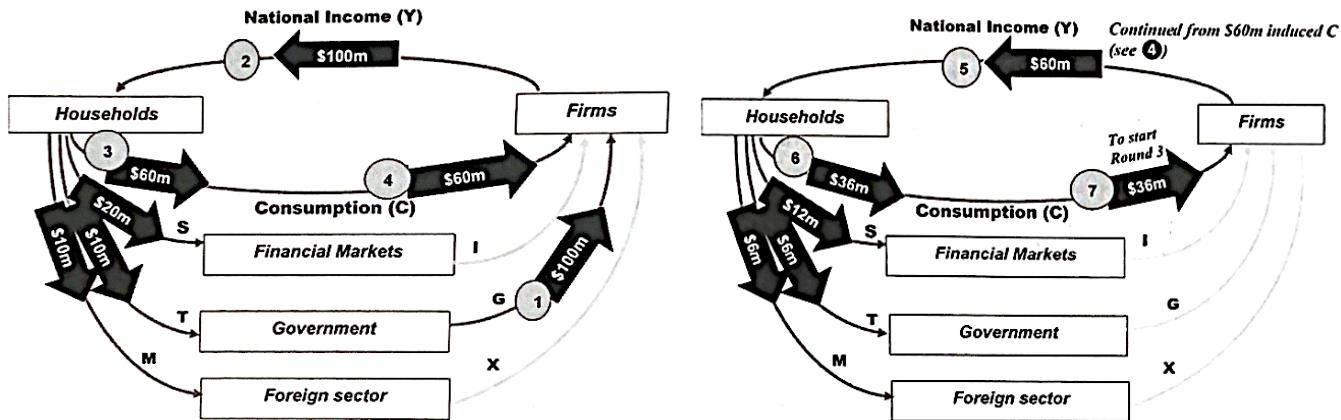
## → Multiplier process explained with the Circular Flow Model

- Government increases its spending on extending the MRT line by \$100m
- $MPC = 0.6, MPW = 0.4$  ( $MPS = 0.2, MPT = 0.1, MPM = 0.1$ )

Multiplier process (explained)

- Government injects \$100m into economy at (1) → firms providing construction and related services earn \$100m → money distributed to FOP + become income of households at (2)
- $MPC = 0.6 \rightarrow$  households do not spend all income on consumption, only 60% of additional income spent on consuming domestically produced G&S → \$60m flow back to domestic firms at (3) → rest of \$40m withdrawn → induced consumption of \$60m re-injected back into economy at (4)
- Induced consumption leads to round 2 of increase in NY of \$60m at (5) → induces another round of consumption of \$36m at (6)
- Process whereby expenditure generates incomes, and income induces expenditure is repeated
- Cycle continues for subsequent rounds but does not continue indefinitely
  - At each successive round, rise in NY and induced consumption become smaller and smaller
  - Why? presence of leakages (in terms of savings, taxes, import expenditure)

- Eventually all initial injection would be withdrawn when induced consumption falls to zero
- Multiplier process ends when cumulative sum of  $W = J$



## 4.2 LIMITATIONS OF MULTIPLIER EFFECT

### 1. Size of multiplier k

- MPC is very small (MPW very large): for given  $J$ , very large part of gain in  $Y$  withdrawn, very little spent on induced consumption → very little income re-injected back into economy to generate expenditure and income at subsequent rounds
- Small multiplier size dampens increase in real national income for given increase in AD
- Result – affects effectiveness of fiscal policies (covered in Macroeconomic Policies)

Example – Singapore

- Very high MPM – Singapore as an open economy imports most of its factor inputs & finished goods
- High MPS – high savings rate; presence of compulsory savings scheme (Central Provident Fund)
- High MPM and MPS → high value of marginal propensity to withdraw → small size of  $k$
- Result – any injection of government expenditure  $X$  likely lead to larger increase in national  $Y$ 
  - Certain policies (ex. expansionary fiscal policy involving gov increasing expenditure to boost AD)  $X$  very effective in achieving actual economic goals

### 2. Level of spare capacity in the economy

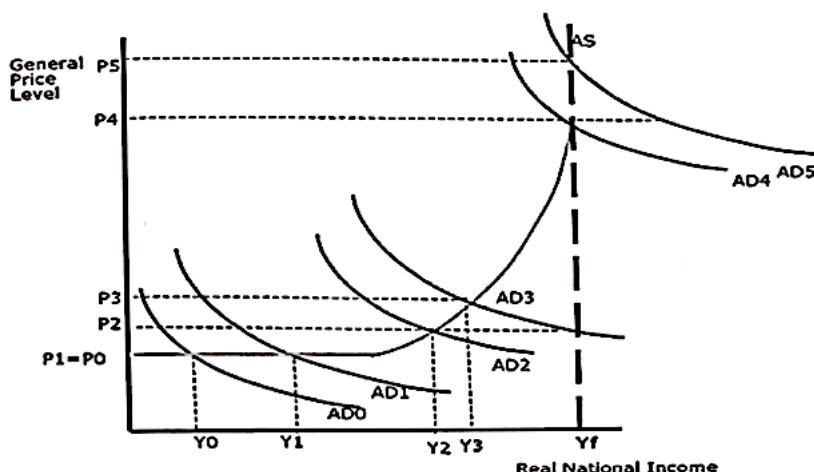


Figure 14: Impact of an Increase in AD on the Equilibrium Level of Real NY and General Price Level depending on the Level of Spare Capacity

- Economy operating with significant idle resources (ample excess capacity)
  - Each additional unit of output produced without incurring higher additional costs
  - Increase in autonomous spending, AD curve shifts right from  $AD_0$  to  $AD_1$  along horizontal part of AS curve (Keynesian Range), equilibrium level of real national income increases from  $Y_0$  to  $Y_1$  but general price level does not increase
  - Result – full effects of multiplier experienced
- Economy initially operating along upward sloping portion (intermediate) range of AS curve
  - AD curve shifts right from  $AD_2$  to  $AD_3$ , inventories fall, firms step up on production → economy gradually moves towards full capacity ( $Y_f$ ), resources become increasingly scarce

- competition for increasingly scarce resource cause additional cost of producing one more unit of output to increase → translate to higher prices of final goods → GPL increases  $P_2$  to  $P_3$
- Increase in GPL dampens effect on multiplier effect → extent of increase in real output & income dampened (real output and NY increases from  $Y_2$  to  $Y_3$  less than rise in AD)
- Why? increase in GPL reduces purchasing power of households, C falls
- Result – actual growth achieved, effects of multiplier dampened by rise in GPL
- Economy initially at full employment (at  $Y_f$ )
  - AD curve shifts right along vertical part (classical range) of AS curve from  $AD_4$  to  $AD_5$
  - Only GPL increases from  $P_4$  to  $P_5$ , no further increases in real national output/income → no actual growth → why? real output constrained at  $Y_f$  at maximum productive capacity
  - Result – any rise in AD leads to rise in GPL, while real output X able to rise

### 3. Difficulties in measurement [formular for multiplier: $k = 1/(MPM + MPS + MPT)$ ]

- Difficult to precisely measure MPM, MPS, MPT
- Why 1? economists have figures for aggregate savings of an economy/total amount of import expenditure → X same as MPS and MPM respectively
- Why 2? Lacking one or more data (either one of the MPM, MPS or MPT is often not available) → difficult to measure marginal propensity → difficult to estimate size of k

### 4. Time lags – cycles of spending & re-spending → takes time for multiplier to materialise/work

- Real world – several weeks/months required for each successive round of spending to occur → only fraction of multiplier observed quickly
- Researchers – only about half of total multiplier effect will be felt during first 6 months of  $\Delta AD$

## 4.3 REVERSE MULTIPLIER

- Fall in autonomous C, I, G, or X cause multiple leftward shifts in aggregate demand curve, lead to more than proportional fall in real national income
- Assume fall in autonomous I, more than proportionate fall in equilibrium level of real national income
  - Why? one man's loss in spending is another man's loss in income → less income leads to less spending and cycle repeats

### → Reverse multiplier process

- Fall in investment lead to fall in AD
  - Firms cut down on production + reduce demand for factors of production → receive less income → less income distributed to factors of production (ex. labour from households)
- Household income falls, decrease consumption expenditure, induced consumption on domestically produced G&S fall → result in another contraction of AD
  - Affected firms need to cut down on production & employ less factor inputs from households → another round of cutback in national income
  - Process of fall in income & induced consumption repeats over many rounds
- Process is not finite – fall in income and induced consumption become smaller with each successive round → why? fall in income leads to decrease in withdrawals (savings, taxes, imports)
  - Presence of withdrawals causes subsequent rounds of additional fall in spending and income to be fraction of previous rounds → AD curve shifts increasingly smaller at each subsequent rounds
- Process ends when cumulative fall in withdrawals equals initial fall in AD
  - Economy reaches new and lower equilibrium level of national income
  - Fall in equilibrium real national income more than proportionate to initial fall in investment

### SECTIONAL SUMMARY

- Important to know multiplier effect, multiplier principle, and multiplier process
- Change in autonomous spending will lead to more than proportionate change in national income via multiplier process
- Multiplier process ends when initial autonomous increase in AD has totally leaked out as withdrawals

- Multiplier process depends heavily on induced consumption (on domestically produced goods & services)  
→ size of multiplier depends on marginal propensity to consume MPC
- MPC refers to proportion of additional income spent on consumption of domestically produced goods and services
- Formula of multiplier is  $k = 1/(1 - MPC) = 1/MPW$  → such that the smaller the MPC (or larger the MPW), the smaller the size of the multiplier

# UNIT 5 – KEY ECONOMIC INDICATORS NOTES

## 1. INTRODUCTION TO MACROECONOMICS

### 1. INTRODUCTION

**Macroeconomics** is the study of economic performance of national economies and policies that governments use to try to improve that performance

- Concerns economic aggregates such as overall level of output, prices, and employment in economy
- Main macroeconomic aims of governments – sustained, sustainable, inclusive economic growth, price stability, full employment, favourable balance of payments position

Microeconomics	Macroeconomics
Focuses on <ul style="list-style-type: none"><li>• <u>Maximising society's welfare</u> in terms of consumer &amp; producer surplus</li><li>• <u>Efficiency &amp; equity</u></li></ul>	Focuses on <ul style="list-style-type: none"><li>• <u>Improving living standards</u></li><li>• Economic performance: achieving 4 macroeconomic aims</li></ul>
Focuses on <u>consumption</u> & <u>production</u> in <u>individual/isolated</u> markets	Focuses on <u>aggregation</u> of prices and output levels of <u>all</u> goods and services produced in <u>all</u> markets in an economy
Concerned with price and quantity/output of goods & services in given market/industry	Concerned with general price level (GPL) and Real National Income (RNY)/Total Production & Consumption of all goods & services
Decision-making by consumers, producers and governments and its effects on isolated markets	Decision-making by governments and its effects on the macroeconomy

INSERT IMAGE

## 2. ECONOMIC PERFORMANCE AND ITS INDICATORS

### 2.1 ECONOMIC GROWTH is defined as an increase in real gross domestic product

- Actual and potential growth required to achieve sustained economic growth
- **Actual growth** is the increase in national output actually produced for a given period of time, commonly measured by percentage increase in real GDP
- **Potential growth** is the increase in productive capacity of the economy for a given period of time
  - Increase in quantity or quality of resources contribute to potential economic growth
- Sustained economic growth goes towards aim of raising consumption levels
  - Why? to improve living standards of society
  - Caveat – increasing production levels may X help society achieve better living standards → result in unintended negative consequences
- Need to promote sustainability and inclusiveness of economic growth

**1. Measuring economic growth** – **GDP & GNI** requires value of total production of all goods and services in an economy; known as National Product

- Product approach – sum of value of all outputs
- Expenditure approach – sum of all expenditures
  - Include consumption C, gov. expenditure G, investment I, net exports (X – M)
- Income approach – sum of all income
  - Include wages (labour), profit (entrepreneurship), interest (capital), rent (land)

Fundamental identity of national income states that

$$\text{National Product} \equiv \text{National Income} \equiv \text{National Expenditure}$$

- National product – value of all goods and services produced in an economy
- National income – total income earned by workers in an economy
- National expenditure – total expenditure by consumers in an economy

Explanation – for a given level of economic activity

- National Product = National Expenditure
  - Value of all goods & services produced in given period of time equals to amount buyers must spend to purchase them

- National Income = National Expenditure
  - Sellers receives the amount buyers spend
  - Total income generated by economic activity + returns to factors of production (rent, wages, interest/dividend, profit) equals to sellers' receipts
- Economists ✓ use alternative methods of measuring economic growth
  - Either measure national product, national income, or national expenditure

**1. Gross Domestic Product GDP** is the value of all final goods and services produced within the geographical boundary of a country over a given period of time

- Unit of measurement – currency of country (ex. SGD, USD)
- Uses – measuring economic growth, indicating living standards, comparing between countries, reflecting the economic environment of a country

Comparing changes in GDP across time (year-on-year) and economic growth rates (%)

$$\text{Economic growth rate}_{\text{current year}} = \frac{\text{real GDP}_{\text{current year}} - \text{real GDP}_{\text{previous year}}}{\text{real GDP}_{\text{previous year}}} \times 100\%$$

OR

$$g_{Y_n} = \frac{\text{real GDP} - \text{real GDP}_{n-1}}{\text{real GDP}_{n-1}} \times 100\%$$

where  $g_y$  = growth rate and  $n$  = year

**Real GDP** is value of final goods & services produced in given year in terms of prices in a base year

- Calculate – fixed year (base year) prices multiplied by current year quantities for all goods and services produced in an economy (prices are constant) [**Real GDP =  $P_{\text{base year}} \times Q_{\text{current year}}$** ]
- Allows quantities of production to be compared across time by holding prices constant
  - Used for economic growth rate calculations to ensure values of GDP calculated are at constant prices (calculating  $\Delta$  quantity of production, constant price from year to year)

Meaning of Real GDP sign

- **Positive** growth rates → real GDP is increasing
- **Falling** growth rates → real GDP increasing at slower rate
- **Negative** growth rates → fall in real GDP
- Larger real GDP value (\$\$m), greater level of production in an economy
  - Higher economic growth rate %, faster rate of increase in level of production in an economy
- Emerging economies – tend to have lower real GDP values but high growth rates
  - Why? many resources unemployed/underemployed → low actual production levels
  - But availability of ideal resources (spare capacity) → experience rising aggregate demand → ✓ increase production quickly
- Developed economies – high production levels, further growth in production difficult
  - Why? lack of spare capacity when resources almost fully utilised

**Nominal GDP** is value of final goods & services produced in given year in terms of prices in same year

- Calculate – current year prices multiplied by current year quantities for all goods and services produced in an economy [**Nominal GDP =  $P_{\text{current year}} \times Q_{\text{current year}}$** ]
- **EXAM TECHNIQUES** – definition, indicator (formula, what it means, limitations)

**2. Gross National Income GNI** measures the value of all final output of goods and services produced by nationally owned factors of production during a given period of time, using the income approach

- Unit of measurement – currency of country
- **Domestic production** refers to production within a country's geographical boundaries regardless of origin of factors of production
- **National production** refers to production from factors of production owned by citizens of a country regardless of country in which production occurs

Example

- Foreign Multinational Companies (MNCs) in SG – contribute to GDP, not GNI
  - Ex. monetary value of final goods & services produced by Goldman Sachs/Pfizer in SG
- Singaporean firm based abroad – contribute to GNI, not GDP

- Ex. SG firm located abroad (Awfully Chocolate, United Overseas Bank)

## → Relationship between GDP and GNI

$$GNI = GDP + NFIA$$

where NFIA (net factor income from abroad) = income earned from abroad, following out of SG into foreign country

**Net factor income from abroad** NFIA represents the difference between income that locally owned residents or firms have received from abroad and the income claimed by non-residents based locally

- Helps compare GNP and GNI to indicate extent which country's national Y is derived from abroad
  - GNI less than GDP – income from country's production flows to foreign people/firms more than income flowing from domestic labour/capital based overseas; if **NFIA < 0**
- **NFIA = income earned from abroad – income following out of SG into foreign country**

## → GDP vs GNI

- GNI is a more accurate reflection of consumption levels within a country
  - Why? income earned by local factors more likely spent in domestic economy + some of income reflected in GDP are foreign owned, less likely to contribute to domestic consumption
- GDP is reported more frequently → why? better reflects economic environment of a country
  - Reflects quantity and quality of resources physically available + state of technology in country → helps investors decide on whether to invest in a country

→ **Limitations of GDP/GNI** – potentially underestimate level of national output as production of some goods & services goes unrecorded

### 1. Presence of non-market activities

- **Non-market activities** refer to production of goods & services that are not bought & sold in market
  - Involves use of society's resources for production of goods & services to meet wants, but X occur in markets → no transaction that record price of good to reflect value of production
  - Ex. same service of housework by homemakers provided by paid home-cleaner recorded as transaction in market for home-cleaning services
- Summing up receipts of expenditure/incomes of households to obtain GDP/GNI inevitably excludes value of non-market activities
- Most activities & productions are marketed in MDCs than LDCs
  - Why? people in rural villages commonly trade services with each other/cooperate on various tasks without exchanging money
  - Families tend to be relatively self-sufficient (subsistence farming)
  - Result – actual amount of goods produced + available for people to consume in developing country non-marketed → underestimated

### 2. Presence of underground economy

- **Underground economy** refers to unreported transactions, including both illegal activities (dealing of drugs) and legal activities (private home tuition)
- Increasingly difficult to assess total level of production in both formal and underground economy
  - Why? better communication technologies allow transactions to occur informally → production unrecorded
  - Why? internet revolutionised how buyers are matched with sellers → sale of product X occur in government licensed shop
- Result – transaction hidden from government record keepers → excluded in GDP

**2. Sustainable growth** refers to a rate of economic growth that can be maintained without creating other significant economic problems, such as depleted resources and environmental problems, particularly for future generations; implies positive and stable growth rate over an extended period of time

**Sustainable development** – meet needs of ppl X compromising that of ability of future generations

- Promotes consistently improving quality of life, maintains intergenerational welfare over time
- Rapid increase in production levels constituting country's economic growth may be unsustainable
  - Why? achieved rapidly through industrialisation, urbanisation, increasing exports of natural resources and/or agriculture

- Normative in nature → considers ecological, sociological, moral aspects of economic growth
  - Why? many aspects considered in assessing sustainability of growth + qualitative nature → no single indicator of sustainable growth

**Green GDP** – index of economic growth that factors in environmental consequences associated to growth to assess sustainability of their economic activity

- Adopted by countries like China and India → why? threat of unsustainable growth

**3. Inclusive growth** refers to a rate of growth sustained over a period of time, is broad-based across economic sectors, and creates productive employment opportunities for majority of country's population

- Income distribution must be considered to achieve this
  - Why? growth must not worsen income inequality (measured using **Gini Coefficient**)
- Broad-based productivity growth across many sectors of the economy to achieve inclusive growth
  - Productivity generally refers to output per unit of resource (labour productivity)
  - **Labour productivity** – amount of goods & services produced for each hour of a worker's time
- Government strategy to achieve inclusive growth → raising labour productivity

**Limitation** – hard to measure

- Why? most statisticians report amount of output per labour instead of per unit of their time

## 2.1 SECTION SUMMARY (economic growth)

- 3 main types of economic growth economists consider
  - Economic growth: actual and potential growth
  - Sustainable growth
  - Inclusive growth
- Key economic indicators related to economic growth are
  - GDP, GNI, Real GDP Growth Rates (%), Labour Productivity, Green GDP, Gini Coefficient

**2.2 PRICE STABILITY** results from a low and stable rate of inflation

- Meaning – prices increase gradually and do not fluctuate in wild and unpredictable manners
- Importance – stable prices aid process of economic decision making that facilitates economic growth and rising living standards → investor confidence + FDI

## DEFINITIONS

- **Inflation** is a situation where there is sustained increase in general price level
- **Disinflation** refers to a substantial reduction in the rate of inflation (prices rising at slower rate)
  - Government aims for disinflation when too high inflation rates
- **Deflation** is a situation in which the prices of most goods and services are falling over time so that the rate of inflation is negative

## → Measuring price stability: CPI & inflation rate

**1. Consumer price index CPI** measures price of fixed basket of goods & services commonly purchased by a typical household; it is a weighted price index

- Weighted price index – each item in basket of G&S given weight according to importance
  - Measured by goods' share in total consumption expenditure of typical household
- Types & specification & weights of G&S fixed at base year + kept unchanged
  - Why? price change in subsequent years → price of basket & CPI changes but makeup of goods remains the same → change in index reflects solely price changes over time
- Price of basket in base period assigned CPI value of 100
  - Price in other periods – shown as percentages of price in base period
  - Ex. base year is 2000, price of basket increased by 5% in 2001 → 2001 CPI = 105

**2. Inflation rate** measures change in price level from year to year; measured in percentages (%)

$$\text{inflation rate}_{\text{current year}} = \frac{\text{CPI}_{\text{current year}} - \text{CPI}_{\text{previous year}}}{\text{CPI}_{\text{previous year}}} \times 100\%$$

$$i_n = \frac{\text{CPI}_n - \text{CPI}_{n-1}}{\text{CPI}_{n-1}} \times 100\% \quad (\text{where } i = \text{inflation rate}; n = \text{year})$$

## → Limitations of CPI – substitution bias, quality adjustment bias

- Though CPI rises & price of basket rise → cost of living may not have necessarily risen
- Why?

### 1. Substitution bias – price of good rises, consumers switch to consume relatively less expensive alternatives

- Measurement of CPI X account for sub. effect → fixed basket of G&S less accurate reflection of Δ consumption patterns → result: CPI overstates increase in cost of living from one year to next
- Ex. coffee & tea in basket of G&S used for measurement of CPI: coffee price rise more than tea price rise → consumers switch to consume tea to keep cost of living low → weight given to coffee & tea X adjusted when fixed basket of G&S used to calculate inflation rate → CPI overstates increase in COL

### 2. Quality adjustment bias – price of good rises when real value increases, better quality version more ex.

- Increase in price of good captured nominally → CPI rises, imply cost of living inflated
  - Ex. better surgical methodology + increase success rate → increased price of surgical procedures → surgical procedures included in reference basket of G&S → increase in price captured nominally → CPI rise → imply cost of living inflated
- Problem – difficult to make distinction between Δ in underlying price of G&S and Δ in quality
- Solution – composition & weighting pattern for CPI basket revised every 5 years to reflect changing consumption patterns in SG

**2.3 FULL EMPLOYMENT** indicates a non-zero, low rate of unemployment that is compatible with price stability, when all those who are able and willing to work have gained employment

## → Measuring unemployment – unemployment rate, non-accelerating inflation rate of unemployment

### 1. Unemployment rate

**Unemployment of labour** refers to situation where people who are willing & able to work and are actively seeking work but cannot find jobs

$$\text{unemployment rate} = \frac{\text{No. of unemployed persons}}{\text{labour force}} \times 100\%$$

Singapore context

- **Unemployed people** refer to people aged 15 years and over who were without work but were available for work and were actively looking for a job during the survey reference period
  - Include people X working but taking steps to start their own business OR take up a new job offer after the reference period
- **Employed people** refer to people aged 15 years and over who worked for one hour or more either for pay, profit or family gains during the reference period
  - Include people who have a job/own a business, but were temporarily absent
- **Labour force/economically active population** refers to people aged 15 years and over who were either employed or unemployed during the reference period
- **Economically inactive people** refer to those unwilling and/or unable to work and were not looking for a job during the reference period
  - Full-time students, unpaid homemakers, retirees, people unable to work (disabilities)
  - X included in unemployment rate statistics → X unemployed/part of labour force

### 2. Non-accelerating inflation rate of unemployment (NAIRU) [i.e. natural rate of unemployment]

- Achieved when cyclical unemployment is zero, only structural & frictional unemployment prevails
  - Cyclical unemployment – unemployment levels fluctuate
- Refer to macroeconomics aims and issues for different types of unemployment

→ **Limitations of unemployment** – X measure utilization of labour resources → why? changes in rate could result from changing size of labour force

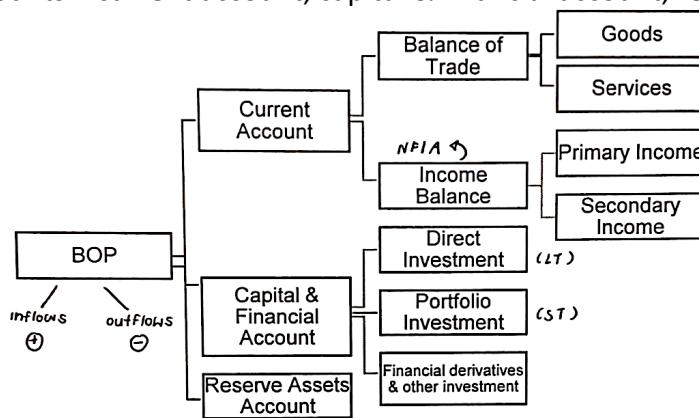
- Unemployment rates decline when unemployed people stop looking for jobs + leave labour force
  - Why? for further education & training OR to retire OR discouraged to search for jobs

- Numerator & denominator of unemployment rate falls (numerator falls by greater proportion) → fall in unemployment rate → X imply better utilisation of resources
- Unemployment rate rises when there is increase in size of labour force
  - Why? new entrants/re-entrants to labour market X immediately employed, seek jobs first
  - Numerator & denominator of unemployment rate rises (numerator rises by greater proportion) → rise in unemployment rate → X imply poorer utilisation of resources

## 2.4 FAVOURABLE POSITION OF BALANCE OF PAYMENTS

**Balance of payments BOP** is a record of a country's international transactions which involve flows of money between residents of a country and the rest of the world

- All countries are open economies; countries trade with and have financial dealings with rest of world
- Monetary inflows improve BOP position while monetary outflows worsen BOP position
  - **BOP deficit** – occurs when outflow of money is more than inflow of money
  - **BOP surplus** – occurs when inflow of money is more than outflow
- Different international transactions recorded in different accounts in BOP
  - 3 main accounts – current account, capital & financial account, reserve assets account



Overview of the Balance of Payments Structure

### 1. Current Account CA – comprises trade balance and income balance

- CA balance is the overall position of trade & income balances
  - Surplus – inflow of money exceed outflow | deficit – outflow exceeds inflow
- **Credit items** – transactions resulting in inflow of money
- **Debit items** – transactions resulting in outflow of money

→ **Trade balance** refers to value of difference between export revenue and import expenditure

#### 1. Goods balance – records exports & imports of physical goods

- Credit item → sale of exports results in an inflow of money from overseas
- Debit item → payments of imports results in an outflow of money

#### 2. Service balance – records exports & imports of services (transportation, travel, insurance)

- Credit item → inflow of money → purchase by overseas resident of SG insurance policy
- Debit item → outflow of money → purchase of foreign holiday

→ **Income balance** comprises primary income balance and secondary income balance

#### 1. Primary income balance – records wages, interest and profits flowing into & out of country

- Credit item → inflow → SG owned firm in China earning profits
- Debit item → outflow → dividends earned by foreigner from ownership of share in SG company

#### 2. Secondary income balance – government contributions to and receipts from international organisations, and international transfers of money by private individuals

- **Transfers** are transactions where the originator does not receive something in return
- Ex. monetary aid sent from SG to IMF to help vulnerable low-income countries cope with economic impact of COVID-19 pandemic → outflow of money → debit item

### 2. Capital & Financial Account KFA – records changes in ownership of assets

- Comprises direct investment, portfolio investment, financial derivatives and other investment flows

- Transactions in KA are recorded according to **asset-liability principle**

- Outflow of money – acquisition of overseas assets by locals
- Inflow of money – acquisition of local assets by foreigners

→ **Direct investment** (i.e. long term capital flows) refers to foreign direct investment FDI inflows/outflows

- FDI inflow** – occurs when a foreign company invests money from abroad in one of its branches or associated countries in SG
  - Ex. foreign firm purchase of factory in SG → inflow of money into SG → increase in foreign claim on assets located in SG, increase in liabilities to foreigners → debit item in KFA
- FDI outflow** – refers to fixed capital expenditure of Singapore companies abroad
  - Ex. SG businesses build factories overseas, purchase capital goods overseas → outflow of money → SG has increased claim on overseas assets → credit item in KFA

→ **Portfolio investment** refers to transactions involving purchase and sale of financial assets, such as equities, bonds, bank deposits & withdrawals; includes short term capital or hot money

- Short term capital** – asset held for a period of 36 months or less
- Hot money** – common between international financial centres to take advantage of differences in countries' interest rates and exchange rates
  - Flow of funds from one country to another in order to earn a short term profit on interest rate differences/anticipated exchange rate shifts
- Ex. SG resident buys shares of overseas company → outflow of money to purchase shares → increase in SG's claim on foreign assets → credit item

**3. Reserve Assets Account RAA** – records international transactions made by monetary authorities specifically for purpose of financing overall BOP position

- Official foreign reserves is the amount of foreign currencies held by the central bank
  - Increase in official foreign reserves → credit item
  - Decrease in official foreign reserves → debit item

**4. Overall BOP Position** – comprises sum of current account, capital & financial account, net errors and omissions account (X important in learning & conceptual understanding of BOP)

- BOP surplus** – net inflow of money as a result of transactions recorded in current account, capital & financial account, and net errors and omissions account
  - BOP surplus: CA – KFA + Net Errors & Omissions  $> 0 \rightarrow RAA > 0$
- BOP deficit** – net outflow of money as a result of transactions recorded in current account, capital & financial account, and net errors and omissions account
  - BOP deficit: CA – KFA + Net Errors & Omissions  $< 0 \rightarrow RAA < 0$

***CA – KFA + Net Errors & Omissions (Overall BOP Position) – RAA = 0***

**Accommodating transactions** are transactions in reserve assets account; arise from overall BOP position

- BOP surplus** – accumulation of official foreign reserves, increase in Reserve Assets Account
- BOP deficit** – financed by drawing on RAA, decrease in official foreign reserves

Below is Singapore's BOP for 2019. Interpret Singapore's BOP by answering the following questions.

- Is the current account in surplus or deficit?
- Is there net inflow or outflow of money in capital and financial account?
- Is the capital and financial account in surplus or deficit?
- Overall, is there a net inflow or outflow of money?
- Is Singapore's BOP in surplus or deficit?
- As a result, will Singapore's official foreign reserves increase or decrease?

<b>D Overall Balance (A-B+C)</b>	<b>-11,442.8</b>
<b>A Current Account Balance</b>	<b>86,131.8</b>
Goods Balance	133,678.2
Services Balance	7,862.9
Primary Income Balance	-46,843
Secondary Income Balance	-8,566.3
<b>B Capital &amp; Financial Account Balance</b>	<b>95,000.6</b>
Direct Investment	-98,468
Portfolio Investment	137,751.3
Financial Derivatives	14,104.7
Other Investment	41,612.6
<b>C Net Errors &amp; Omissions</b>	<b>-2,574</b>
<b>E Reserve Assets Accounts</b>	<b>-11,442.8</b>

Figure: Singapore's BOP for 2019, In million dollars (Singapore Department of Statistics)

### 3. LIVING STANDARDS AND ITS INDICATORS

- Goal of all economies: raise living standards (quantitative: material; qualitative: non-material)

**3.1 MATERIAL STANDARD OF LIVING (SOL)** can be indicated by quantity of goods and services consumed by the average person in a country in a given time period

→ **Real GDP per capita** – typically used to measure material SOL

- Definition: value of all final goods & services produced within the geographical boundary of a country during a given period of time

Why use real GDP? Eliminates effects of inflation through holding prices at constant (typically base year)

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{CPI}_{\text{current year}}} \times \text{CPI}_{\text{base year}}$$

- Importance – Δ price without Δ production increases GDP → X indicative of increase in production
  - Result: nominal GDP X used to compare production level over time; use real GDP
- Nominal values are monetary values measured at current prices
  - Changes in nominal GDP reflect changes in both prices and volume of output produced
- Real values are monetary values corrected to eliminate effects of inflation (base year prices)
  - Changes in real GDP reflect changes in volume of output only
  - Ex. base year (2005) = \$2/pack | today: lunch pack = \$5, nominal expenditure on 10 packs = \$50 → real expenditure on 10 packs today = \$20

Why per capita (consider population growth)? Growth in GDP attributed to increasing population **does not translate to increasing material welfare** for the average person in the economy

$$\text{Real GDP per capita}_{\text{current year}} = \frac{\text{Real GDP}_{\text{current year}}}{\text{Population size}_{\text{current year}}}$$

- Rise in real GDP per capita reflects increase in the amount of goods & services available for consumption for an average person in the economy → material living standards have risen
- Ex. real GDP of country increase by 5%, population increases by 10% → real GDP per capita decreases
  - Why? numerator rises slower than denominator → fall in SOL of average person in country

→ Limitation of using Real GDP per capita

#### 1. Income distribution

- GDP measures total quantity of goods & services produced in an economy within geographical boundary of a country → X convey information on who gets to enjoy those G&S
- Growth propagates inequality in income distribution within a country
  - Economic growth & traditional metrics used to assess it (GDP) X reliable & sufficient to guarantee inclusive growth in the global economy
- Higher the Gini coefficient, more inequitable distribution of G&S → measurement of material standard of living/material welfare of average individual becomes less reliable

Why growth propagates inequality in income distribution

- Rapid growth in certain industries/sectors of economy producing higher value-added G&S provide more opportunities for skilled/talented workers than low-skilled → widening income disparities
  - Ex. economic growth driven by exports → higher derived demand for labour in these industries (ex. banking/tourism) → increased wages of workers in export-oriented industries
- Result – use of average values (ex. real GDP per capita) is weak measure of actual amount of G&S consumed by average individual

#### 2. Composition of GDP

- GDP X account for composition of economy's output as production does not always consumption
- Why? GDP measured by expenditure method (consumption, investment, government spending, net exports) → GDP rise due to I/G/ (X - M) → rise in GDP X directly related to increase in consumers' consumption levels in current period

Why composition of GDP matters

- Rising investment occurs when more factories and plants are produced
  - X imply more G&S available for consumption, X raise consumers' material SOL currently

- Caveat – higher investments contribute to higher potential growth → higher levels of real GDP per capita → average individual able to consume more G&S in future → higher future material standard of living
- Type of government expenditure in current period determines whether it contributes to higher material standard of living
  - Improve material welfare – public goods provision (public libraries, merit goods: healthcare)
  - Unlikely to produce much tangible improvements in living standards/material wellbeing – ex. spent on defence goods (fifth-generation fighter jet)

### **3.2 NON-MATERIAL STANDARD OF LIVING** refers to qualitative aspects of life

- Broad-based measure of welfare; can be in terms of access to good quality healthcare, education, safety, freedom, little interference or tolerable & sustainable level of stress, displacement, depletion of non-renewable resources and pollution, among other aspects

→ **Real GDP per capita** – function as indirect proxy for non-material welfare

- Why? rise in average income levels → consumers enjoy more and better quality G&S → enhance non-material welfare
  - Ex. higher Y, consumer access quality healthcare & education & enjoy more leisure activities
- Limitation – possible sources of tension between GDP growth and non-material welfare
  - Real GDP growth comes at expense of longer working hours, less leisure time available for family/cultural & education pursuits → compromises non-material welfare

→ **Other welfare indicators** – used to directly measure aspects of non-material welfare (serve as proxy for same non-tangible aspects of welfare); list is not exhaustive; common aspects include:

#### **1. Healthcare** – common measures

- Indicate quality of healthcare available in the country: life expectancy rates, infant mortality rates
- Indicate quantity of healthcare available: ratio of no. of doctors, dentists, nurses to population

#### **2. Education** – measuring quantity and quality of education

- Literacy rates, mean years of schooling, highest qualification attained by population

#### **3. Pollution** – diff. countries have diff. air quality index (why? air polluted by diff. types of pollutants)

- SG: traditional pollution standard index (PSI) → haze period: PM<sub>2.5</sub> concentration used to better indicate extent of haze

#### **4. Stress levels** – proxy for stress levels: no. of hours worked per week/annually

- Limitation – longer working hours X necessarily mean greater stress levels
- Solution – job satisfaction surveys used to qualify level of stress

#### **5. Security**

- Crime rates give indication of physical safety felt by citizens of a country
- Corruption perception index indicates confidence citizens have in their governments

→ **Limitations of welfare indicators**

#### 1. Relationship between real GDP per capita & non-material welfare is unclear

- Why? real GDP per capita is positively/negatively related with certain aspects of non-material welfare

#### 2. Quantitative/welfare indicators are highly subjective → why? welfare cannot be quantified

- Collection of data is costly + may not be accurate → proxies are highly limited
- Ex. impossible to measure security & happiness; measuring no. of doctors X imply quality of healthy OR accessibility to those who need it

Conclusion – welfare indicators must be constantly reviewed & refined to isolate effect to be measured

- Solution – use various indicators to measure an aspect to provide better picture
- Ex. all indicators of healthcare suggest improvements → country likely experience better healthcare

**3.3 COMPOSITE INDICATORS** combine material and non-material measures to give more complete picture of the level of human wellbeing

- Why? Real GDP per capita & individual welfare indicators limited in ability to assess standard of living

**1. Human Development Index HDI** is the most widely used indicator and it measures average attainment of long and healthy life, knowledge and a decent material standard of living

- Indicates **human potential** (project productive capacity & labour mobility)
- Measures life expectancy at birth, mean no. of years of schooling for adults, expected years of schooling for students, PPP-adjusted real GNI per capita

**2. Measure of Economic Welfare MEW** adjusts measures of total national output (ex. GDP/GNI) by adding value of leisure & of transactions in underground economy & deducts cost of environmental damage

- Involves difficult task of assigning monetary values to non-market goods

**3. Index of Sustainable Economic Welfare (ISEW)** balances GDP with income distribution, costs related to pollution, environmental damage and resources depletion

- Developed with intention to replace GDP to measure sustainable economic growth
- Developed into Genuine Progress Indicator (increasingly accepted as measure of sustainability)

**4. OECD Your Better Life Index** – welfare based on what people perceived to be important to them

- Why OECD? better approximation, measures one's happiness & psychological wellbeing instead of relying on proxies (developed by Organisation for Economic Cooperation and Development OECD)
- Measures 11 aspects: income, employment, housing, health, social relationships, education, environment, administration of institutions, security, general satisfaction, work-life balance
  - Website allows indicator to be easily adjusted to reflect changes in relative importance of different aspects → account for different perspectives of what constitutes welfare

#### → Limitations of composite indicators

1. Subjectivity of what aspects determine overall welfare limits reliability

- Indicators take into account both material & non-material aspects of SOL → limited due to difficulties in determining weightage of each aspect
- OECD Your Better Life Index: country A ranks lowly (lack of social relationships), but residents in country X value social relationships compared to other countries → happier with more privacy

2. HDI: X account for qualitative factors & does not consider income distribution

- X account for qualitative factors: cultural identity, political freedoms (ex. human security, gender opportunities, human rights), biodiversity, gender inequality
- X account for income distribution: income unevenly distributed, human development is inequitable → subjectivity of what aspects determines overall welfare limits usefulness in measuring SOL

Note: economic growth and economic development are not the same economic concept

- Economic development considers both quantitative & qualitative aspects of life of an average citizen
- Economic growth – X necessarily translate into economic development
  - Why? economic development takes into account social and political conditions of a country → broader concept than economic growth → more inclusive in nature

## **4. COMPARISONS OF LIVING STANDARDS**

- Often made across time and across geographic regions to take stock of the progress made
- There are some limitations when doing so

### **4.1 COMPARISONS OVER TIME** – real GDP per capita used to compare material SOL of country over time

- Gross Domestic Product GDP is the value of all final goods and services produced within the geographical boundary of a country during a given period of time

#### **Why it is important to consider real GDP**

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{CPI}_{\text{current year}}} \times \text{CPI}_{\text{base year}}$$

- Nominal values are monetary values measured at current prices
  - Δ price occurring without Δ in production could increase GDP → nominal GDP reflects changes in price and volume of output produced → X used to compare production level over time
- Real values are monetary values corrected to eliminate effects of inflation using base year prices
  - Real GDP eliminate effects of inflation, reflect changes in volume of output produced only → measures actual increase in goods and services produced
  - Real GDP eliminates increases in nominal GDP merely due to price increases
  - If GDP grows over time, means that production levels are increasing
- Real GDP used to gauge standard of living over a period of time rather than nominal GDP

#### **Why it is important to consider per capita**

$$\text{Real GDP per capita}_{\text{current year}} = \frac{\text{Real GDP}_{\text{current year}}}{\text{Population size}_{\text{current year}}}$$

- Rising population is a growth factor
  - Increase in population, more labour resources available, lead to greater production
  - X eliminate effects of population growth when use GDP to assess aggregate economic performance over time
- GDP growth due to rising population X translate to increasing material welfare for average person in economy; have to use per capita values in measurement of material SOL
  - Why? production levels rise with larger rise in population, lower share of G&S available for consumption for average person
  - Ex. real GDP increase by 5%, population increase by 10%, real GDP per capita decreases (numerator rises slower than denominator) → fall in SOL of average person in country → incorrect to say that 5% economic growth resulted in greater welfare
- Therefore, must account for population changes when comparing how material welfare Δ over time

### **4.2 COMPARISONS BETWEEN COUNTRIES**

#### **→ A Differences in real GDP growth rates**

- Higher real GDP per capita growth rate X imply high level of real GDP per capita + high material SOL
- Higher real GDP growth rate suggest that real GDP is increasing at faster rate
  - Why? economy has spare capacity (resources relatively unemployed/underutilised, include labour, land and other natural resources) → country v expand production at faster rate compared to economy with lower real GDP growth rate (likely operating close to full capacity)
- Ex. Bangladesh growing at 7.1% year-on-year (lower real GDP value, higher real GDP growth rates)
  - Germany (developed economy) growing at 1.9% year-on-year
  - German more likely enjoys higher material & non-material standard of living by proxy compared to Bangladeshi due to higher real GDP per capita in levels

#### **→ B Standardising currency used & PPP adjustments (PPP – purchasing power parity)**

##### **Standardising currency used**

- GDP of countries converted to common currency (USD) for comparison across countries

##### **Limitations/problems arising from using PPP adjusted GDP**

- Exchange rates can be volatile from month to month and from year to year
  - Ex. large depreciation in value of Argentinean peso against US dollar might imply that Argentinean living standards have fallen though economy might be growing quickly

- Exchange rates more relevant to products traded between countries than non-traded products
  - Why? international competition reduces differentials in price for similar products → traded goods tend to sell for similar prices in most parts of the world
  - Non-traded services (domestic cleaners, hairstylists, academic tutors) tend to have bigger differences in prices across countries

#### Why purchasing power parity exchange rates should be used instead

- Market exchange rates influenced by forces of SS and DD in foreign exchange market → changes in SS & DD cause appreciation/depreciation → changes in exchange rates due to changes in exchange rate market X accurate in demonstrating purchasing power of people's income in different countries

**Purchasing power parity PPP** is a theory of exchange rates whereby a unit of any given currency should be able to buy the same quantity of goods in all countries

- Accounts for prevailing exchange rate (nominal exchange rate) → adjust for diff. in cost of living
  - Ex. price of hamburger: London = £ 2, New York = \$4 → PPP exchange rate of £ 1 to \$2 → £ 2 exchanged to \$4 → allows for same hamburger to be bought in US
- PPP exchange rate different from market exchange rate prevailing in foreign exchange market
  - Ex. market exchange rate: £ 1 to \$1.50 → person with £ 2 only can exchange for \$3 → X able to afford same hamburger in the US
- 'Big Mac' Index – cross country comparison forms the basis of 'Big Mac' Index
  - Published by Economist magazine, calculates PPP exchange rates based on McDonald's sandwich that sells in nearly identical form in many countries around the world

#### **Reason for using PPP-adjusted exchange rates to convert GDP figures**

- Must account for differences in cost of living when comparing material welfare between countries
- Welfare measurements concerning purchasing power of incomes made by individual requires use of PPP-adjustment to eliminate differences in cost of living between countries
  - Result – PPP-adjusted real GDP per capita used, differences in material standard of living between developed and developing economies less stark since cost of living in developing countries much lower
- Ex. real GDP per capita of Switzerland is higher than SG → average individual in Switzerland earn higher income but X necessarily have better SOL than average individual in SG
  - Why? cost of living higher in Switzerland, X able to afford as many things despite higher Y

#### → C Accounting for differences in population – when making comparisons over space

- Country with a smaller population has lower production levels → X mean enjoy less material welfare → similar to why we take population changes into account when making comparisons over time

#### → D Limitations of PPP-adjusted real GDP per capita

##### 1. Difficulties in determining basket of goods

- Limited use of PPP-adjusted real GDP per capita in making comparisons about material welfare across space → why? way it is derived
  - Derivation: compare prices of same basket of G&S in 2 different countries, use ratio of prices as exchange rate
- **Problem 1:** two countries X produce exact basket, affects accuracy of comparisons
  - Ex. 1 SGD in SG can pay for bus ride in SG/Malaysia → quality of bus ride in SG and Malaysia different → X say that 1 SGD brings consumers same level of welfare regardless of country → parity in purchasing power is largely a theoretical ideal
- **Problem 2:** difficult to determine composition of the basket
  - Why? consumption patterns differ across countries → basket reflects consumption patterns of consumers

##### 2. Difference in consumption patterns based on context of countries

- Goods consumed in any two countries X identical due to contextual differences in climate

- Ex. temperate countries (Germany): consumers spend more on woollen clothing & heating during winters VS tropical countries: consumers spend less on cheaper linen and cotton clothing, X experience winters
  - Germany's greater expenditure reflected in higher GDP → X imply that individuals in Germany better off compared to individuals in tropical countries
- Result – impossible to adjust national income figures for these sort of differences

### 3. Differences in accounting procedures – no internationally agreed method of measuring national income → not every country uses same basis for their figures

- Varying accuracy in data collection
  - Not the same variables are measured from country to country
  - Same variables measured to different degrees of accuracy
  - Result – data collection & accuracy limit efficacy of national income statistics (inflation, unemployment, economic growth) → limits assessment of SOL of a country
- Ex. developed country: less severe problem of data collection
  - Why? availability of better technology/survey to capture and transform statistics → increasing accuracy + reliability of national income statistics
- Ex. developing country: data collection prove to be rather arduous
  - Why 1? available data underestimate/overestimate material SOL depending on economy
  - Why 2? government manipulate data to highlight economic performance under administration to gain international reputation + win votes in future elections

### 4. Omission of non-market transactions

- Countries are various stages of development have different needs → may not be captured in GDP
- Developing nations – large proportion of economic activity takes place outside market
  - Why? lack of effective mechanism to capture transactions across the country
  - Result: larger share of total production takes place at home (food preparation, tailoring own clothing, handicrafts) → productive labour services not marketed → excluded from calculation of GDP figures → GDP figures tend to be inaccurate/underestimated compared to that of developed nations → material SOL underestimated, higher than reflected by GDP per capita values
  - Developed nations – virtually every activity has been commercialised

## SECTION SUMMARY (standard of living)

Standard of living comprises of both material and non-material standard of living

- **Material standard of living** refers to quantity of goods and services consumed by an average person in an economy, and can be measured using real GDP per capita
- Use of real GDP per capita limited due to its failure to account for income inequality & other aspects (composition of GDP)
- **Non-material standard of living** refers to qualitative aspects of welfare
  - Real GDP per capita is not a good measure of non-material standard of living
  - Other indicators that can proxy welfare are used (include life expectancy, literacy rates, air quality index)
- **Composite indicators** such as HDI allow standard of living to be measured more holistically and comprehensively and are good supplements to national income statistics
- When making comparisons over time, it is important to use real values of GDP to eliminate effects of inflation
- When making comparisons regarding welfare between countries, GDP should be adjusted with PPP-adjusted exchange rate in order to account for differences in cost of living

## UNIT 2 – PRICE MECHANISM II NOTES

### Lesson objectives

- Define concepts of price elasticity of demand/supply (PED/PES), cross elasticity of demand (CED) and income elasticity of demand (YED)
- Explain determinants of PED, PES, CED, YED
- Analyse the extent of changes in price and quantity in response to shifts in demand/supply, using PES/PED
- Analyse change in revenue in response to changes in price using PED analyse direction and extent of shift in demand in response to changes in price of related goods/income, using CED/YED respectively
- Explain relevance of PED, CED and YED to a firm's decision-making

### 1. ELASTICITIES AND ITS APPLICATION

**Elasticity** is a measure of responsiveness of a variable to a change in one of its determinants, *ceteris paribus*

- Elastic – describe a high level of responsiveness, determinant has strong influence on variable
- Inelastic – variable is not easily influenced by changes in determinant

**PRICE ELASTICITY** measures responsiveness of variable to change in price determinant, *ceteris paribus*

- Price is a determinant in demand and supply, hence, PED and PES are price elasticity measures

**1.1 PRICE ELASTICITY OF DEMAND (PED)** is a measure of the responsiveness of the quantity demanded of a good to a change in its price, *ceteris paribus*

$$PED = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price of good itself}}$$

#### 1.1.1 Interpretation of PED

→ Sign – coefficient of PED is normally negative due to inverse relationship between price & QD

- Law of Demand – increase in price (positive change in denominator), fall in quantity demanded (negative change in numerator) → PED will be a negative value
- Presentation – dropped with only absolute values presented by convention

→ Magnitude – absolute PED values range between 0 to infinity, indicates sensitivity of consumers to  $\Delta p$

- Larger magnitude of coefficient, greater sensitivity of consumers to price changes
- Price inelastic demand –  $0 < |PED| < 1$ 
  - Consumers less sensitive to price changes; QD is less responsive to changes in price, *ceteris paribus*; change in price lead to less than proportionate change in QD, *ceteris paribus*
- Price elastic demand –  $1 < |PED| < \infty$ 
  - Change in price leads to more than proportionate change in QD, *ceteris paribus*

Coefficient	Interpretation	Diagram
$ PED  < 1$	<b>Price inelastic demand</b> <ul style="list-style-type: none"> <li>• Fall (rise) in price from <math>P_0</math> to <math>P_1</math> leads to <u>less than proportionate</u> increase (decrease) in quantity demanded from <math>Q_0</math> to <math>Q_1</math>, <i>ceteris paribus</i></li> <li>• E.g. <math>PED = 0.5</math>, 1% decrease in price, 0.5% increase in QD</li> </ul>	

$ PED  > 1$	<p><b>Price elastic demand</b></p> <ul style="list-style-type: none"> <li>Fall (rise) in price from <math>P_0</math> to <math>P_1</math> leads to <u>more than proportionate</u> increase (decrease) in quantity demanded from <math>Q_0</math> to <math>Q_1</math>, ceteris paribus</li> <li><math>PED = 3</math>, 1% decrease in price, 3% increase in QD</li> </ul>	
$ PED  = 1$	<p><b>Unitary (unit) price elastic demand</b></p> <ul style="list-style-type: none"> <li>Fall (rise) in price from <math>P_0</math> to <math>P_1</math> leads to proportionate increase (decrease) in QD from <math>Q_0</math> to <math>Q_1</math>, ceteris paribus</li> <li>Demand curve would be a hyperbola</li> <li>E.g. <math>PED = 1</math>, 1% decrease in price, 1% increase in QD</li> </ul>	
$ PED  = 0$	<p><b>Perfectly price inelastic demand</b></p> <ul style="list-style-type: none"> <li>Price changes have no effect on QD, remains fixed at <math>Q_0</math></li> <li>Occurs when consumers are willing and able to pay any price for a given quantity of good</li> <li>E.g. <math>PED = 0</math>, 1% decrease in price, 0% increase in QD</li> </ul>	
$ PED  = \infty$	<p><b>Perfectly price elastic demand</b></p> <ul style="list-style-type: none"> <li>Price changes have huge effects on QD</li> <li>At exactly <math>P_0</math>, consumers will buy any quantity of good</li> <li>Any fall in price will lead to infinite increase in QD</li> <li>Any rise in price will cause QD to fall to 0</li> </ul>	

- Straight line/linear demand curve has different elasticity at each point (refer to Appendix 1)

### 1.1.2 Determinants of PED [HITS] – PED varies from one good to another

- Why? Consumers of different goods have different sensitivity to price change

#### 1. Habituality of consumption

- Good bought habitually – demand tends to be price inelastic
  - QD X very responsive to change in price, consumers continue to buy a similar amount of good regardless of price changes, less than proportionate decrease in QD
  - Example – PED for rice in Asian societies is relatively price inelastic compared to Western countries as rice is a staple food in Asian societies
- Special case of habitual consumption – consumers' addiction a particular good
  - Greater degree of addiction to substance (alcohol, drugs), more price inelastic demand
  - Price increase X cause significant reduction in QD if one is severely addicted, ceteris paribus

#### 2. Proportion of income spent on good – higher proportion of income spent on good, more price elastic

- Higher proportion of Y spent on good, more people forced to reduce consumption when p increases, demand is more price elastic, more than proportionate decrease in QD demanded
  - Why? small increases in price take up more of consumer's available income
- Example of price elastic demand – demand for cars

- Price of car constitutes significant proportion of household income, given % increase in price of car will significantly affect household's ability and decision to purchase a car
- Price of car = \$100 000, 10% rise in price, \$10 000 hefty extra expenditure
- Example of price inelastic demand – demand for sugar, candles, salt
  - Above goods take up only a very small percentage of income of most households
  - Packet of salt = \$2, same 10% rise in price has much less impact on household decision to buy

### 3. Time horizon – longer time period, consumers more likely to switch to subs., demand more price elastic

- Why? Price of good rises, consumers take time to respond to price change, adjust their consumption pattern and find alternatives → time required to develop or discover substitutes
- Example – increase in price of heating oil, ceteris paribus
  - Short time period: demand is price inelastic; consumers do little to switch to other forms of heating in short period of time
  - Longer time period: demand is more price elastic; consumers are able to switch to other heating systems (gas/install better insulation)

### 4. Number and closeness of substitutes available – large no. of close substitutes, demand more price elastic

- One of the most important determinants of PED
- Large no. of close substitutes, price of good rises, consumers more likely to consider alternatives and readily switch to other substitutes, cause more than proportionate fall in QD
- Availability of substitutes is dependent on the way market is defined
  - Narrowly defined markets – more price elastic demand
    - Easier to find close substitutes for narrowly defined goods
  - Example – apple vs fruits (broader definition)
    - Many different types of fruits that can substitute apples, demand more price elastic
    - X many different types of good that can substitute fruits, demand more price inelastic

### 1.1.3 Application of PED – most relevant when price changes (typically due to supply changes) in a perfectly competitive market

#### → Applying PED to explain changes in price and quantity of goods

- When supply changes, extent price and quantity changes depend on PED
- Increase in supply from  $S_0$  to  $S_1$ , price falls and quantity rises
  - If price is inelastic: decrease in p to  $P_1$  will be greater; increase in Q will be smaller

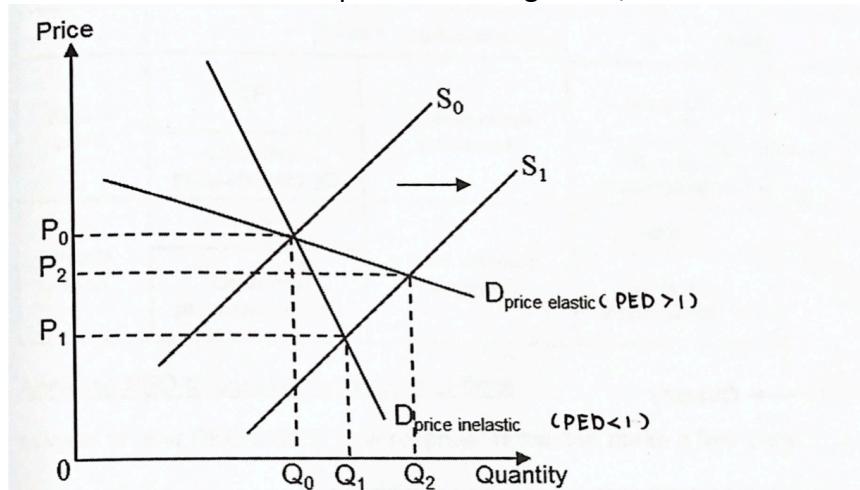
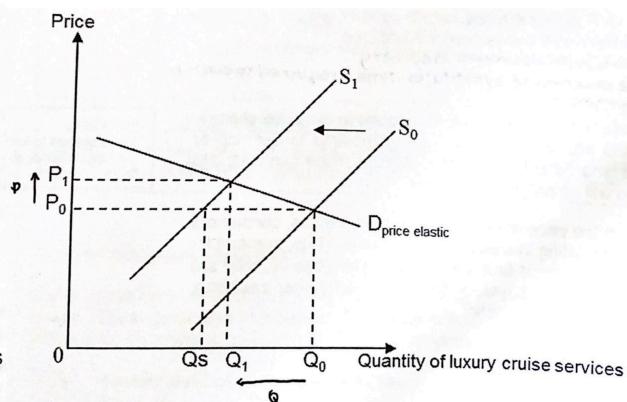
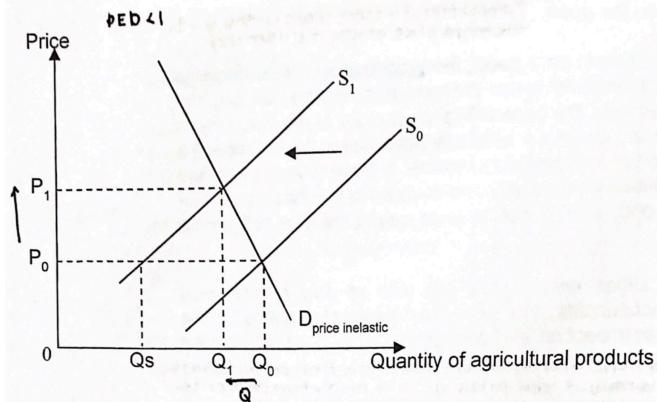


Figure 3: Comparing the effect of rise in supply between  $PED < 1$  and  $PED > 1$

		$ PED  < 1$	$ PED  > 1$
Increase in supply	Price decrease	Large decrease in price	Small decrease in price
	Quantity increase	Less than proportionate increase in Q	More than proportionate increase in Q
Decrease in supply	Price increase	Large increase in price	Small increase in price
	Quantity decrease	Less than proportionate decrease in Q	More than proportionate decrease in Q

## Example – agricultural products vs luxury products

### Answering techniques



### Agricultural products – demand is price inelastic

- Supply falls from  $S_0$  to  $S_1$  due to drought, causes a shortage of agricultural products
- Demand is price inelastic – agriculture has few substitutes and is habitually consumed for food
  - $QD \propto$  change easily, higher price needed to eliminate persistent shortage, price rises to  $P_1$
- Since  $|PED| < 1$ , rise in price cause a less than proportionate fall in QD from  $Q_0$  to  $Q_1$ , final equilibrium quantity at  $Q_s$

### Luxury cruise services – demand is price elastic

- Supply falls from  $S_0$  to  $S_1$ , causes shortage of luxury cruise services
- Demand is price elastic – X habitually consumed, relatively larger proportion of consumers' Ys
  - Shortage created is more readily eliminated as consumers are more responsive to changes in price, price X rise by much to reduce QD
- Since  $|PED| > 1$ , rise in price of  $P_0$  to  $P_1$  causes a more than proportionate fall in QD from  $Q_0$  to  $Q_1$

→ Applying PED to explain changes in total revenue/total expenditure

$$\text{Total revenue (total expenditure)} = \text{price per unit} \times \text{no. of units sold} = P \times Q$$

- PED is relevant for examining impact of changes in price on total revenue earned by firms (equivalent to total expenditure of consumers)

#### How PED is relevant/useful in explaining total revenue

- Law of Demand – quantity demanded always decreases when price rises and vice versa
- Determining impact of total revenue – drawing a comparison between extent to which QD decreases/increases and extent to which price rises/falls

$ PED  < 1$ (price inelastic)	$ PED  > 1$ (price elastic)
<ul style="list-style-type: none"> <li>Demand is price inelastic, rise in price from <math>P_0</math> to <math>P_1</math> (fall in supply) leads to less than proportionate decrease in QD from <math>Q_0</math> to <math>Q_1</math></li> <li>Gain in revenue due to rise in price (Area <math>P_0P_1ab</math>) more than loss in revenue due to decrease in QD (Area <math>Q_0Q_1bc</math>)</li> <li>Final revenue (Area <math>OP_1aQ_1</math>) greater than initial revenue (Area <math>OP_0cQ_0</math>)</li> <li>Thus, when demand for firm's product is price inelastic, rise in price leads to an increase in total revenue</li> </ul>	<ul style="list-style-type: none"> <li>Demand is price elastic, rise in price (fall in supply) leads to more than proportionate decrease in QD from <math>Q_0</math> to <math>Q_1</math></li> <li>Gain in revenue due to rise in price (Area <math>P_0P_1ab</math>) less than loss in revenue due to decrease in QD (Area <math>Q_0Q_1bc</math>)</li> <li>Final revenue (Area <math>OP_1aQ_1</math>) smaller than initial revenue (Area <math>OP_0cQ_0</math>)</li> <li>Thus, when demand for firm's product is price elastic, rise in price leads to an overall fall in total revenue</li> </ul>
<p>Figure 4: Examining how a rise in price affects total revenue when <math>PED &lt; 1</math></p>	<p>Figure 5: Examining how a fall in price affects total revenue when <math>PED &gt; 1</math></p>

#### Summary of how differences in PED affect impact of changes in price on total revenue

	$ PED  < 1$ (price inelastic)		$ PED  > 1$ (price elastic)	
Rise in price	Price increases	Total revenue increases	Small price increase	Total revenue decreases
	Less than proportionate decrease in QD		More than proportionate decrease in QD	
Fall in price	Price decreases	Total revenue decreases	Small price decrease	Total revenue increases
	Less than proportionate increase in QD		More than proportionate increase in QD	

## → Applying PED to explain the behaviours of firms

### 1. Pricing of goods

- Price inelastic demand – raise prices; price elastic demand – lower prices
- Help firms increase their revenue, effects on profits ( $\text{Profits} = \text{Total Revenue} - \text{Total Cost}$ ) is uncertain
- Why uncertain? As Q increases, TC rises.
  - If rise in TR > rise in TC, overall profits will increase
  - If rise in TR < rise in TC, overall profits will fall

#### Relation to PED

- Goods whose  $\text{PED} < 1$ , possible for profits to rise. Why?
  - Rise in total revenue (increase in price) is greater than fall in total revenue (fall in QD), lead to an overall rise in total revenue
  - Total cost likely to fall due to a fall in quantity, mean profits likely to rise
- Goods whose  $\text{PED} > 1$ , profits more likely will increase with fall in price. Why?
  - Loss in total revenue (fall in price) is smaller than rise in total revenue (increasing QD), lead to an overall rise in total revenue
  - Total cost likely to rise with an increase in quantity → if rise in TR less than rise in TC, overall profits likely to fall
  - Thus, uncommon for firms to lower prices as a means to raise profits

### 2. Focus on business strategies to make demand of products more price inelastic in the long run

- Short run – tends to be a lack of close substitutes to a firm's product
- Long run – competitors have time to replicate and produce products deemed as close substitutes

Example – Nike releases a new model of shoes into the market

- Short run – tend to have little or no close substitutes to the model
- Long run – competitors (Adidas) have time to produce similar products, demand for Nike's new sports shoe will be relatively more elastic, Nike has to reduce prices to increase revenue

### 3. Other business strategies (*advertisement, research & development*)

- Reason – to keep prices high, need to engage in business strategies to reduce substitutability of products to keep demand price inelastic in the long run
  - Allow them to raise prices, leading to less than proportionate decrease in QD, TR rises
- Example – to reduce substitutability: firms advertise to create perceived difference in products, reduce substitutability and invest in research & development improves quality of product

**1.2 PRICE ELASTICITY OF SUPPLY (PES)** is a measure of responsiveness of the quantity supplied of a good to a change in its price, ceteris paribus

$$PES = \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price of good itself}}$$

### 1.2.1 Interpretation of PES

Sign – coefficient is normally positive due to direct relationship between price and quantity supplied

- Law of Supply – increase in price (positive change in denominator), rise in quantity supplied (positive change in numerator)

Magnitude – magnitude of absolute PES value ranges between 0 to infinity

- Indicates sensitivity of producers to price changes
- Larger magnitude of coefficient, greater the sensitivity of producers to price changes
- Price inelastic –  $0 < PES < 1$ 
  - Producers are less sensitive to price changes, QS is less responsive to changes in price, ceteris paribus, change in price lead to less than proportionate change in QS, ceteris paribus
- Price elastic –  $PES > 1$ 
  - Change in price lead to more than proportionate change in QS

Coefficient	Interpretation	Diagram
$ PES  < 1$	<p><b>Price inelastic supply</b></p> <ul style="list-style-type: none"> <li>• Rise (fall) in price from <math>P_0</math> to <math>P_1</math> leads to <u>less than proportionate increase (decrease)</u> in QS from <math>Q_0</math> to <math>Q_1</math>, ceteris paribus</li> <li>• Example – <math>PES = 0.5</math>, 1% increase in price, 0.5% increase in QS</li> <li>• All straight-line curves passing through positive x-axis show price inelastic supply</li> </ul>	
$ PES  > 1$	<p><b>Price elastic supply</b></p> <ul style="list-style-type: none"> <li>• Rise (fall) in price from <math>P_0</math> to <math>P_1</math> leads to <u>more than proportionate increase (decrease)</u> in QS from <math>Q_0</math> to <math>Q_1</math>, ceteris paribus</li> <li>• Example – <math>PES = 3</math>, 1% increase in price, 3% increase in QS</li> <li>• All straight-line curves passing through positive y-axis show price elastic supply</li> </ul>	
$ PES  = 1$	<p><b>Unitary (unit) price elastic supply</b></p> <ul style="list-style-type: none"> <li>• Rise (fall) in price from <math>P_0</math> to <math>P_1</math> will lead to a <u>proportionate increase (decrease)</u> in QS from <math>Q_0</math> to <math>Q_1</math>, ceteris paribus</li> <li>• Example – <math>PES = 1</math>, 1% increase in price, 1% increase in QS</li> <li>• All straight-line supply curves from origin show unitary price elastic supply</li> </ul>	
$ PES  = 0$	<p><b>Perfectly price inelastic supply</b></p> <ul style="list-style-type: none"> <li>• Price changes have no effect on QS, remains fixed at <math>Q_0</math></li> <li>• Since <math>PES = 0</math>, 1% increase in price, 0% increase in QS</li> <li>• Occurs when producers are willing and able to sell only a given quantity of good regardless of price offered</li> </ul>	

$ PES  = \infty$	<p><b>Perfectly price elastic supply</b></p> <ul style="list-style-type: none"> <li>• Price changes have huge effects on QS</li> <li>• At exactly <math>P_0</math>, producers produce any quantity of good</li> <li>• Any rise in price leads to an infinite increase in QS, any fall in price causes QS to fall to 0</li> </ul>	
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### 1.2.2 Determinants of PES

- PES varies since producers of different goods have different sensitivity to price changes

#### 1. Level of stocks/inventories – affects how readily producers respond to price changes

- When price rises, producers incentivised to increase QS of their products
- Firms with high level of stocks – supply is price elastic
  - Able to respond quickly by drawing down on their stocks to offer their products for sale, QS responsive to price changes
- Availability of stocks depends on ease of storing stocks – non-perishables + easily stored, inelastic

**Example** – price increase of perishable food items (vegetables) vs processed products (canned food)

- Perishables X easy to store, processed products have longer shelf-life + easier to keep as stock
- If price of canned food increases, firms can increase QS readily by drawing out these stocks
- If price of perishables increases, firms X have stocks + need long time to produce food

#### 2. Availability of spare capacity – greater availability of factors of production + spare capacity, more elastic

- Supply is price elastic – firms hold sufficient stock of raw materials + have physical spare capacity (factories/equipment idle), production can be increased readily in response to price increases
- Supply is price inelastic – firms' capacity is saturated, more difficult to increase production in response to price rise

#### 3. Mobility of factors of production – refers to ease and speed at which factors of production can move from one industry to another

- More easily and quickly resources can be shifted from one industry to another, greater responsiveness of QS to changes in price, higher value of PES

**Example** – printing machine

- Easily switch from printing newspapers to magazines, firms can readily channel more FOP from one market to another market in response to changes in price, supply of newspapers and magazines would be more price elastic

#### 4. Time horizon

- Price of good changes, producers take time to respond and adjust their production pattern
- Time required for firms to increase/decrease QS; longer time period, more price elastic market supply

**Momentary period** – supply is perfectly price inelastic

- Impossible for firms to change output immediately in response to changes in price as all FOP are fixed
- Supply restricted to quantities available in the market at that point in time
- Example – rise in price due to sudden surge in demand for fish will hardly influence QS of fish supplied that day → fishmonger X able increase amount available for sale on the spot

**Short run** (period where production is restricted by at least one FOP) – supply is relatively price inelastic

- QS can be increased to some extent in response to an increase in price – some inputs can be varied, others remain fixed
- Example – producer of manufactured goods increases QS by placing orders for more raw materials + getting workers to work overtime → limit to increase in QS because producer is X able to expand no. of industrial machines or increase size of factory floor space at that point in time

**Long run** (period where all FOPs are variable) – supply becomes highly price elastic

- All FOPs are variable as there is sufficient time for firms to acquire inputs to expand production and for firms to enter the industry → QS becomes more responsive

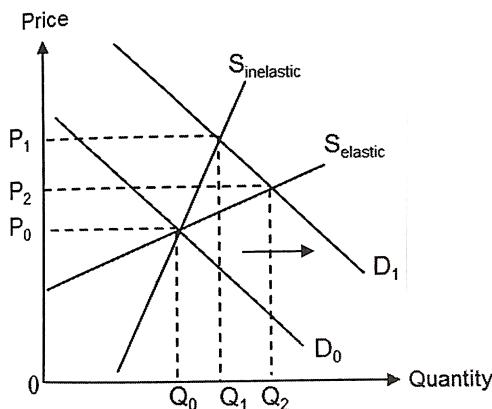
#### 5. Length of production – time taken to produce goods/services and processes involved in production affect speed at which producers respond to price changes

- Longer production period, the more time producers take to respond to price changes by altering QS
- Example – supply is price elastic: most manufactured goods, supply is price inelastic: agriculture, housing and property
  - Manufactured consumer goods – produced in factories in a comparatively shorter time period
  - Agricultural goods – long time required to increase output in response to rise in prices of goods due to long gestation periods of crops → supply is fairly price inelastic
  - Housing & Property –  $PES < 1$ : takes a long time (years) to complete a single building project, rise in price leads to less than proportionate increase in QS

### 1.2.3 Applications of PES

- Concept of PES most relevant when price changes result from changes in demand in a perfectly competitive market

→ Applying PES to explain changes in price and quantity



		$ PES  < 1$ (price inelastic)	$ PES  > 1$ (price elastic)
Increase in demand	Price increase	Large increase in price	Small increase in price
	Quantity increase	Less than proportionate increase in QS	More than proportionate increase in QS
Decrease in demand	Price decrease	Large decrease in price	Small decrease in price
	Quantity decrease	Less than proportionate decrease in QS	More than proportionate decrease in QS

- When demand changes, extent to which price and quantity changes depends on PES
- Given increase in demand from  $D_0$  to  $D_1$ , both price and quantity will rise
- Supply is price inelastic – increase in price to  $P_1$  will be greater, increase in quantity to  $Q_1$  smaller
- Supply is price elastic – increase in price to  $P_1$  will be smaller, increase in quantity to  $Q_1$  greater

#### Answering techniques

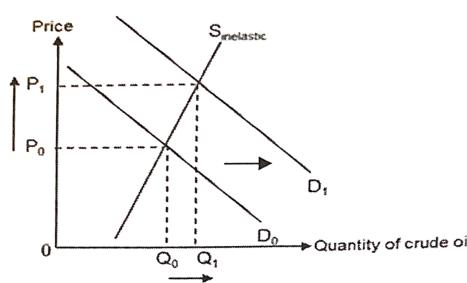


Figure 6: Market for crude oil

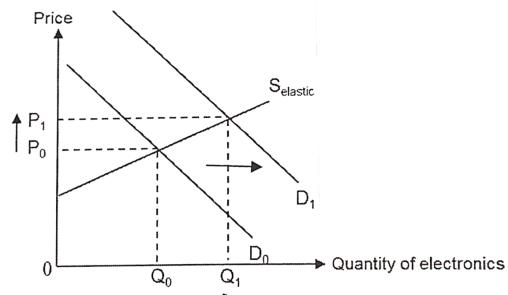


Figure 7: Market for electronics

#### Market for crude oil – supply is price inelastic

- Demand for crude oil (a primary commodity) rises due to rising population with greater energy needs, demand rises from  $D_0$  to  $D_1$ , rise in demand creates a shortage of oil
- Supply of crude oil is price inelastic, quantity supplied X change easily – why?
  - Long production time (time required to mine), limited spare capacity (oil source depleted)
- As QS does not rise easily, a much higher price is needed in order to eliminate the persistent shortage, price rises to  $P_1$
- Since  $|PES| < 1$ , rise in price from  $P_0$  to  $P_1$  causes a less than proportionate rise in QS from  $Q_0$  to  $Q_1$

**Market for electronic** – supply is price elastic

- Demand for electronics rises from  $D_0$  to  $D_1$ , shortage created
- Supply of electronics is price elastic – easily produced and stocked up as inventory
- However, shortage created is more readily eliminated as producers can easily increase QS in response, price does not have to rise by much in order to eliminate shortage, price rises to  $P_1$
- Since  $|PES| > 1$ , rise in price from  $P_0$  to  $P_1$  causes more than proportionate rise in QS from  $Q_0$  to  $Q_1$

**1.3 CROSS ELASTICITY OF DEMAND (CED)** is a measure of responsiveness of the quantity demanded of a good to a change in the price of another good, ceteris paribus

$$CED = \frac{\% \text{ change in quantity demanded of good } A}{\% \text{ change in price of good } B}$$

### 1.3.1 Interpretation of CED

- Substitutes – delivers/serves similar functions/utility
- Complements – fulfils the same need together

Sign – coefficient of CED between two goods may be positive or negative, depending on how they are related

- Sign indicates the relationship between goods → important, X ignored (unlike price elasticities)
- CED can be 0 if two goods are not related at all

#### CED is positive ( $CED > 0$ ) – two goods are substitutes

- Rise in price of a substitute causes an increase in demand for good
- Increase in price of good B, decrease in QD of good B, lead to an increase in demand for good A
- Example – Pepsi substitutes Coca-cola
  - Price of Coca-cola increases, QD falls
  - Demand for Pepsi increases as consumers switch from Coca-cola to Pepsi

#### CED is negative ( $CED < 0$ ) – two goods are complements

- Rise in price of a complement causes a decrease in demand for the good
- Increase in price of good B, decrease in QD of good B, fall in demand for good A
- Example – tennis balls complement tennis rackets
  - Price of tennis rackets increase, QD for tennis rackets falls
  - Demand for tennis balls decreases as consumers buy less of both tennis rackets and balls

#### CED is zero ( $CED = 0$ ) – two goods are unrelated

- Increase in price of good B has no effect on the demand for good A

Magnitude – indicates strength of relationship between two goods (substitutes or complements)

- The closer the substitutes/complements, the greater the magnitude will be

Coefficient	Interpretation	Diagram
CED is negative ( $CED < 0$ ) & $ CED $ is large	<b>Strong (close) complements</b> <ul style="list-style-type: none"> <li>• CED is negative and large</li> <li>• Good A has a negative CED with respect to price of good B, consumers of A are <u>very sensitive</u> to changes in price of B</li> <li>• Rise (fall) in price of B from <math>P_0</math> to <math>P_1</math> will lead to a more than proportionate decrease (increase) in demand for A from <math>D_2</math> to <math>D_3</math> ceteris paribus</li> <li>• Large leftward shift in demand curve for A</li> </ul>	<p>The top graph illustrates the market for Good B. It shows a downward-sloping demand curve <math>D_0</math> and two upward-sloping supply curves, <math>S_0</math> and <math>S_1</math>. An increase in price from <math>P_0</math> to <math>P_1</math> leads to a decrease in quantity demanded from <math>Q_0</math> to <math>Q_1</math>. The bottom graph illustrates the market for Good A. It shows a downward-sloping demand curve <math>D_2</math> and a supply curve <math>S_2</math>. A decrease in price from <math>P_2</math> to <math>P_3</math> leads to a decrease in quantity supplied from <math>Q_2</math> to <math>Q_3</math>.</p>

<p>CED is negative (<math>CED &lt; 0</math>) &amp; <math> CED </math> is small</p>	<p><b>Weak (X close) complements</b></p> <ul style="list-style-type: none"> <li>• CED is negative and small</li> <li>• Good A has a negative CED with respect to price of good B, consumers of A are not sensitive to changes in price of B</li> <li>• Rise (fall) in price of B from <math>P_0</math> to <math>P_1</math> will lead to a less than proportionate decrease (increase) in demand for A from <math>D_2</math> to <math>D_3</math>, ceteris paribus</li> <li>• Small leftward shift in demand curve for A</li> </ul>	
<p>CED is positive (<math>CED &gt; 0</math>) &amp; <math> CED </math> is large</p>	<p><b>Strong (close) substitutes</b></p> <ul style="list-style-type: none"> <li>• CED is positive and large</li> <li>• Good A has a positive CED with respect to price of B, consumers of A very sensitive to changes in price of B</li> <li>• Rise (fall) in price of B from <math>P_0</math> to <math>P_1</math>, will lead to more than proportionate increase (decrease) in demand for A from <math>D_2</math> to <math>D_3</math>, ceteris paribus</li> <li>• Large rightward shift in demand curve for A</li> </ul>	
<p>CED is positive (<math>CED &gt; 0</math>) &amp; <math> CED </math> is small</p>	<p><b>Weak (X close) substitutes</b></p> <ul style="list-style-type: none"> <li>• CED is positive and small</li> <li>• Good A has a positive CED with respect to price of B, consumers of A not sensitive to changes in price of B</li> <li>• Rise (fall) in price of B from <math>P_0</math> to <math>P_1</math>, will lead to less than proportionate increase (decrease) in demand for A from <math>D_2</math> to <math>D_3</math>, ceteris paribus</li> <li>• Small rightward shift in demand curve for A</li> </ul>	

### 1.3.2 Determinants of CED between two goods are (covered in 1.3.1)

- Relationship between the two goods that determine the sign of the coefficient
- Closeness of relationship between two goods that determines magnitude of the absolute CED values

### 1.3.3 Applications of CED

→ Applying CED to explain changes in demand – CED relevant when there are price changes of related goods

- Price of related good changes, change in demand for good (direction + extent) depends on CED
- Knowledge of CED allows one to explain and predict changes in the market

→ Applying CED to explain behaviours of firms – firms use CED in **business decision-making** as CED provides information on extent to which demand for their products will be affected when price of substitute/complementary products changes

**Example 1** – firm has a product with **high positive CED** in relation to rival's product

- CED between the two products is  $> 1$ , products are close substitutes
- When price of rival's product falls, large decrease in demand for firm's product → fall in demand reduces firm's revenue, and consequently profits
- Firm has to respond to changes in price of rival's product with price and non-price strategies

Price strategy

- If price of substitute falls, firms respond by lowering price of good to prevent a huge loss of existing and potential customers

Non-price strategy – reduce CED between products and substitutes, making good less substitutable

- Aim – increase consumers' brand loyalty, make firm's product less substitutable, reduce effect of rival's pricing policies on demand for firm's product
- Reduction of substitutability achieved through
  - 1. Advertising 2. Adding different features to product
  - Examples – providing better customer services, introducing membership schemes

**Example 2** – firm has a product with **high negative CED** in relation to another firm's products

- CED between two products is  $< -1$ , products are close complements
- When price of other firm's product falls, large increase in demand for firm's product → rise in demand increases firm's revenue and consequently profits
- Firms make non-price decisions to leverage on this

Non-price strategy – output planning and collaboration

- Output planning – if price of complement falls, firms can plan for increase in production of good or release inventory/stocks (if price of complement decreases)
- Collaboration – businesses producing strongly complementary goods can collaborate
  - Firm offering two complementary goods can package them together for sale or display them in the same area so customers can buy both of them at same time (joint promotions)
  - Common points of sale: salad vegetables & sauce found in same section in supermarkets
  - Joint advertising: airline tickets often packaged with hotel accommodation deals

## 1.4 INCOME ELASTICITY OF DEMAND (YED) is a measure of the responsiveness of quantity demanded of a good to a change in consumers' income, ceteris paribus

$$YED = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

### 1.4.1 Interpretation of YED

Sign – coefficient of YED may be positive/negative depending on whether good is an **inferior** or **normal good** (includes necessity and luxury)

- X ignore sign (unlike price elasticities) as sign indicates type of good
- YED can also be zero if demand for good is independent of changes in income

**YED is positive ( $YED > 0$ )** – good is a normal good

- Demand for good is positively related to income, increase in income increases demand for good
- Most goods are normal goods; when income rises, purchasing power of consumers increase, increase demand for normal goods (be it necessity or luxury goods)

### **YED is negative ( $YED < 0$ ) – good is an inferior good**

- Demand for good is negatively related to income, increase in income decreases demand for good
- Why decrease in demand? Inferior goods often replaced by better quality and more expensive goods as consumers become more affluent
- Example – potatoes considered inferior good (cheap and less nutritious food source consumers turn to when they lack money to buy better food); when income rises, consumers replace potatoes in their diet with better quality foods like meats → decrease demand for potatoes

Magnitude – indicates strength of relationship between income and demand for the good

- The stronger income is as a deciding factor when consumers make decisions about purchasing a good, the greater the magnitude will be

Coefficient	Interpretation	Diagram
YED is negative ( $YED < 0$ )	<p><b>Inferior good</b></p> <ul style="list-style-type: none"> <li>• Rise (fall) in income leads to a <u>decrease (increase) in demand</u> from <math>D_0</math> to <math>D_1</math>, ceteris paribus</li> <li>• Example – <math>YED = -0.5</math>, 1% increase in income, 0.5% decrease in demand</li> <li>• Magnitude of shift <u>depends on magnitude of absolute value of YED</u></li> </ul>	
YED is positive ( $YED > 0$ ) & $ YED  < 1$	<p><b>Normal good – necessity</b> (price inelastic)</p> <ul style="list-style-type: none"> <li>• Demand for good is <u>positively income inelastic</u>, income is <u>not a strong determinant</u> for consumers' demand</li> <li>• Rise (fall) in income leads to a <u>less than proportionate increase (decrease)</u> in demand from <math>D_0</math> to <math>D_1</math>, ceteris paribus</li> <li>• Example – <math>YED = 0.5</math>, 1% increase in income, 0.5% increase in demand</li> <li>• <u>Small rightward shift in demand curve for good A</u></li> </ul>	
YED is positive ( $YED > 0$ ) & $ YED  > 1$	<p><b>Normal good – luxury</b></p> <ul style="list-style-type: none"> <li>• Demand for good is <u>positively income elastic</u>, income is a <u>strong determinant</u> of consumers' demand</li> <li>• Rise (fall) in income will lead to a <u>more than proportionate increase (decrease)</u> in demand from <math>D_0</math> to <math>D_1</math>, ceteris paribus</li> <li>• Example – <math>YED = 3</math>, 1% increase in income, 3% increase in demand</li> <li>• <u>Large rightward shift in demand curve for good A</u></li> </ul>	

#### **1.4.2 Determinants of YED – covered in 1.4.1**

Nature of good (inferior or normal) determines whether YED has a positive or negative value

- Inferior goods – negative YED values (negatively related to income)
- Normal goods – positive YED values (positively related to income)

Degree of necessity –  $|YED|$  is dependent on degree of necessity of good

- Normal goods have  $YED > 1$  or  $YED < 1$ ; more basic an item is in consumption pattern of households, the lower YED tends to be

**Examples** – basic food items (bread and rice) vs luxury foods (high quality cuts of meats and prepared food)

- Basic food items – positive income elasticities less than 1
  - Income rises, demand increases, and to a less than proportionate extent
- Luxury food items – positive income elasticities more than 1
  - Income rises, demand increases, and to more than proportionate extent

Level of income of consumer base – degree of necessity is dependent on this

- Lower income levels – only basic necessities have high degree of necessity, others considered luxuries
- Rising income levels + change in lifestyles – less good and services considered as luxuries

**Examples** – a meal at a hawker centre

- Lower income levels – considered as a normal good
- Affluent consumers in market – considered an inferior good in market; meal at a mid-range restaurant – daily occurrence, necessity

Different stages of economic development (countries) – widely different Y elasticities for same products

- $|YED|$  values for same good varies depending on income levels
- Necessity in developed country may be a luxury product in a developing country

**Example** – meat and bus journeys

- Lower YED in developed countries; higher YED in developing countries
- Former deems them to be more of necessities, while latter treats them as luxury goods

### 1.4.3 Application of YED

→ Applying YED to explain changes in demand – YED is relevant when there are changes in income

- When income changes, changes in demand for good (direction & extent) depends on YED

→ Applying YED to explain behaviours of firms – firms use YED in their business decision-making as it provides them with information on the extent to which demand of their products will be affected when income levels change

**Application 1: firms plan their future output accordingly [based on extent to which demand for their products will be affected when income levels change (information provided by YED)]**

**Scenario 1: Economic growth – rising household incomes**

- Firms stand to benefit from a higher demand of normal goods (more for luxuries than necessities)
- Rise in demand increases total revenue for firms, increase profits (assuming costs remain unchanged)
- Firms may use non-price business strategies
  - Channel more resources into developing better quality & highly desirable products ( $YED > 1$ )
  - Examples – travel agencies offer more luxurious holiday packages vs budget travel packages; companies develop smartphones with more luxurious features (titanium plating/leather clad bodies such as brands Vertu and Lamborghini mobile)

**Scenario 2: economic recession – falling household incomes**

- Demand for normal goods fall, demand for inferior goods rises
- Firms may adopt following non-price strategies
  - Channel resources from production of luxury goods to production of normal goods to minimise fall in demand for their products
    - E.g. designer fashion retails produce more designer make-up instead of designer handbags and shoes, since make-up is more necessary and affordable for their consumers as compared to handbags and shoes
  - Promote inferior goods to capture larger share of rising demand for inferior goods in market

**Application 2: use differences in YED across different consumer bases to segment markets**

- Allows firms to produce the appropriate range of products to suit their consumer bases

**Scenario 1 – economic boom, household incomes rise**

- Application of YED to raise total revenue requires large supermarkets to stock up on goods with  $YED > 1$  (luxurious items) at all its outlets nation-wide
- YED values of a good varies across different Y levels → supermarket carries different goods with different degrees of luxury in upper-class income district outlets from that of its heartland's outlets
  - Upper-class income district – premium items (caviar, foie gras)
  - Heartlands – luxurious items like organic food (organic kale, free-range eggs)

**Scenario 2 – international firms marketing products differently in different countries**

- YED of same product differs widely across countries in different stages of economic development
- E.g. computer, developing country – normal; developed country – inferior (replaced with laptops)
- Economic growth (consumers' Y rises) on demand for computers
  - Firms increase capacity to sell in developing countries as demand for is expected to increase
  - Firms reduce capacity to sell computers in developed countries

→ Applying YED to explain government decisions – relevant consideration in gov. decision-making

- Economic growth/recession, affects income of consumers, knowledge of YED of different goods and services helps government predict changes in demand patterns
- Government able to make better decisions in planning their expenditure and implementing policies

**Application 1: Planning** – YED in the housing market

- YED used to predict changes in demand for various types of public housing
- Rising income levels, more than proportionate increase in demand for more luxurious design, build and sell scheme (DBSS) and executive condominiums (EC) as opposed to 3-Room flats
- HDB make better decisions on no. of each type of public housing to build → YED sign + value help HDB allocate scarce resources when deciding whether to build more DBSS and EC or 3-room flats

**Application 2: Policies** – taught in macroeconomics policy decision-making

## 1.5 LIMITATIONS IN THE APPLICATION OF ELASTICITY CONCEPTS

- Useful in explaining & predicting market outcomes, but have limitations in use of elasticity concepts

### 1.5.1 Computation issues – involves collection price & quantity data, inaccurate data → inaccurate analysis

- Applying elasticity concepts, face difficulty in calculating/determining exact elasticity values
- E.g. calculate PED, data on changes in price and quantity demanded required
- Accuracy of data depends on method collection – errors may be made due to large amount of data collected, undermine accuracy of data → PED values inaccurate + use of it may not be reliable

### 1.5.2 Issues with prediction – calculations from past data, past ≠ future

- Values of elasticities calculated from past data, may not be relevant for current use
  - The more outdated data is, the less relevant it becomes
- Nature of present dynamic economy, estimates become outdated quickly
- Result: values of elasticities may not be very useful for prediction of future market changes

### 1.5.3 Cost concerns – if total revenue rises, cost increase; profits will not rise

- Elasticity concepts used to predict revenue changes, but X give any information about costs
- Strategies implemented to increase total revenue might increase costs
- Example – PED > 1, firms decrease prices, increase QD more than proportionately, increase TR; but increase in QD might increase costs, profit might not increase as profit = total revenue – total cost

### 1.5.4 Ceteris paribus assumption – change in QD due to various factors; X keep all other factors constant

- Ceteris paribus (all other things being equal) is a very strict assumption that X hold in reality
- Inaccurate results calculated from static analysis → why? dynamic real world, effects of changes occur and interact together instead of separately
  - E.g. Apply PED concept – only price of good changes, other factors of demand assumed to remain constant → X true in the real world, other factors of demand (Y levels, population size, taste & preferences) are always changing
- Accuracy of value of |PED| compromised when estimation is made based on simplifying assumption → hence, ceteris paribus assumption is unrealistic in predicting effects of price changes on market equilibrium levels of output (similar problem in use of PES, CED, YED)

## SECTION SUMMARY

- Elasticity is a measure of responsiveness of quantity demanded/supplied to a change in one of its determinants (price, price of related good, income)
- If QD/QS changes proportionately more than determinant, magnitude of elasticity is greater than 1, demand/supply is described as elastic
- If QD/QS changes proportionately less than determinant, magnitude of elasticity is less than 1, demand/supply is described as inelastic

PED is a measure of responsiveness of QD of a good to a change in its price, ceteris paribus

- Determinants include number and closeness of substitutes, proportion of income spent on good, habituality of consumption, and time horizon
- Applications – PED is relevant when analysing
  - Extent to which P and Q changes in response to shift in supply
  - Change in revenue in response to change in price

PES is a measure of responsiveness of QD to a change in its price, ceteris paribus

- Determinants include level of stocks/inventories, availability of spare capacity, mobility of factors of production, and time horizon
- Application – PES is relevant when analysing extent to which price and quantity changes in response to shift in demand

CED is a measure of responsiveness of QD of a good to a change in price of another good, ceteris paribus

- Determinants include relationship between two goods (sign), closeness of relationship (magnitude)
- Application – relevant when analysing direction and extent of shift in demand in response to change in price of a related good

YED is a measure of responsiveness of QD of a good to a change in consumers' income, ceteris paribus

- Determinants: whether good is inferior/normal (sign), and if normal, degree of necessity (magnitude)
- Application – YED is relevant when
  - Analysing direction and extent of shift in demand in response to change in income

Firms using elasticity concepts in business decision-making

- Firms use PED, CED, YED to make decisions that can help them respond to market changes, reduce loss of profits/increase profits

Limitations of using elasticity values

- Computation issues, issues with prediction, cost concerns, unrealistic ceteris paribus assumption

## 2. IMPACT OF GOVERNMENT INTERVENTION ON MARKET OUTCOMES

- 5 G interventions: taxes, subsidies, price ceiling, price floors, quotas
- For each measure: 1. Diagram 2. Reasons for implementation 3. Negative consequences 4. Welfare effects (consumer surplus, producer surplus, deadweight loss)

**2.1 TAXES** are compulsory payments to the government, and are used by governments for various reasons

- 1. Raise government revenue
- 2. Resolve market failure
- Indirectly imposed – imposed on expenditure on goods and services
- Directly imposed – imposed on income and wealth

The **incidence of the tax** is the distribution of the burden of tax between sellers and buyers

- Used by economists when analysing the effects of a tax
- Incidence of the tax may fall more on the seller or the buyer, depending on how either is ultimately affected by the taxation

**2.1.1 Indirect taxes** are taxes on goods and services and are paid to the tax authorities indirectly by the suppliers of the goods and services (come in the form of specific tax or ad valorem tax)

- **Specific tax** is an indirect tax of a fixed sum per unit sold
  - E.g. exercise duty on alcohol – \$60/litre; exercise duty on unleaded motor - \$6.40/10 litres
- **Ad valorem tax** is an indirect tax of a certain percentage of the price of the good
  - E.g. Goods and Service Tax (GST) – 7%
- Indirect tax is imposed, tax falls on producers, increases cost of production for firms, supply decreases, represented by a leftward/upward shift of supply curve by the amount of tax

Type of indirect tax	Shift in supply	Diagram
Specific tax	<ul style="list-style-type: none"> <li>Supply curve shifts vertically upwards by amount of tax (\$t)</li> <li>Since amount of tax is the same at all prices, supply curve <u>shifts parallel upwards</u> (leftwards) from <math>S_0</math> to <math>S_1</math></li> <li>Regardless of P, <u>same amount of tax applied</u></li> </ul>	<p>Market for Alcohol</p>
Ad valorem tax (percentage tax)	<ul style="list-style-type: none"> <li>Tax pegged at a certain percentage of the price of the good</li> <li>As price rises, amount of tax paid rises</li> <li>Results in <u>pivotal</u> shift of supply curve from <math>S_0</math> to <math>S_1</math></li> </ul>	<p>Market for Restaurant Food</p>

Note – if details of a tax are not specified, assumed as an indirect for purpose of analysing its effects

Examples – effect on indirect tax (specific tax of \$3) imposed by government on market for good

	<b>Answering techniques</b> <ul style="list-style-type: none"> <li>Supply curve shifts from <math>S_0</math> to <math>S_1</math> in figure 9, imposition of tax causes prices to rise from <math>P_0</math> to <math>P_1</math> and quantity to fall from <math>Q_0</math> to <math>Q_1</math></li> <li>Consumers – before: pay <math>P_0</math>; after: pay <math>P_1</math>, since equilibrium price has changed after fall in supply</li> <li>Producers – before: receive <math>P_0</math>; after: receive <math>P_s</math> after taxation           <ul style="list-style-type: none"> <li>○ Receive <math>P_1</math> from consumers, but pay taxes of \$3 to the government</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Consumer's incidence of tax – reflected by extent of increase in price from <math>P_0</math> to <math>P_1</math></li> <li>Producer's incidence of tax – amount which rise in price is insufficient to cover tax, <math>P_0</math> to <math>P_s</math></li> <li>Incidence of tax is shared between producers and consumers</li> </ul>

Note – equilibrium price X rise by full amount of the per unit tax (difference between  $P_1$  and  $P_0$  < \$3)

## Incidence of taxation between consumers and producers and PED & PES of good

- Incidence of taxation between consumers and producers depend on PED and PES of good, more specifically the relative values of PED to PES

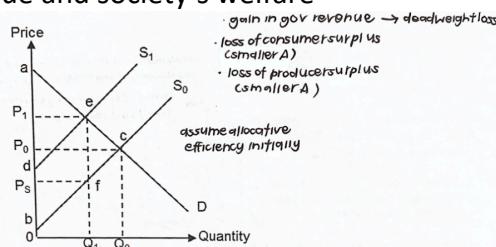
Relative price elasticities	Market outcome	Diagram
PED < PES	<ul style="list-style-type: none"> <li>Tax (ac), supply curve shifts left from <math>S_0</math> to <math>S_1</math></li> <li>Price increases from <math>P_0</math> to <math>P_1</math>, quantity decreases from <math>Q_0</math> to <math>Q_1</math></li> <li>Consumer's incidence of tax – <math>P_0P_1</math>; total burden on consumers – area <math>P_0P_1ab</math></li> <li>Producer's incidence of tax – <math>P_0P_s</math>; total burden on producers – area <math>P_sP_0bc</math></li> <li>Total government's tax revenue – Area <math>P_sP_1ac</math></li> </ul> <p> <ul style="list-style-type: none"> <li>PED &lt; PES – demand is relatively more price inelastic than supply; buyers are less responsive to changes in price of good compared to sellers</li> <li>Buyers bear a greater burden of the tax</li> </ul> </p>	
PED > PES	<ul style="list-style-type: none"> <li>Tax (ac), supply curve shifts left from <math>S_0</math> to <math>S_1</math></li> <li>Price increases from <math>P_0</math> to <math>P_1</math>, quantity decreases from <math>Q_0</math> to <math>Q_1</math></li> <li>Consumer's incidence of tax – <math>P_0P_1</math>; total burden on consumers – area <math>P_0P_1ab</math></li> <li>Producer's incidence of tax – <math>P_0P_s</math>; total burden on producers – area <math>P_sP_0bc</math></li> <li>Total government's tax revenue – Area <math>P_sP_1ac</math></li> </ul> <p> <ul style="list-style-type: none"> <li>PED &gt; PES – demand is relatively more price elastic than supply; buyers are more responsive to changes in price of good compared to sellers</li> <li>Sellers bear a greater burden of the tax</li> </ul> </p>	

## Impacts of welfare of consumers, producers and society as a whole (due to indirect tax)

- Presence of market failure – government intervention (via taxation) may serve to resolve market failure to achieve efficiency in the market (taught in market failure)
- Absence of market failure – indirect taxation may result in welfare loss and inefficiency in the market

### Example – effect of indirect tax (specific) on welfare

- Free market output level  $Q_0$  is initially allocatively efficient
- Imposition of indirect tax – supply curve shift from  $S_0$  to  $S_1$ , changes in consumer surplus, producer surplus, government revenue and society's welfare



### Answering techniques

- Consumer surplus falls from area  $P_0ac$  to area  $P_1ae$ ; loss of consumer surplus of area  $P_0P_1ec$
- Producer surplus falls from area  $P_0bc$  to area  $P_sfb$ ; loss of producer surplus of area  $P_0P_sfc$
- Government revenue of area  $P_sP_1ef$  is gained; government revenue contributes to society's welfare
- Change in society's welfare = change in consumer surplus ( $-P_0P_1ec$ ) + change in producer surplus ( $-P_0P_sfc$ ) + change in government revenue ( $P_sP_1ef$ )
- Overall loss in society's welfare area ecf → constitutes to a deadweight loss to society

### Welfare impacts with the imposition of the sales tax

- Consumer surplus fell – maximum price consumers are willing and able to pay X change, but actual price consumers have to pay increased from  $P_0$  to  $P_1$  and fall in QS of good from  $Q_0$  to  $Q_1$
- Producer surplus fell – actual price retained (after government has collected tax) from selling of the goods fell from  $P_0$  to  $P_s$  and quantity of good sold fell from  $Q_0$  to  $Q_s$
- Part of losses in consumer & producer surpluses transferred to government as increase in tax revenue
  - Losses X fully recouped by the government → society experiences a deadweight loss
- **Deadweight loss** represents welfare benefits that are lost to society because resources are not allocated efficiently (in the above case, the loss of benefits due to under-allocation of scarce resources to the production of the good)

**2.1.2 Direct taxes** are taxes on income and wealth and are paid to the tax authorities directly by the economic agent with the income/wealth

- Can be imposed on households (consumers) in the form of personal income taxes
- Affect the willingness and ability of households to consume goods and services, leads to a leftward shift of the demand curve

Example – government increases direct taxes (personal income tax)

	<ul style="list-style-type: none"> <li>• Reduces consumers' disposable income, leads to a fall in purchasing power and a fall in demand for goods and services, demand curve shifts from <math>D_0</math> to <math>D_1</math></li> <li>• Rise in direct tax causes prices to fall from <math>P_0</math> to <math>P_1</math> and quantity to fall from <math>Q_0</math> to <math>Q_1</math></li> <li>• Note – direct taxes (personal income tax) create negative welfare effects on households/consumers by reducing their disposable incomes and ability to purchase goods/services</li> </ul>
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**2.2 SUBSIDIES** are cash transfers from the government to the producer/consumer, and can be used by governments to resolve market failure and/or as a response to inequity

- Indirect grant of subsidies – expenditure on goods & services
- Direct grant of subsidies – income & wealth
- **Incidence of the subsidy** is the direct distribution of the share of subsidy between sellers and buyers
  - Used by economists when analysing the effects of a subsidy
  - Incidence of tax may fall more on the seller or buyer depending on how either is ultimately affected by the subsidy

**2.2.1 Indirect subsidies** granted by the tax authorities indirectly to the suppliers of the goods & services, instead of to the consumers; work like negative indirect taxes; in form of specific subsidy/ad valorem subsidy

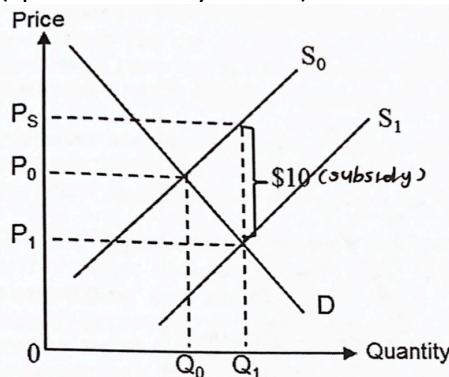
- **Specific subsidy** – fixed sum per unit sold; **ad valorem subsidy** – certain percentage of price of good
- Indirect taxes are granted producers of the good/service (specifically when a subsidy is granted), decreases cost of production for firms, supply curve shifts downwards/rightwards by the amount of the subsidy from  $S_0$  to  $S_1$

Type of indirect subsidy	Shift in supply	Diagram
Specific subsidy	<ul style="list-style-type: none"> <li>• Supply curve shifts vertically downwards by amount of subsidy (\$s)</li> <li>• Since amount of subsidy is <u>the same at all prices</u>, supply curve shifts <u>parallel</u> downwards (rightwards) from <math>S_0</math> to <math>S_1</math></li> </ul>	<p>Market for Healthcare</p>

Ad valorem subsidy	<ul style="list-style-type: none"> <li>Ad valorem subsidy is pegged at a certain percentage of the price of the good</li> <li>As <u>price rises, amount of subsidy granted rises</u></li> <li>Results in downward (rightward) <b>pivotal</b> shift of supply curve from <math>S_0</math> to <math>S_1</math></li> </ul>	<p>Market for Restaurant Food</p>
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Note – if details of a subsidy are not specified, it can be assumed to be an indirect subsidy

Example – effect of indirect subsidy (specific subsidy of \$10) on market for food



#### Answering techniques

- Supply curve shifts from  $S_0$  to  $S_1$
- Granting of indirect subsidy will cause price to fall from  $P_0$  to  $P_1$  and quantity to rise from  $Q_0$  to  $Q_1$
- Consumers – before: pay  $P_0$ ; after: pay  $P_1$ , since equilibrium price has changed after fall in supply
- Producers – before: receive  $P_0$ ; after: receive  $P_s$ 
  - Receive  $P_1$  from consumers, but granted subsidy of \$10 by government to receive  $P_s$
- Consumer's incidence of subsidy – reflected by extent of decrease in price from  $P_0$  to  $P_1$
- Producer's incidence of tax – excess of the subsidy after the fall in price, which is  $P_0$  to  $P_s$
- Incidence of subsidy is shared between producers and consumers, impact initially felt by producers

Note – Equilibrium price X fall by the full amount of the per unit subsidy (difference between  $P_1$  and  $P_0$  is less than \$10); full share of subsidy of \$10 is the difference between  $P_1$  and  $P_s$

#### Incidence of subsidy between consumers and producers and PED & PES of good

- Incidence of subsidy between consumers and producers depend on PED and PES of good, more specifically the relative values of PED to PES

Relative price elasticities	Market outcome	Diagram
PED < PES	<ul style="list-style-type: none"> <li>Subsidy (ac), supply curve shifts right from <math>S_0</math> to <math>S_1</math></li> <li>Price decreases from <math>P_0</math> to <math>P_1</math>, quantity increases from <math>Q_0</math> to <math>Q_1</math></li> <li>Consumer's incidence of subsidy – <math>P_0P_1bc</math>; total share of subsidy for consumers – area <math>P_0P_1bc</math></li> <li>Producer's incidence of subsidy – <math>P_0P_s</math>; total share of subsidy for producers – area <math>P_sP_0ab</math></li> <li>Total government's expenditure – Area <math>P_sP_0ac</math></li> </ul> <p>PED &lt; PES – demand is relatively more price inelastic than supply; buyers are less responsive to changes in price of good compared to sellers</p> <ul style="list-style-type: none"> <li>Buyers enjoy a greater incidence of the tax</li> </ul>	

PED > PES	<ul style="list-style-type: none"> <li>Subsidy (ac), supply curve shifts right from <math>S_0</math> to <math>S_1</math></li> <li>Price decreases from <math>P_0</math> to <math>P_1</math>, quantity increases from <math>Q_0</math> to <math>Q_1</math></li> <li>Consumer's incidence of subsidy – <math>P_0P_1</math>; total share of subsidy for consumers – area <math>P_0P_1bc</math></li> <li>Producer's incidence of subsidy – <math>P_sP_0</math>; total share of subsidy for producers – area <math>P_sP_0ab</math></li> <li>Total government's expenditure – Area <math>P_sP_1ac</math></li> <li><math>PED &gt; PES</math> – demand is relatively more price elastic than supply; buyers are more responsive to changes in price of good compared to sellers</li> <li>Sellers enjoy a greater incidence of the tax</li> </ul>	
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#### Impacts of welfare of consumers, producers and society as a whole (due to indirect subsidies)

- ✓ market failure – government intervention resolves market failure to achieve efficiency in market
- ✗ market failure – indirect subsidies result in welfare loss and inefficiencies in the market

#### Example – effect of indirect subsidy (specific) on welfare

- Free market output level  $Q_0$  is initially allocatively efficient
- Imposition of indirect subsidy – supply curve shift from  $S_0$  to  $S_1$ , changes in consumer surplus, producer surplus, government revenue and society's welfare

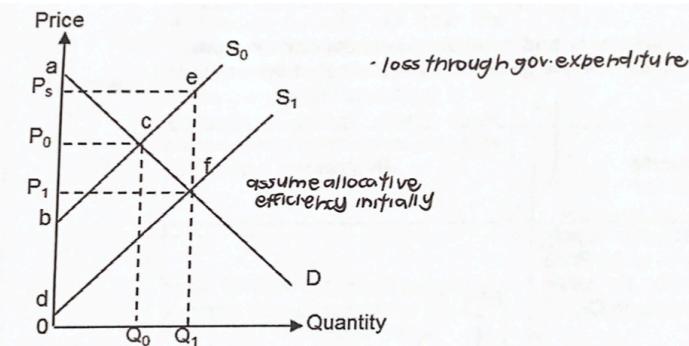


Figure 13: Effect of indirect subsidy (specific) on welfare

#### Answering techniques – subsidies are allocatively inefficient (decreases society's welfare)

- Consumer surplus rises from area  $P_0ac$  to area  $P_1af$ ; gain in consumer surplus of area  $P_1P_0cf$
- Producer surplus rises from area  $P_0bc$  to area  $P_sbe$ ; gain in producer surplus of area  $P_sP_0ec$
- Government expenditure on subsidy is area  $P_1P_sef$ ; government expenditure comes at the expense of society's welfare since it requires tax revenue
- Change in society's welfare = change in consumer surplus ( $+P_1P_0cf$ ) + change in producer surplus ( $+P_sP_0ec$ ) + change in government revenue ( $-P_sP_1ef$ )
- Overall loss in society's welfare area  $ecf \rightarrow$  constitutes to a deadweight loss to society

#### Welfare impacts with the granting of the indirect subsidy

- Consumer surplus rose – maximum price consumers are willing and able to pay X change, but actual price consumers have to pay decreased from  $P_0$  to  $P_1$  and rise in QS of good from  $Q_0$  to  $Q_1$
- Producer surplus rose – actual price received (after government has granted the subsidy) from selling of the goods rose from  $P_0$  to  $P_s$  and quantity of good sold rose from  $Q_0$  to  $Q_s$
- Part of government expenditure transferred to society as gains in consumer and producer surpluses
  - Gains X fully recover the government expenditure  $\rightarrow$  society experiences a deadweight loss
- Deadweight loss** represents welfare benefits that are lost to society because resources are not allocated efficiently (in the above case, the loss of benefits due to over-allocation of scarce resources to the production of the good)

**2.2.2 Direct subsidies** work like negative direct taxes, and are granted by the tax authorities directly to the economic agent with the income/wealth

- Given to households in the form of cash grants
- Increases the willingness and ability of households to consume goods and services, increases disposable income/purchasing power, leads to rightward shift of the demand curve

Example – government increase direct subsidies (GST Voucher Handouts)

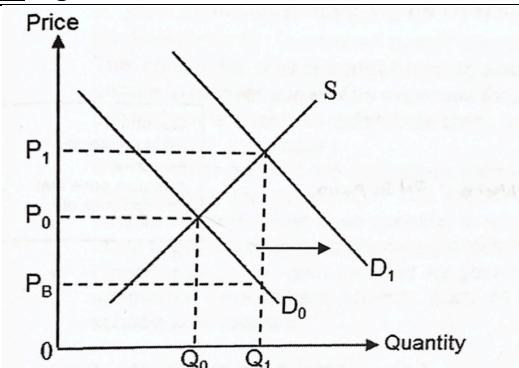


Figure 14: Effect of direct subsidy on market for food

- Demand curve shifts from  $D_0$  to  $D_1$
- Increase in subsidy causes price to rise from  $P_0$  to  $P_1$  and quantity to rise from  $Q_0$  to  $Q_1$
- Note – direct subsidies (e.g. cash handouts/GST vouchers) to households create positive welfare effects on households/consumers as it raises their ability to purchase goods/services

**2.3 PRICE CONTROLS** refer to the setting of minimum or maximum prices by the government so that prices are unable to adjust to their free-market equilibrium level determined by the market demand and supply

- Part of gov's prices & income policy implemented with aim of achieving price stability & equity
- Unintended consequence – result in market disequilibrium, result in shortages and surpluses

**2.3.1 Minimum price** is a **price floor**, which is a legally established minimum price to prevent prices from falling below a certain level (although it is allowed to rise above it)

- To be effective, price floor must be set above the market equilibrium price
- Reasons for setting a price floor
  - To protect producers' income, especially when prices are volatile
  - To create a surplus which can be stored in preparation for future shortages
  - (minimum wages) To protect workers & prevent wage rates from falling below a certain level

Effect of a minimum price (price floor) on a market

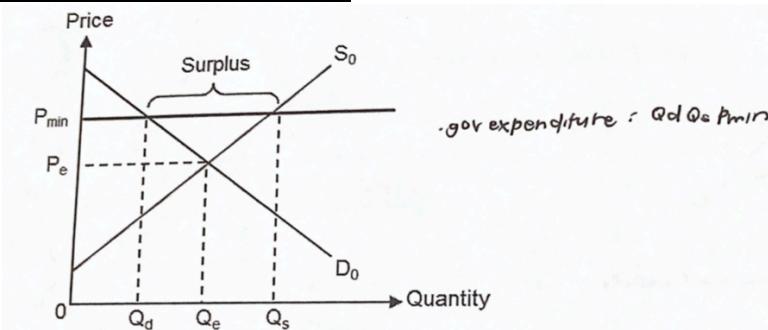


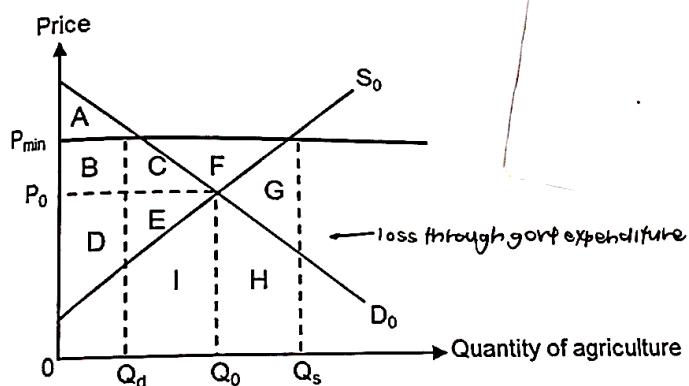
Figure 15: Effect of minimum price (price floor) on a market

- Assuming free market equilibrium level of output  $Q_e$  is allocatively efficient
- Results in surplus & over-allocation of scarce resources to the production of the good (overproduction) → result in allocative inefficiency
- Minimum price set at  $P_{\min}$ ; at  $P_{\min}$ , a surplus of  $Q_d - Q_s$  is created; at higher prices
  - QD decreases from  $Q_e$  to  $Q_d$  (according to Law of Demand)
  - QS increases from  $Q_e$  to  $Q_s$  (according to Law of Supply)
- Since  $Q_S > Q_D$ , there is a surplus and the market is in disequilibrium

**Factors determining size of surplus**

- Level at which price is set – the higher the price floor/minimum price set, the greater the surplus
- PED/PES – the greater the value of PED and/or PES, the greater the surplus
- Changes in demand/supply – if demand decreases/supply increases, the surplus increases

## Effect of minimum price (price floor) on welfare



- Loss in consumer surplus – from Area A + B + C to Area A
  - Price consumers have to pay rose from  $P_0$  to  $P_{\min}$  and QS of good decreased from  $Q_0$  to  $Q_s$
- Gain in producer surplus – from D + E to Area D + E + B + C + F
  - Price producers received rose from  $P_0$  to  $P_{\min}$  and QS of good sold from  $Q_0$  to  $Q_s$  ( $Q_d$  is bought by consumers,  $Q_dQ_s$  bought by gov)
- Government expenditure on surplus – price ( $P_{\min}$ ) x quantity ( $Q_dQ_s$ ) = Area C + E + I + H + G + F
  - Government expenditure comes at expense of society's welfare since it requires tax revenue
- Change in society's welfare = change in consumer surplus (-Area B+C) + change in producer surplus (Area B+C+F) + change in government expenditure [-(C+E+I+H+G+F)]
  - Overall loss of society's welfare of Area C+E+I+H+G → society experiences deadweight loss

**Deadweight loss** represents welfare benefits that are lost to society as resources are not allocated efficiently

- Society experiences a deadweight loss ...
  - Government is unable to recover some of its expenses through the resale of the stored agriculture products or is unable to redistribute them (perishable agriculture products)
- Deadweight loss incurred by society is significantly smaller/(best-case scenario) no deadweight loss
  - All stored products can be resold
- Opportunity cost incurred as government funds can be used to finance alternative development projects (transport networks, building of schools, and hospitals)

Good	Bad
<ul style="list-style-type: none"> <li>• Protect income (agriculture products)</li> <li>• Minimum wage (improve income inequality)</li> </ul>	<ul style="list-style-type: none"> <li>• Involves government spending (opportunity costs)</li> <li>• Surplus</li> <li>• Deadweight loss → societal welfare X maximised</li> </ul>

**2.3.2 Maximum price** is a **price ceiling**, which is a legally established maximum price to prevent prices from rising above a certain level (producers are prohibited from selling above the stipulated price)

- To be effective, price ceiling must be set below the market equilibrium price
- Imposed with the aim of achieving some form of equity
  - Rental controls (price ceiling) – make housing more affordable for low-income earners
  - Food price controls – make certain goods (necessities) more affordable to low-income earners, especially during times when food prices are rising rapidly
  - Price capping (maximum price) when competition authorities judge that consumers are being exploited by businesses using their monopoly power

#### Effects of a maximum price (price ceiling) on a market

- Assuming free market equilibrium level of output  $Q_e$  is allocatively efficient
- Results in shortage & under-allocation of scarce resources to the production of the good (underproduction) → result in allocative inefficiency
- Maximum price set at  $P_{max}$ ; at  $P_{max}$ , a shortage of  $Q_s Q_d$  is created; at lower prices
  - QD increases from  $Q_e$  to  $Q_d$  (according to Law of Demand)
  - QS decreases from  $Q_e$  to  $Q_s$  (according to Law of Supply)
- Since  $QD > QS$ , there is a shortage, and the market is in disequilibrium

#### Factors determining size of shortage

- Level at which price ceiling is set – lower price ceiling/maximum price set, the greater the shortage
- Price elasticity of demand and supply – greater value of PED and/or PES, the greater the shortage
- Changes in demand or supply – if demand increases/supply decreases, shortage increases

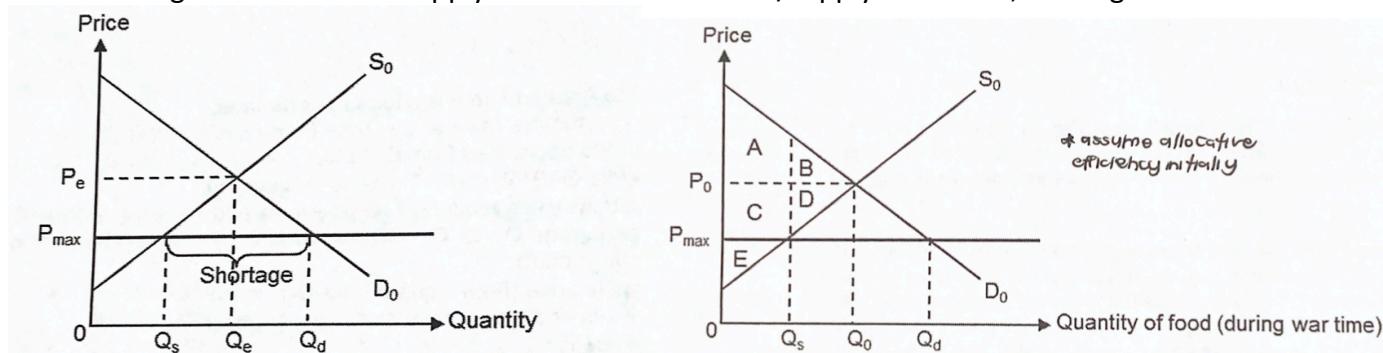


Figure 17: Effect of maximum price (price floor) on a market

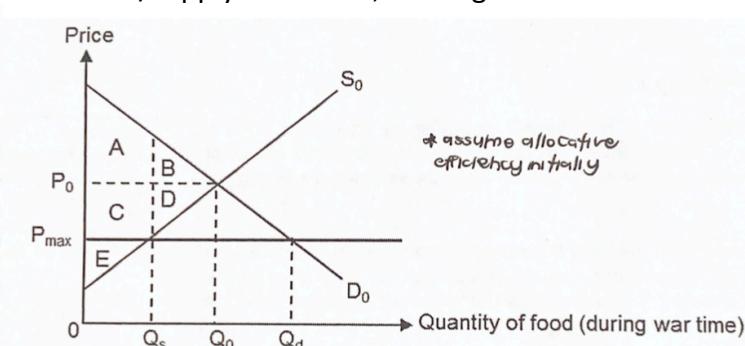


Figure 18: Effect of maximum price on welfare

#### Effect of maximum price (price ceiling) on welfare of consumers, producers and society as a whole

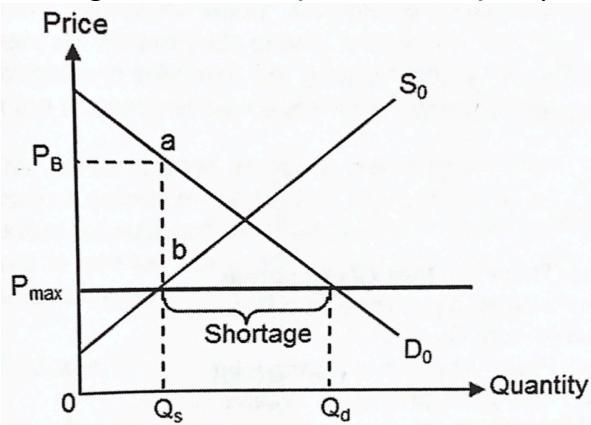
##### → Deadweight loss in society

- Government may set a maximum price on basic goods (food) during wartime
- Price ceiling set at  $P_{max}$ , only  $Q_s$  is produced, market can only trade up to  $Q_s$  regardless of level of QD
- Change in consumer surplus – from Area A + B to Area A + C
  - Price consumers have to pay fell from  $P_0$  to  $P_{max}$ , but quantity of food consumed decreased from  $Q_0$  to  $Q_s$  (since only  $Q_s$  can be traded)
  - More intuitively, consumers who are able to obtain food at  $P_{max}$  benefit from price ceiling, but consumers as a whole suffer as fall in QS available from  $Q_0$  to  $Q_s$
- Loss in producer surplus – from Area C + D + E to Area E; total loss of Area C + D
  - Price producers received fell from  $P_0$  to  $P_{max}$ ; QS of agriculture sold decreased from  $Q_0$  to  $Q_s$
- Change in society's welfare = change in consumer surplus (Area -B+C) + change in producer surplus [-(Area C+D)]; Overall loss of society's welfare of Area B + D → constitutes a deadweight loss

##### → Need for alternative forms of non-price rationing of food during wartime as price ceiling causes shortage

- Free market: rationing is achieved by price mechanism; price controls interfere with price mechanism
- Shortages due to price ceiling
  - Result in queues if goods are sold on a first-come-first-serve basis
  - Require the distribution of limited coupons to interested buyers
  - Cause the restriction of sales to favoured customers
- Consequence/outcome – hurt the group of people the policy is intended to help

→ **Underground market (black market)** may emerge as a result of price ceiling



- Situation where people ignore the government's price ceiling and sell illegally at free market prices
- Ref to Fig 19, due to shortage of  $Q_d - Q_s$  at maximum price of  $P_{\max}$ , some consumers will be willing to pay a price above  $P_{\max}$  to get hold of the good
  - Specifically, consumers could be charged the highest price they would be willing and able to pay, up to  $P_B$  by unscrupulous sellers

Mitigating downsides of price ceilings – to minimise problems arising from a price ceiling (i.e. eliminate the shortage while maintain prices at  $P_{\max}$ ), governments can

- Encourage increase in supply through drawing on past surpluses
- Engage in direct production or give subsidies/tax relief to producers
- Reduce demand by controlling income
- Producing more alternatives for the good in question

Good	Bad
<ul style="list-style-type: none"> <li>• Ensures the affordability of basic necessities (e.g. housing, food, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Shortage → deadweight loss → societal welfare X maximised</li> <li>• Non-price rationing</li> <li>• Black market</li> </ul>

## 2.4 QUANTITY CONTROLS refer to the setting of fixed output level by the government

- Result in unintended consequences arising from the resultant disequilibrium

### 2.4.1 Quotas are limits on quantity produced imposed by the government through legislation and regulation

- Effective price controls – price ceiling: set below; price floors: set above free market equilibrium
- Effective quota – quantitative restriction must be set below market equilibrium quantity
  - Employed by government as a measure to control quantity of goods & services exchanged in free market when quantity exchanged is deemed to be too high
  - Total ban if the good (quota = 0) – extreme case of quantity control
- Example – production quotas introduced on sugar and milk in mid-1980s as part of the reformation of the European Union's Common Agricultural Policy (CAP); limits to work-week to 35 hours in France; catch limits in fisheries; maximum emission limits

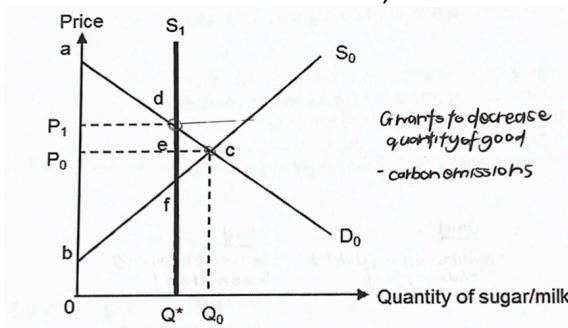


Figure 18: Effect of production quota on market for sugar/milk

Example – effect of production quota on market for sugar/milk

- Consumer surplus falls from area  $P_0ac$  to area  $P_1ad$ ; loss of consumer surplus of area  $P_0P_1dc$ 
  - Price paid rose from  $P_0$  to  $P_1$ ; quantity of sugar/milk transacted decreased from  $Q_0$  to  $Q^*$
- Producer surplus changes from area  $P_0bc$  to  $P_1dfb$ ; change in producer surplus of area  $P_0P_1de - ecf$ 
  - Price producers receive rose; quantity of sugar/milk sold decreased from  $Q_0$  to  $Q^*$
- Change in society's welfare = change in consumer surplus  $[-(area\ P_0P_1dc)]$  + change in producer surplus  $(area\ P_0P_1de - ecf) \rightarrow$  overall change in society's welfare of  $-(area\ cdf)$

## SECTION SUMMARY

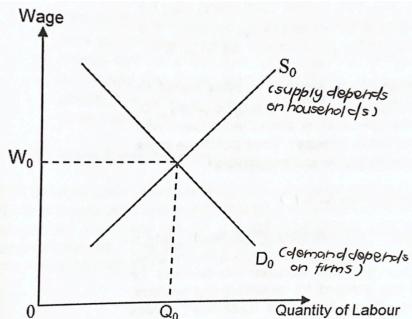
Government interventions may be in the form of taxes, subsidies, price controls (ceiling & floor) & quantity controls

- Taxes are compulsory payments to the government and may be indirect or direct
  - Indirect taxes are taxes on expenditure
    - Paid to tax authorities **indirectly** by suppliers of goods & services instead of by consumer
    - Come in the form of specific tax (per unit tax) or ad valorem tax (percentage tax)
    - Indirect taxes decrease supply
  - Direct taxes are taxes on income and wealth
    - Paid to tax authorities **directly** by economic agent with the income/wealth
    - Direct taxes decrease demand
- Subsidies are cash transfer from the government to the producer or consumer and may be indirect or direct
  - Indirect subsidies are cash transfer from government to producer/consumer; may be indirect/direct
  - Direct subsidies work like negative direct taxes; increase demand
- Incidence of tax/share of subsidy is distributed between buyers and sellers
  - Distribution depends on the relative price elasticities of demand and supply
  - The lower PED/PES, the greater the incidence of tax share of subsidy on the buyer/seller
- Price controls refer to the setting of minimum or maximum prices by the government.
  - A minimum price is a price floor; only effective when it is set above the market equilibrium price.
  - A maximum price is a price ceiling; only effective when it is set below the market equilibrium price
  - Results in shortages (price ceiling) or surpluses (price floor), result in welfare loss to society
- Quantity controls refer to the setting of fixed output level by the government and includes quotas.
  - A quota is a limit on the quantity produced imposed by the government
  - Only effective when set below market equilibrium quantity
- All forms of government intervention result in changes in price and/or quantity in the market.
  - Changes desirable if they address market failure arising from inefficiency or inequity
  - Absence of market failure: government distortion of market results in welfare losses (deadweight loss)

### **3. LABOUR MARKET** – one of the markets in which the theory of price mechanism can be applied

- Market for labour: households become sellers; firms become buyers
  - Households supply labour effort that firms demand
- Labour as a resource is bought and sold
  - Price of labour is wages; Quantity of labour traded in market measured in terms of hours worked/number of employed
- Labour markets generally refers to the market for all types of workers; but market definition can be narrowed down to specific types of labour – high-skilled, low-skilled, specialised

Example – market for engineers



- Y-axis is labelled wage; X-axis is labelled quantity of labour, hours worked/employment
- Buyers and sellers in labour market are different from the goods market → different determinants of labour demand and labour supply from that in a goods market

**3.1 LABOUR DEMAND** – is labour demanded for by firms, and the labour demand depends on how much revenue each unit of labour can bring to the firm

- Wage and non-wage determinants of the demand for labour (corresponds to price and non-price determinants of demand)
- Relationship between wages and quantity demanded of labour follows Law of Demand

**Non-wage determinants (apart from wage)**

→ **Demand for final goods and services** (any rise in demand will indirectly increase demand for labour)

- Demand for labour is derived from the demand for final goods and services
- Rise in demand for final goods and services increases the demand for labour

→ **Price of final goods and service**

- Price of final goods and services increases, firms want to increase quantity supplied of the good/service (Law of Supply)
- To raise quantity supplied, they will have to employ more labour to produce a greater amount of the final good/service, increasing demand for labour

→ **Labour productivity** is defined as the amount/level of output that is obtained from an employee

- Increase in productivity of labour means that each unit of labour employed is able to bring in more revenue for the firm → firms increase demand
- Increase amount of goods/services produced by each worker; increase in revenue each worker brings

→ **Supply of alternative factors of production/complementary factors of production**

Change in supply of alternative factors of production

- Affects the prices of these alternatives, firms switch between labour inputs & other alternative inputs
- Example – capital goods (automation machinery) may be able to replace labour, supply of capital goods increases, price falls, firms replace labour with capital, labour demand falls

Change in supply of a complementary factor of production

- Supply of complementary FOP rises, price falls, firms purchase more of factors, more labour required
- Example – specialised machinery can only be operated by skilled technicians and machinists, machinery becomes cheaper, firms purchase more of them, increase their demand for technicians and machinists

→ **Changes in technology/method of production**

- Technological advancements may augment productivity of labour, increasing demand for labour
- Changes in technology and/or methods of production affect different types of labour differently
- Example – 3-D printing increases demand for specialised engineers, reduce demand for assembly-line workers; chatbots reduce need for some customer service representatives, but increase demand for developers familiar with Natural Language Processing (NLP)

**3.2 LABOUR SUPPLY** is labour supplied by households, and the labour supply depends on the decisions made by households when they allocate their resources (time and effort)

- Wage and non-wage determinants of supply of labour (correspond to price and non-price determinants of supply)
- Relationship between wages and quantity supplied of labour generally follows the Law of Supply

#### Non-wage determinants (other than wages)

→ **Immigration** – movement of workers from country to country affects labour supply

- Example – when immigrants come to SG, supply of labour in SG rises while supply of labour in the immigrants' home country decreases

→ **Changes in educational attainment/job qualifications**

- Higher education attainment, workers qualify for higher-skilled jobs, increases supply of labour to particular industry
- Example – increase in medical school graduates increases supply of doctors in market for doctors
  - If job qualifications are raised (government requiring doctors to have more certification and training), less workers will qualify for the job, supply of labour in that industry falls

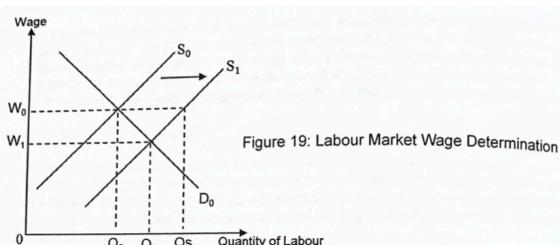
→ **Changes in non-wage benefits of jobs (incentives)**

- Affects the overall attractiveness of a job, determines no. of people willing to work at existing wage levels, affects supply of labour (e.g. increasing medical and leave benefits of a job, increases willingness of workers to supply their labour to the job)
- Non-wage benefits of jobs include – pleasantness of work environment, job satisfaction, security, status, holidays, perks and other fringe benefits

→ **Change in alternative employment opportunities**

- Relative attraction of one job compared to others affects the supply of labour to a particular market
- Example – drivers perceive the returns to being a private-hire car driver (Ryde, Grab, Go-Jek) to be greater than that of being a licensed taxi driver, more drivers switch from driving a taxi to driving private-hire cars → increase in supply of Ryde/Grab/Go-Jek drivers, fall in supply of taxi drivers

#### 3.3 WAGE DETERMINATION – determination of wages in labour market follows price mechanism



- Immigration and supply of labour rises from  $S_0$  to  $S_1$
- At prevailing wage rate  $W_0$ , surplus of labour ( $Q_0Q_s$ ) → unemployment
- Wages driven downwards until the surplus is eliminated at the new wage rate  $W_1$ , where employment has risen to  $Q_1$

- Falling wage acts as a signal and incentive
- Firms – signal a surplus in the labour market, provide firms with incentive to hire more labour, increase quantity demanded along labour demand curve from  $Q_0$  to  $Q_1$
- Workers – signal to workers, provide them with incentive to decrease quantity supplied along the new supply curve  $S_1$  from  $Q_s$  to  $Q_0$  where they offer less of their services at the lower wage
- Firms and workers respond to price signals and incentives → reallocation of labour resources with firms → firms hire more labour  $Q_1$  at lower equilibrium wage rate  $W_1$

#### 3.4 WAGE DIFFERENTIALS – differences in wages across different labour markets exist in free market

- Exist due to differences in levels of 1. demand and 2. supply of labour
- Differences in 3. price elasticities of supply (PES) of labour and 4. price elasticities of demand (PED) of labour determines the extent of wage changes in response of demand and supply changes
- 5. Government policies (minimum wage, trade union)
- 6. Labour market imperfection
- 7. Non-economic reasons (discrimination)
- Refer to appendix 5 for information on the determinants of PED and PES of labour

## Reasons for wage differentials

→ workers are not homogenous (supply)

Differences in skills and abilities of workers affects demand for labour

- Why? productivity of labour determines desirability of labour to firms, affecting firms' willingness and ability to demand for labour
- More productive workers, more revenue for firm, in greater demand than less productive workers
- Higher demand for high-skilled workers → higher wages

Price elasticity of supply of labour in market affects wages

- Price inelastic supply of surgeons due to immobility of labour entering the market (takes years to train a surgeon in medical school)
- Quantity of surgeons supplied cannot respond easily to wage changes → increase in demand for surgeons, large shortage created, large rise in wages required for market for surgeons to clear

→ jobs are not homogenous (demand)

Differences in jobs (skills required, attractiveness of job scope & work environment) affects supply of labour

- Lower supply of labour → higher wages
- Job requiring specialised skills (e.g. lawyer) – limited supply of labour as unskilled workers are unable to provide labour for that market
- Job involving higher rises (e.g. coal miners) or limited career progression – reduced willingness of workers to provide labour

Price elasticity of demand for labour in market affects wages

- Price inelastic demand for lawyers due to lack for legal services
- Law firms unresponsive to wage changes, continue to demand for lawyers even if wages increase
- Thus, if lawyers leave the market (due to unattractive working conditions), supply of lawyers fall → large shortage created since QD by firms remains the same → large rise in wages required for market for lawyers to reach equilibrium

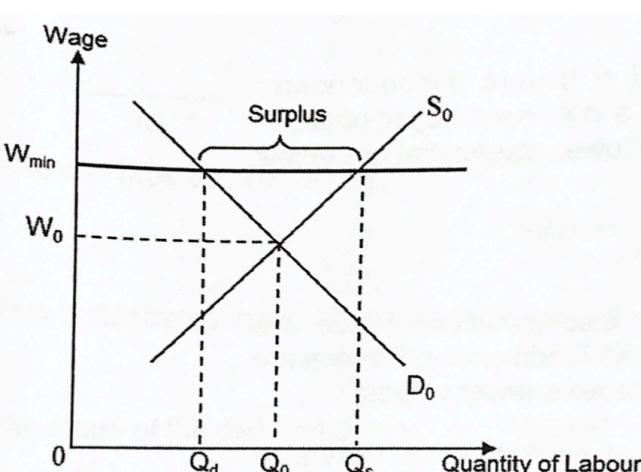
→ governments may intervene – in labour market to influence the wage rate

- E.g. minimum wage laws, determination of CPF rates (SG), restrictions on supply of foreign workers
- Example – minimum wages in European countries (e.g. France, Germany)
  - Aim – impose minimum wage policy in particular labour markets to protect their livelihood
  - Government's response to observation of increasing no. of low-wage workers in many European countries in early 1990s → people working as cleaners, security guards and shop assistants receive very low wage rates

Effects of minimum wage policy – aim: designed to raise wages of low-wage workers

- Results in unemployment; may encourage illegal employments
- Minimum wage  $W_{\min}$  is set above free market equilibrium wage  $W_0$

Effects of minimum wage on labour market



- Wage rate rose, quantity of labour demanded by firms decreases from  $Q_0$  to  $Q_d$ 
  - Represents workers who lost their job due to implementation of minimum wage
- Quantity of labour supplied by households increases from  $Q_0$  to  $Q_s$ 
  - Higher wages entice more people to join labour force, increases willingness of workers to supply their labour hours
- Result: surplus of labour arises  $Q_s - Q_d \rightarrow$  indicates level of unemployment created by imposition of minimum wage

## Factors determining size of surplus created

### → level at which minimum wage is set

- Greater the deviation between market equilibrium wage  $W_0$  and minimum wage  $W_{\min}$ , the higher the level of unemployment

### → price elasticities of labour demand and labour supply

- Degree of unemployment in affected industry depends on the PED and PES in the labour market
- Degree of substitutability of low-skilled workers is high → PED values tend to be high (demand for low-skilled workers is price elastic → extent of unemployment caused by minimum wage policy will be large → limit effectiveness of minimum wage policy intended to help low-skilled workers)

### → changes in demand and supply

- If demand decreases/supply increases, rate of unemployment increases

### → labour market is not perfectly competitive (labour market imperfections)

- Price mechanism explains wage changes in labour market, but is only a model for general analyses
- Wage X solely determined by free market demand and supply forces → deviates from assumption of perfect competition in the free market

### Supply of labour is not perfectly competitive

- Workers (sellers of labour hours) have market power by establishing a **trade union**
- Industries with more powerful trade unions, higher wage than other industries → why? workers X competing against each other for jobs, X offer lower wages to firms
- Certain professional bodies use artificial restraints as prerequisites for membership to restrict QS to ask for higher wages

### Demand for labour is not perfectly competitive

- Firms (buyers) have market power if they are **monopolists** (dominant buyer of factor services in mkt)
- Monopolists can exploit its position by offering only lower wages below free market level since it is the only buyer of labour

### → Non-economic factors – discrimination (another major reason giving rise to wage differentials)

- Wage differentials arise due to gender, race, age, religion or disability
- Traditionally – females paid less than their male counterparts; elderly tend to receive lower wages

## **Limitations/Negative implications of a minimum wage**

### Unfavourable labour-saving techniques

- Higher wage rate imposed, firms face higher labour costs
- Long run – firms develop and switch to labour-saving techniques of production, which encourages higher productivity, lowering costs per unit of output
- **Technological unemployment** – might arise as high-tech production methods displace labour
- **Illegal employment** – of some workers at wages below legal minimum wage; involves illegal immigrants willing to supply their labour at very low wages, reduces effectiveness of minimum wage

### Singapore's labour market and wages – not purely determined by free market forces

- Tripartite organisation (National Wages Council – NWC) gives recommendations on wages
- Refer to Appendix 6 for information about NWC

Good	Bad
<ul style="list-style-type: none"> <li>• Increase income (standard of living, inclusive growth)</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in unemployment – surplus (diagram); <math>Q_s &gt; Q_d</math></li> <li>• Illegal employment below minimum wage</li> <li>• Encourages substitution with other factor inputs; from high labour methods (i.e. labour intensive)</li> </ul>

## SECTION SUMMARY

- Labour market made of – households (sellers of labour hours); firms (buyers of labour hours)
  - Price of labour – wages; quantity of labour traded – measured in terms of hours worked/no. employed
- Determinants of the demand for labour (5 factors)
  - Demand for final goods and services, price of final goods and services, productivity of labour, supply of alternative factors of production/complementary factors of production, changes in technology/method of production
- Determinants of supply of labour (4 factors)
  - Immigration, changes in educational attainment/job qualifications, changes in non-wage benefits of jobs and changes in alternative employment opportunities
- Wage determination – determined by market forces of demand and supply
- Wage differentials – explained by differences in demand, supply, PED and PES,
  - Workers are X homogenous; jobs are X homogenous
- Wage differentials – exist because of government intervention (minimum wage), labour market imperfection, or for non-economic reasons (e.g. discrimination)

### Appendix 1 – Price Elasticity of Demand along a Linear Demand Curve

A straight-line demand curve has a different elasticity at each point on it. The only exceptions are a vertical demand curve ( $PED = 0$ ) and a horizontal demand curve ( $PED = \infty$ ). The reason for this differing elasticity can be demonstrated using the equation for a straight-line demand curve:

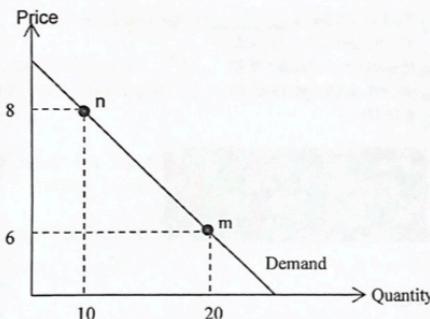
$$Q = a - bP$$

The term ' $-b$ ' would give the slope of the demand curve if we were to plot  $Q$  on the vertical axis and  $P$  on the horizontal. Since we plot them the other way around, the term ' $b$ ' gives the inverse of the slope as plotted. The slope of the curve as plotted is given by  $\frac{dP}{dQ}$ ; the inverse of the slope is given by  $\frac{dQ}{dP} = -b$ .

**Note:**  
Many students are curious about what university level economics looks like. This appendix is a good taster of some of the math involved in university level economics.

The formula for price elasticity of demand (using the point elasticity method) is:

$$PED = \frac{dQ}{dP} \times \frac{P}{Q}$$



This can thus be rewritten as:

$$PED = -b \frac{P}{Q}$$

This is illustrated in the diagram, which plots the following demand curve:

$$Q = 50 - 5P$$

The slope of the demand curve  $\frac{dP}{dQ}$  is constant (i.e.  $\frac{8-6}{10-20} = \frac{2}{-10} = -0.2$ ). The inverse of the slope  $\frac{dQ}{dP}$  is thus  $-5$ . In this example, price elasticity of demand is given by:

$$PED = -5 \frac{P}{Q}$$

The value of  $\frac{P}{Q}$ , however, differs along the length of the demand curve. At point n,  $\frac{P}{Q} = \frac{8}{10}$ . Thus,

$$PED = -5 \left( \frac{8}{10} \right) = -4$$

At point m, however,  $\frac{P}{Q} = \frac{6}{20}$ . Thus,

$$PED = -5 \left( \frac{6}{20} \right) = -1.5$$

Source: Sloman, J. et.al (2015). Chapter 3.1 Elasticity

# UNIT 2 – PRICE MECHANISM I NOTES

## Lesson objectives

- Explain how the price mechanism allocates resources in a free market
- Identify the determinants of demand and supply, and explain how they influence demand & supply
- Explain and analyse how prices are determined by free market forces of demand and supply
- Apply demand and supply analysis in various markets

## 1. THE MARKET ECONOMY

### 1.1 THE MARKET SYSTEM – in a free market system (free of government intervention)

- Resources are allocated according to market forces of demand and supply
- Level of demand & supply of factor of production/final goods determines prices and quantities traded

#### Defining key terms

- Market – is where buyers and producers come together to transact goods/services
- Consumers of goods/services – households → consumption decisions → market forces of demand
- Producers of goods/services – firms → production decisions → market forces of supply

#### Characteristics necessary for efficient allocation of resources

→ perfect competition – is an essential feature of free market economy

- In perfect competition for each type of good/service, there are many buyers and sellers, each with an insignificant share of the market → result:
- No single buyer or seller is strong enough to control a market + exploit other sellers & buyers

→ rational behaviour and pursuit of self-interest

- Buyers & sellers behave rationally; economic activity (free-market system) driven by self-interests
- Producers/firms – maximise profits; consumers – maximise utility

→ freedom of choice and enterprise – all decisions made by households and firms

- **Consumer sovereignty** – consumers free to decide what to buy with their income
  - Exists when they influence the production decisions of the economy
- Firms free to choose what to sell and what production methods to use

→ private ownership of property

- Individuals have the right to own, control and dispose of land, capital and natural resources
- Owners of FOP have the right to income (rent, interests, profits) earned from the use of FOP

### 1.2 THE PRICE MECHANISM

is the invisible hand that allocates resources based on self-interest of consumers and producers to result in the right mix of goods and services for society

- Operates in market economies where changes in price (due to changes in demand and/or supply) cause resources to move in and out of industries
- **Function** – guided by self-interests → household and firms interact in markets to determine:
  - What and how much to produce; How to produce; For whom to produce
- Answers – how to allocate scarce resources to produce goods/services

**Recall** – 3 different types of economic systems; 3 fundamental questions of resource allocation

### 1.3 OVERVIEW OF DEMAND-SUPPLY MODEL

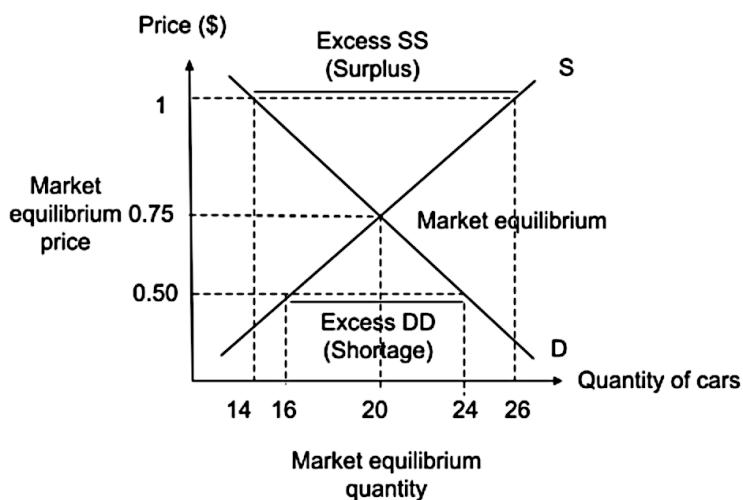
**Market equilibrium** is when buyers & sellers are on aggregate satisfied with current combination of price & quantity of goods bought/sold and are under no incentive to change their present economic activities

- Position of balance, no inherent tendency for change; achieved where demand intersects supply
- Quantity demanded = quantity supplied at equilibrium price level

**Equilibrium price** is the price at which the quantity demanded is equal to the quantity supplied

- Price at which the equilibrium quantity is traded → referred to as market clearing price
- Any other price where quantity demanded ≠ quantity supplied → market disequilibrium
  - Shortages or surpluses of good in the market

Price (\$)	QD	QS	Surplus/shortage	Price will...
1.25	8	28	Surplus	Fall
1.00	14	26	Surplus	Fall
0.75	20	20	None	Remain unchanged
0.50	24	16	Shortage	Rise
0.25	32	12	Shortage	Rise



Why is there only one point?

- Surplus – producers lower prices, QD increases, suppliers produce less
- Shortage (scarcity) – consumers recognize shortage, offer to buy at higher prices, producers sell at higher prices
- Will reach one point of market equilibrium eventually

### Market adjustment process – affected by changes in market demand and supply

- Changes in market demand or supply → equilibrium price & quantity change (in real world) → trigger market adjustment process → cause price to change to new equilibrium where  $QD = QS$
- 2 types of triggers: 1. Producer triggers (want to sell → lower prices); 2. Consumer triggers (recognize shortage → willing to purchase at higher prices → producers raise prices)

#### → surplus in the market – prices above equilibrium price

- Since quantity supplied exceeds quantity demanded → surplus → downward pressure on price
- To sell their surplus, producers begin lowering prices. As price falls:
- As price falls, consumers are willing and able to buy more →  $Q_D$  increases
- As price falls, producers are less incentivised to produce due to fall in profitability →  $Q_S$  decreases
- Fall in price continues until equilibrium price (state) is reached,  $QD$  is equal to  $QS$  at (*specify units*)

#### → shortages in the market – prices below equilibrium price

- Since  $QD$  exceeds  $QS$  → shortage in market → consumers unable to purchase all they like
- Upward pressure on price as consumers try to outbid one another for existing supplies
- As price increases, producers are incentivised to produce due to increase in profitability ( $QS$  increase)
- Consumers less able and willing to buy due to increase in price →  $QD$  falls
- Increase in price continues until equilibrium price (state) is reached, where  $QD$  is equal to  $QS$  at (units)

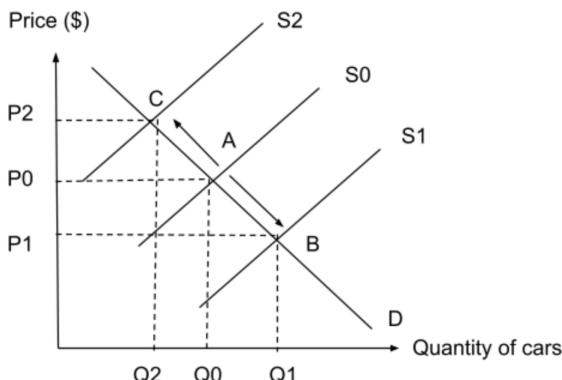
## 2. DEMAND THEORY

**DEMAND** for a commodity refers to the amount that consumers are willing and able to purchase at every given price over a given period of time

- **Effective demand** is when the willingness to pay is supported by the ability to pay
- E.g. children want to buy toys → X constitute effective demand; ✓ parents are

**2.1 LAW OF DEMAND** states that quantity demanded of a good/service is inversely related to price, ceteris paribus (i.e. lower price of good, greater quantity demanded and vice versa)

- Graphically – movement along the downward-sloping demand curve, caused by shifts in supply curve



### Demand curve

- Note – demand refers to the entire line quantity demanded is a point on the curve that changes

→ **Individual demand curves** are graphical representations of the relationship between the price of a good and its quantity demanded, ceteris paribus

- Shows the amount of a good a consumer is able and willing to purchase at each given price over a given period of time

**Features of individual demand curves** – **downward sloping** due to the **Law of Diminishing Marginal Utility**

- Inverse relationship between price of the goods and quantity demanded, ceteris paribus
- LDMU – beyond a certain point of consumption, each extra unit consumed gives less additional utility than previous units
  - Individual demand curve of good X indicates decreasing marginal utility consumers derive from consuming each additional unit of the good

### Marginalist Principle on demand curves

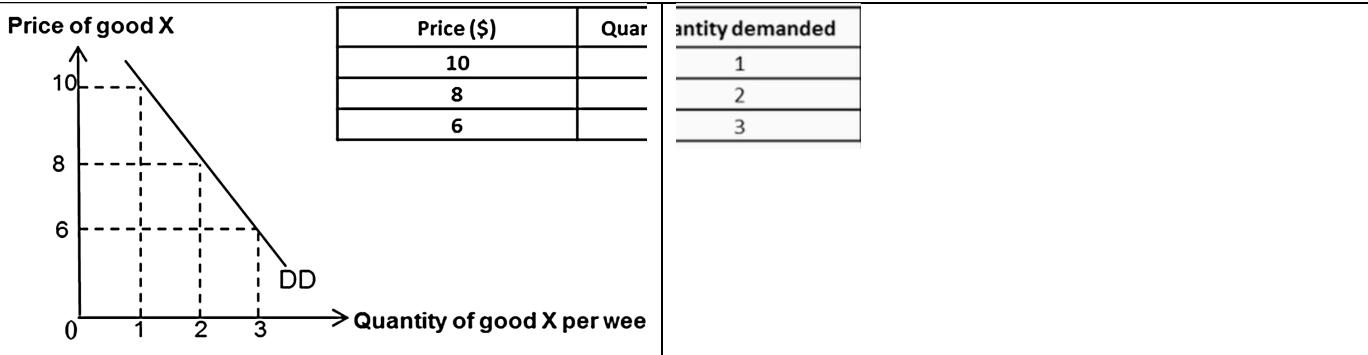
- Marginal utility that a consumer derives from consuming an additional unit of a good is important in determining how much he/she is willing to pay
- Consumers experience diminishing marginal utility in consuming additional units of good X (LDMU)
- In maximising utility with given budget, rational consumers apply Marginalist Principle in deciding how many units of good X to purchase (increase quantity demand as price decreases, vice versa)

### Rational decision-making [consumers]

- Consumer should purchase an additional unit of good X if its marginal utility ≥ price
  - Consumer is better-off → able to derive utility which exceeds the amount he has spent
- Consumer should not purchase an additional unity of good X if marginal utility < price
  - Consumer A is worse-off → amount spent exceeds utility derived from consuming the good

### Interpreting individual demand curves

- Consumer derives \$10 equivalent of utility from consuming 1<sup>st</sup> unit of X, \$8 from 2<sup>nd</sup>, \$6 from 3<sup>rd</sup>
- Marginal utility of consuming additional units of X decreases due to LDMU



→ **Market demand curves** are the horizontal summation of all individuals' demand curves

- Downward sloping due to the Law of Demand

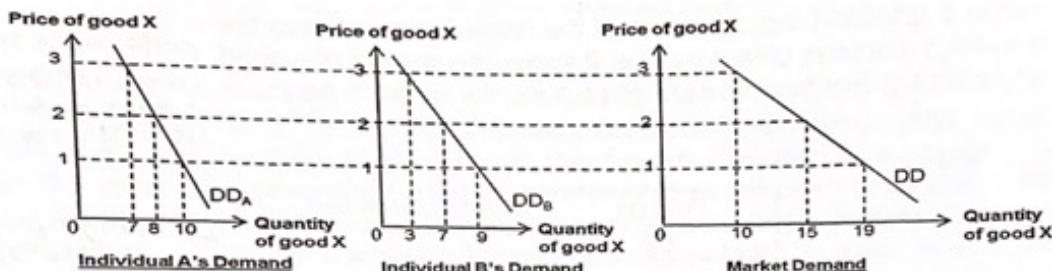
Two reasons for the Law of Demand

1. **Substitution effect** – effect of a change in price of good on its quantity demanded arising from consumers switching to, or from, alternative products, ceteris paribus

- Example – increase in price of strawberries leads to it being replaced by a substitute (e.g. grapes)
- Thus, substitution effect causes consumers to buy less (more) of a product when the price of the product increases (decreases)

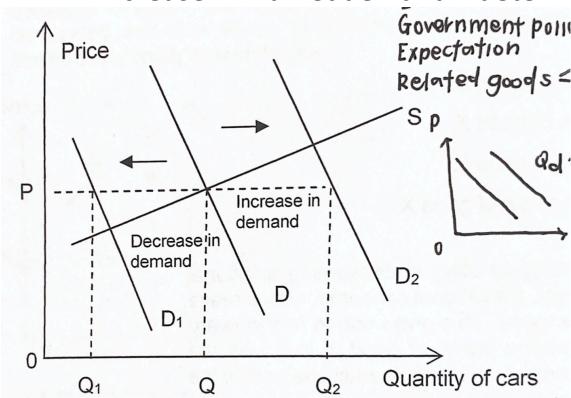
2. **Income effect** – occurs when a change in price of the good affects consumers' real income or purchasing power, which in turn affects consumers' ability to buy the good

- Example – increase in price of strawberries will lead to a fall in real income, ceteris paribus
- When consumers' purchasing power falls, ability + willingness to buy strawberries fall → buy less



## 2.3 FACTORS INFLUENCING MARKET DEMAND

- Determine the position of demand curve (change in non-price determinants of demand changes quantity consumers are willing + able to purchase at any given price)
- Represented by shift of demand curve (results in movement along supply curve)
  - Any change in demand results in changes in equilibrium price & quantity of good
- Fall in market demand – determinant lowers QD at every price; shift of demand curve to the left
- Increase in market demand – determinant raises QD at every price; shift of demand curve to the right

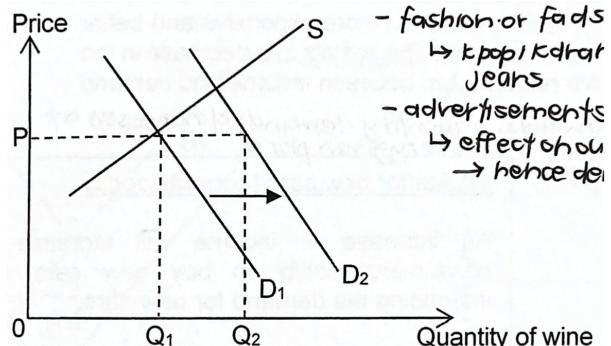


## → Taste and Preferences – influences consumers' desired purchases + willingness to purchase a good

- Factors affecting taste – effects of advertisements, education, culture and age group
- Change in taste → likely to increase demand for good → demand curve shift to right, vice versa

### Examples

- Temporary increases in demand for merchandise due to fads – latest craze like K-pop and K-dramas
- Permanent decreases in demand for CD players due to new inventions + improved products (iPads)



- fashion or fads  
↳ kpop/kdrama jeans

- advertisements  
↳ effect on you → hence do

Discovery (British Medical Association) that people who drink regularly live longer, healthier lives

- Discovery raises demand for wine
- Consumers more willing to purchase a greater quantity of wine at every price
- Demand curve shifts rightwards ( $D_1$  to  $D_2$ )
- As the same price (OP), quantity demanded increases from  $OQ_1$  to  $OQ_2$

## → Seasonal changes/climatic changes (sub-set of taste and preferences) – examples

### Hot season – demand for air conditions/fans increases

- Hot weather – increases consumers' willingness to purchase ^ (keep cool); curve shifts rightwards
- Cold weather – demand for winter clothes increases

### Festivals – Chinese New Year, Hari Raya, Valentines' Day

- CNY & HR – increase in demand for eggs, flour, new clothes
- VD – increase in demand for flowers and restaurant meals

## → Expectations of future prices – if consumers expect good's prices to

- Rise in future (ceteris paribus): demand for good increase now; rightward shift of demand curve
- Fall in future: postpone consumption of good + fall in demand for good in current period; leftward shift of demand curve

E.g. Buy toilet paper/masks during CB → demand curve shifts right (self-fulfilling prophecy) → price increases

### → Income – changes in income affect consumers' ability to purchase goods and services

- Increase in income – consumers have more to spent in total, increases ability to purchase more goods and services → readjustments of consumers' expenditure patterns
- Increase demand for some goods, decreases demand for other goods
  - Depends on whether goods are normal goods or inferior goods

### Normal goods – are goods when the demand for it increases in response to an increase in consumer income

- Demand for good varies directly with income (e.g. credit card, country club membership)
- Most goods are normal goods – increase in income, rise in demand, shifts demand curve to right
  - **Positive relationship** between income and demand – QD increases at every price

### Inferior goods – are goods where the demand falls as consumers' incomes increases

- Often regarded as cheap but inferior substitutes for other goods
- As income increases, consumers experience increased ability to buy → tend to switch to more expensive and better-quality substitutes → decrease in demand for inferior goods → curve shifts left
  - **Negative relationship** between income and demand for inferior goods
- E.g. second-hand clothes/second-hand cars vs new clothes/branded clothes/new cars

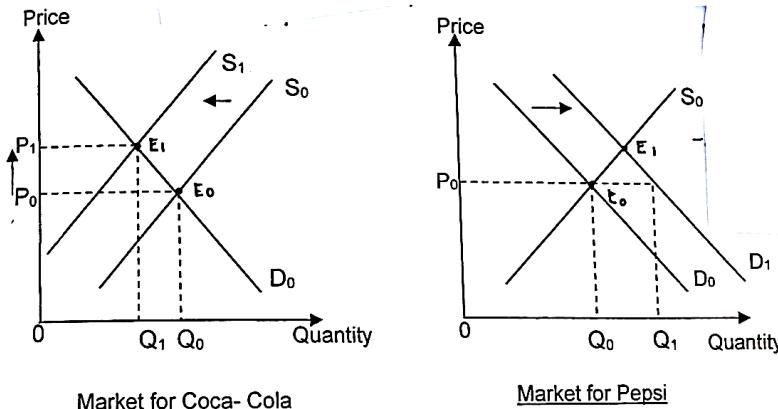
<p><u>Market for new cars (normal goods)</u></p> <ul style="list-style-type: none"> <li>• Increase in income, increase consumers' ability to buy new cars, increases demand</li> <li>• Demand curve shift to right from <math>D_0</math> to <math>D_1</math></li> <li>• At same price <math>O P</math>, QD increases from <math>OQ_0</math> to <math>OQ_1</math></li> </ul>	<p><u>Market for second-hand cars (inferior goods)</u></p> <ul style="list-style-type: none"> <li>• Increase in income, increased consumers' ability to purchase new cars, consumers tend to switch away from purchasing second-hand cars, decrease in demand</li> <li>• Demand curve shift left from <math>D_0</math> to <math>D_1</math></li> <li>• At same price <math>O P</math>, QD decreases from <math>OQ_0</math> to <math>OQ_1</math></li> </ul>

#### → Prices of Related Good – demand for good/service change as a result of change in price of related good

- Can either be substitutes or complements

Substitutes – are commodities that can be **used in place** of another

- Satisfies the same want → in **competitive demand**
- Increase in price of good A results in rise of demand for substitute (good B)
  - Price of good A increase, some consumers switch to good B, increase in demand for B
- Examples – Coca-Cola & Pepsi, MRT & taxi services, Cadbury & Nestle chocolates, milk & yoghurt

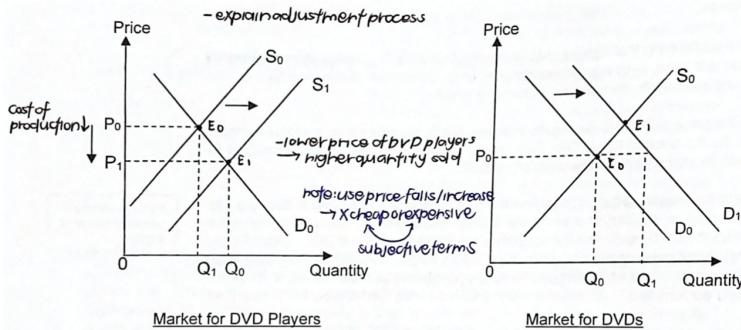


#### Answering techniques

- Rise in cost of production led to fall in supply of C → result in rise in price of C
- Supply curve (C) shifts left from  $S_0$  to  $S_1$ , quantity traded falls from  $OQ_0$  to  $OQ_1$
- As C is now relatively more expensive as compared to P, people shift their consumption to P
- Demand for P increases, demand curve for P shifts right from  $D_0$  to  $D_1$
- At same price  $O P$ , quantity demanded increases from  $OQ_0$  to  $OQ_1$

Complements – are goods that are **used in conjunction** with one another

- Jointly demanded to satisfy the same want → in **joint demand**
- Fall in price of good A leads to increase in demand for good B
- Due to fall in price of A resulting in larger quantity of A being purchased, increase in demand for B
- E.g. tea & sugar, car & petrol, camera & memory card, blue-ray DVDs & players, computer & software



### Answering techniques

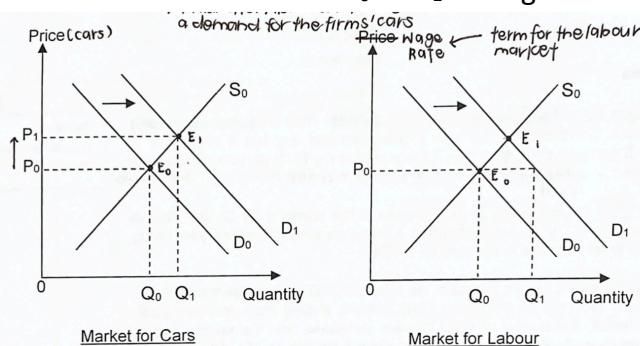
- Price D players fall ( $OP_0$  to  $OP_1$ ) due to reduction in cost of production (technology advancement)
- Supply of D players increase, supply curve shifts to right from  $S_0$  to  $S_1$
- Decrease in price from  $OP_0$  to  $OP_1$ , quantity traded for D players increases from  $OQ_0$  to  $OQ_1$
- As more D players are consumed, demand for D (complementary good) increases, demand curve shifts right from  $D_0$  to  $D_1$
- At same price  $OP$ , quantity demanded increases from  $OQ_0$  to  $OQ_1$

→ **Derived demand** refers to demand for one good or service occurring as a result of the demand for another intermediate/final good or service

- Changes in final product market causes demand for factor resources to change because demand for factors of production (FOP) is derived from demand for final goods and services

Example – production of cars requiring use of labour

- Increase in demand for cars, increase revenue firms obtain from selling cars produced by labour
- Firms more willing to hire more workers to increase car production, demand for labour increases
  - Demand for labour is a derived demand
- Demand for cars and labour both increase from  $D_0$  to  $D_1$  in diagrams below



Note – do not confuse complements with FOP; go back to term definitions to clarify confusion

- Complements – goods used in conjunction to fulfil a want
- FOP – resources/intermediate goods used to produce a final good

### → Government policies

Direct tax policy – is a tax on people's income

- Changes in direct tax rates affect people's disposable income
  - Disposable income – income available for spending after payment of income tax
- Increase in income tax reduces people's disposable income, reduces their ability to pay, lead to decrease in demand for normal goods and services, and vice versa

Direct subsidy policy – direct subsidies are payments made by the government to consumers

- Increase consumers' ability to pay and demand

**Examples** – Housing grants; Edusave grants for primary school to junior college students

- Housing grants encourage married couples to stay near their parents → increase demand for housing in areas near where their parents are staying

→ **Population** – change in demographics affects demand for certain goods & services

- Affects number of potential consumers or the size of market

- Changes due to an absolute increase/decrease in total population or change in composition/demographics of population

Example – a change in age distribution due to

- Baby boom – increased demand for baby products (short-run effect), schools, housing, etc. (long-run)
- Ageing population – increased demand for healthcare services

→ **Interest rates** – rate of interest is the price of borrowing money

- Changes in rate of interest affect level of demand by consumers (esp if rely on loans/hire purchases)
- Note – interest rates affect savings → how will an increase in interest affect savings?

Example – increase in interest rate reduces demand for cars

- Why? cost of purchase (in monthly payments) increases even though price of cars stays the same
- Demand curve for cars shift leftwards

→ **Exchange rates (macro-economic)** – rate at which a country's currency exchanges for another currency

- Changes in rate of exchange affects foreign demand for a country's goods and services

Example – S\$ appreciates (strengthens) against the US\$, ceteris paribus

- Exchange rate of S\$1 = US\$0.70; S\$100 export from SG sold in US for \$70 → SG appreciates to S\$1 = US\$0.85, same good sold for US\$85
- SG goods sold to USA (exports) become **relatively more expensive** in US\$ compared to US substitute
- Consumers switch to buying US goods, leading to increase in demand for US goods

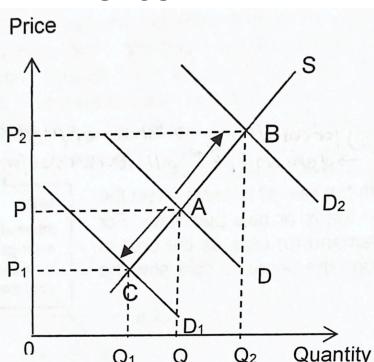
### SECTION SUMMARY

- Demand for a good/service refers to the quantity of good/service that consumers are willing & able to purchase at every given price over a period of time
- Demand curve is downward sloping as price and quantity demanded are inversely related
  - LDMU influences individual demand curve; Law of Demand influences market demand curve
- List of non-price determinants of demand is non-exhaustive & not applicable to every market
  - More significant determinants: tastes & preferences, income, expectation of future prices
- Change in any non-price determinants of demand, ceteris paribus, leads to change in demand, entire demand curve shifts

## 3. SUPPLY THEORY

**SUPPLY** of a good or service refers to the quantity of a good or service that producers are willing and able to offer for sale at each given price over a given period of time, ceteris paribus.

### 3.1 LAW OF SUPPLY



- Quantity supplied of a commodity over a period of time, is directly related to price of a product
- The higher the price of a good, the greater the quantity supplied, and vice versa, ceteris paribus
- Graphically – represented as a movement along the upward-sloping supply curve
  - Movement along the curve is caused by shifts of the demand curve

**Supply curve** (of a firm) is a graphical representation of the relationship between price of a good and quantity supplied by a firm over a given period of time, ceteris paribus

- Shows amount of good producers are able & willing to sell at each given price over a period of time
  - Law of diminishing marginal returns** state that beyond a certain point of production, adding an additional factor of production results in smaller increases in output

Features of supply curves

- Upward sloping firm supply curve**
  - Why? higher price required to incentivise firms to increase QS (to maximise profits)
- SS curve indicates increasing marginal costs incurred from producing each additional unit of good

### Marginalist Principle on supply curves

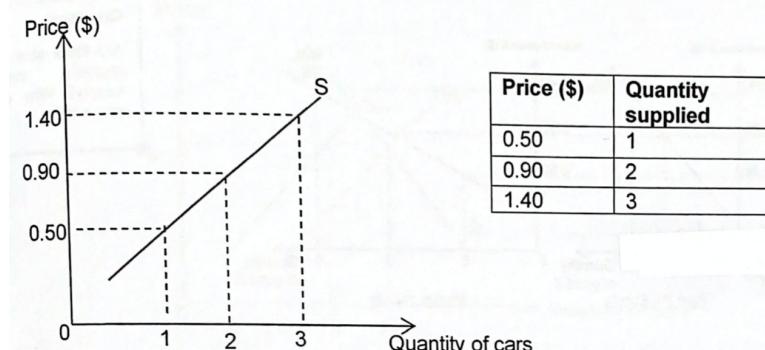
- **Marginal cost** incurred from producing an additional unit of good is important in determining how much producer is willing to accept for producing it (price)
- Producer experiences diminishing marginal returns in producing additional units of good X
- In maximising profits, rational producers apply Marginalist Principle in deciding how many units of good X to produce (will only supply if revenue  $\geq$  cost of production)
  - Rational producer will increase quantity supplied as price increases, and vice versa

### Rational decision-making [producers]

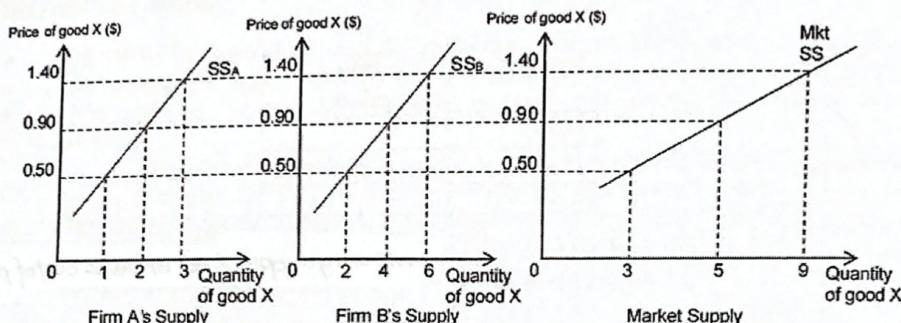
- Producer should produce additional unit of good X if price  $\geq$  marginal cost of production
  - Producer is better-off, profits increase
- Producer should not produce an additional unit of good X if price < marginal cost of production
  - Producer is worse-off, profits decrease

### Interpreting individual demand curves

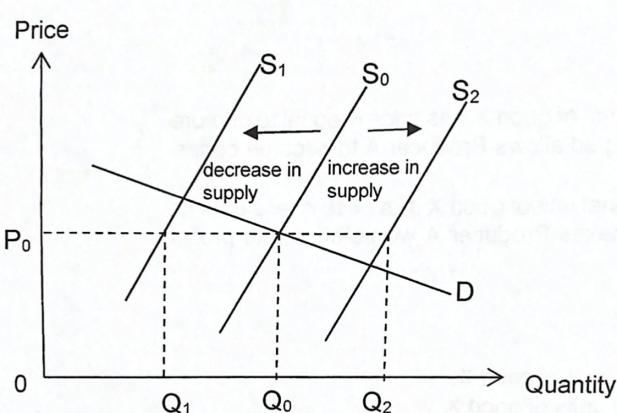
- Producer incurs \$0.50 from producing 1<sup>st</sup> unit X; \$0.90 from 2<sup>nd</sup> unit; \$1.40 from 3<sup>rd</sup> unit
- Producer should produce 3 units of X – constitutes the firm supply curve of good X



### Market supply is the horizontal summation of firms' supply curves

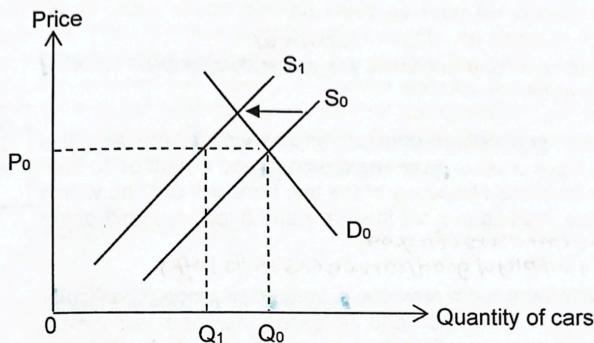


### 3.2 FACTORS INFLUENCING MARKET SUPPLY – non-price determinants of supply



- Change in non-price determinants of supply changes quantity producers are willing and able to sell at every given price (represented by shift in supply curve)
  - Note – shift of supply curve causes movement along the demand curve
- Fall in market supply – determinant lowers QS at every price; shift in supply curve to left
- Increase in market supply – determinant increases QS at every price; shift in supply curve to right

## → Cost of production/prices of factors of production



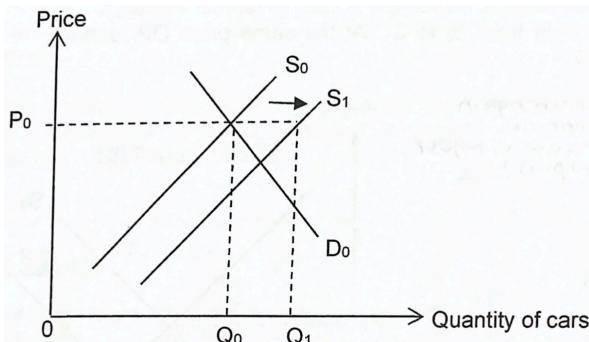
- Change in cost of production → cause change in level of profits → affect supply of goods
- Factors affecting cost of production – change in price of factor of inputs (raw materials, fuel, power), cost of labour (wage rates), cost of capital

### Example – increase in price of steel

- Cost of production of cars rises, production less profitable, firms only willing to supply fewer cars at each and every price → supply of cars falls; supply curve shifts leftwards from  $S_0$  to  $S_1$
- At the same price  $P_0$ , quantity demanded decreases from  $OQ_0$  to  $OQ_1$

## → Innovation/State of technology – represents economy' stock of knowledge about how resources can be combined most efficiently (changes as a result of new discoveries and innovation)

- Productivity – measured by output per unit of input



Question – is technology change and productivity change more likely to happen in the long or short run?

### Impact of technological change on the supply of a good

- Improvements in techniques of production (due to new inventions/technological advances within industry) increases productivity of factors of production → each unit of a factor produces more
- With same factor price, **cost per unit of output will be lower**
- Producers are willing and able to supply more of good at each and every given price, increases supply of good, supply curve shift to the right from  $S_0$  to  $S_1$

## → Natural factors

- Favourable climatic conditions (abundant and reliable rainfall; absence of pests) increases agricultural products supply → shift supply curve to right (assuming no change in cost of production)
- Occurrence of natural disasters (droughts, floods, earthquakes, severe haze) reduces supply of agricultural products → leftward shift of supply curve

Question – how does this affect SG markets?

## → Government policies – on indirect taxation and subsidies affect COP of firms and hence supply

Indirect taxes – are taxes imposed on expenditure of goods and services

- Goods & Services Tax (GST) – levied on firms, added on to their COP
- Since cost increases due to tax, firms will only be willing and able to supply fewer goods at every price
- Fall in supply, leftward shift of supply curve

Indirect subsidy – is a payment made by the government to firms to produce a particular good

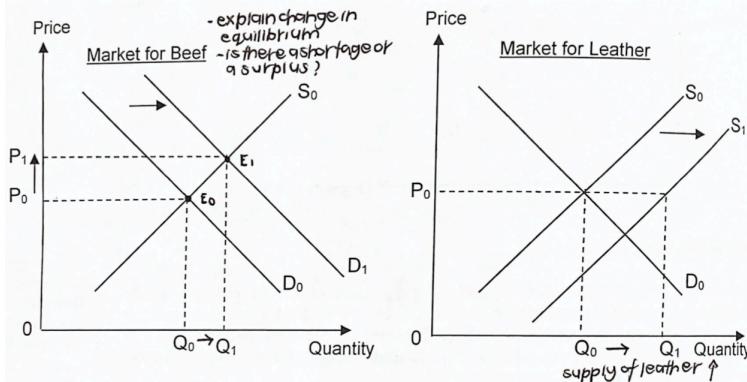
- Reduce firms' COP and increase firms' willingness and ability to supply more goods at every price
- Supply increases, rightward shift of supply curve

Question – what other examples can you think of?

## → Prices of related goods

Joint supply of two or more products refer to production of goods derived from a single product

- Not possible to produce more of one without producing more of the other
- Increase in price of one lead to increase in supply of other joint product
- Butter & skimmed milk from whole milk; petrol & diesel from crude oil; beef & leather from cattle

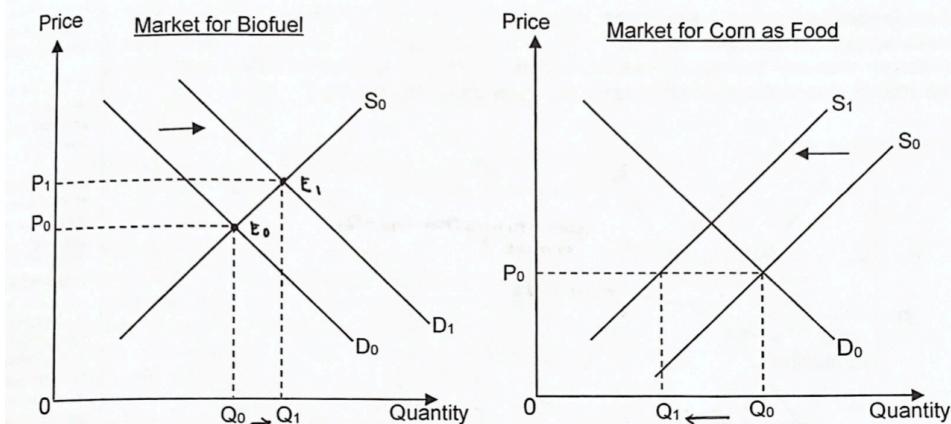


### Answering techniques

- Increase in demand for beef, demand curve shifts right from  $D_0$  to  $D_1$ , increase in price
- Producers encouraged to increase quantity supplied to  $OQ_1$ , increase in QS of beef results in more leather being offered for sale on the market
- Supply of leather increases, supply curve of leather shifts right from  $S_0$  to  $S_1$
- At same price  $OP$ , quantity supplied increases from  $OQ_0$  to  $OQ_1$

Competitive supply of two or more products refer to production of one or the other by a firm

- Goods compete for same use of same resources; producing more of A means producing less of others



### Answering techniques – corn for consumption vs for production of biofuel (in competitive supply)

- Increase in demand for biofuel, demand curve shifts right from  $D_0$  to  $D_1$ , price of biofuel increases from  $OP_0$  to  $OP_1$ , farmers choose to produce corn for biofuel production as it is more profitable
- Supply of corn for consumption decreases, supply curve for corn as food shifts left from  $S_0$  to  $S_1$
- At same price  $OP$ , quantity supplied decreases from  $OQ_0$  to  $OQ_1$  (profit maximization)

## → Expectations of future price changes

- Price expected to rise – producers temporarily reduce amount they sell in the market
  - Likely to build up stocks and only release them on the market when price rises
- At current prices, producers are willing to supply less than they otherwise would
  - Leftward shift of supply curve (opposite if producers expected prices to fall)

Question – do you think this applies to the 4 factors of production such as land and labour

### SECTION SUMMARY

- Supply of a good/service refers to the quantity of good/service that producers are willing and able to offer for sale at every given price over a given period of time
- Supply curve is upward sloping as price and quantity supplied is directly related according to Law of Supply
- Many non-price determinants of supply – more significant non-price determinants of supply include cost of production/prices of factors of production, innovation/state of technology, and government policies

## 4. DEMAND-SUPPLY THEORY

### 4.1 CHANGES IN DEMAND AND SUPPLY

- Equilibrium price and quantity is stable, X change until demand and/or supply conditions change
- **Market disequilibrium** – situation of having shortages/surpluses since  $Q_D \neq Q_S$ 
  - Market adjustment process occurs (refer to portion on top)

Why price is the invisible hand that allocates resources

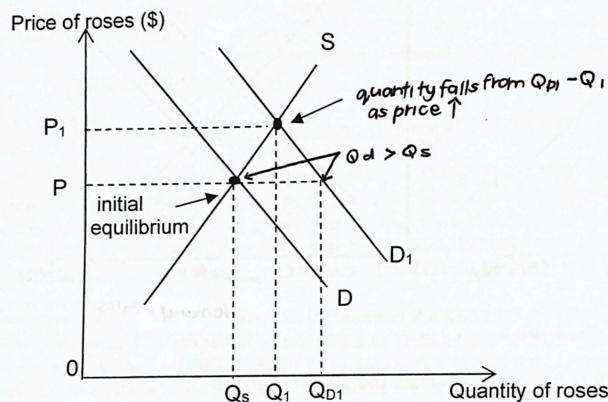
- Change in price → result in change in equilibrium quantity → amount of resources allocated to production of a good in the market

### IMPORTANT – 3-STEPS ANALYSIS

1. Decide whether demand or supply is affected given the scenario
2. Decide direction of shift in demand/supply curve + demand/supply factor causing the change
3. Explain how the market adjusts to new equilibrium price and quantity given shifts in DD & SS curves

Note – important to learn full explanation of market adjustment process (include Y and substitution effect)

### → effect of demand shifts on equilibrium price and quantity



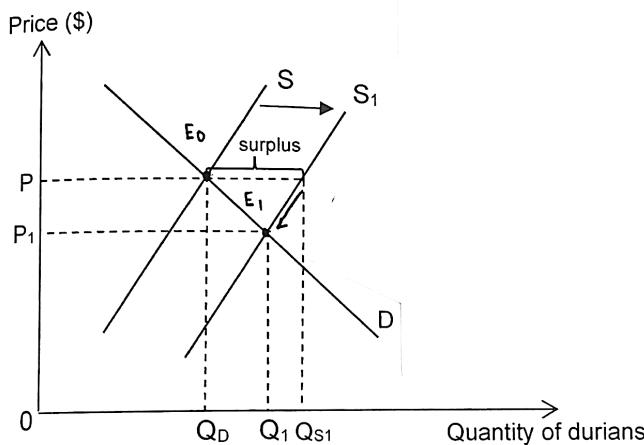
- Demand increase – shortage created at initial equilibrium price
  - Current equilibrium quantity insufficient, price adjusts upwards to reach new  $P_E$  and  $Q_E$
- Demand falls – surplus created
  - Price adjusts downwards to reach new  $P_E$  and  $Q_E$

### Answering techniques – Valentine's Day

- Greater willingness to buy roses, increase in seasonal demand for roses, rightward shift in demand curve from  $D_0$  to  $D_1$
- Increase in quantity demanded at every given price level, ceteris paribus, shortage of  $Q_{D1} - Q_S$  at original price  $O_P$  →  $Q_D$  exceeds  $Q_S$
- Upward pressure on price as consumers try to outbid one another for limited quantity of good
- As price rises, more profitable for firms to increase amount of roses supplied, while consumers' willingness and ability to purchase roses fall due to income and substitution effect
- $Q_S$  increases while  $Q_D$  falls until shortage is eliminated
- New equilibrium price is reached at  $O_P_1$  and equilibrium quantity increases to  $OQ_1$

In contrast, decrease in demand will lower  $P_E$  and  $Q_E$ , ceteris paribus

### → effect of supply shifts on equilibrium price and quantity



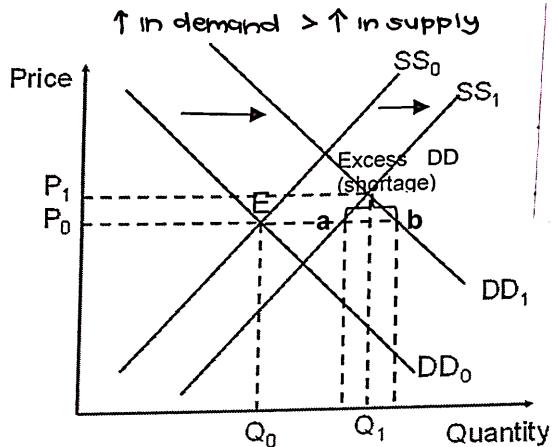
- Supply increase – surplus created at prevailing price; represented by rightward shift in supply curve
  - $Q_S$  is greater than  $Q_D$ ; to eliminate surplus, firms reduce their price, exerting a downward pressure on market price
- Supply falls – shortage created; represented by leftward shift in supply curve
  - Price adjusts upwards to reach a new equilibrium price and quantity

Answering techniques – harvest of durians increases due to favourable weather conditions in M'sia

- Supply of durians increases, rightward shift in supply curve from  $S_0$  to  $S_1$
- Increase in quantity supplied at every given price level, ceteris paribus
- Surplus of  $Q_{S1} - Q_d$  occurs at original price  $OP$  →  $QS$  exceeds  $QD$  → downward pressure on price as producers offer lower prices to sell surplus
- As price falls, more consumers are more willing and able to buy more durians due to income and substitution effect ( $QD$  increases) while producers are less willing and able to produce more durians due to decrease in profitability ( $QS$  decreases)
- $QS$  decreases until surplus is eliminated, new  $P_E$  falls to  $OP_1$  and new  $Q_E$  increases to  $OQ_1$

In contrast, decrease in supply will result in a lower  $Q_E$  but higher  $P_E$ , ceteris paribus

### → effects of simultaneous shifts in demand and supply



- Likely for both to shift simultaneously in a dynamic world; Given simultaneous shifts, final effects on EP and EQ depends on relative magnitude of change in demand and supply

Increase in both demand and supply – effect on market is indeterminate

- Increase in DD – increasing preference for smartphone
- Increase in SS – technological improvements allowed smartphones to be produced at a lower cost

Answering techniques

- Although new equilibrium point will be to the right of E, new price could be above or below  $P_0$ , depending on relative shifts of demand and supply curves
- EQ rises; EP indeterminate (depends on relative shifts of DD & SS curves)
- Possible scenarios:  $DD > SS$ ,  $DD = SS$ ,  $DD < SS$

**Increase in DD > increase in SS** (reflected by larger extent shift in DD curve from  $DD_0$  to  $DD_1$  than shift in SS curve from  $SS_0$  to  $SS_1$ )

- At initial equilibrium price  $P_0$ , shortage (ab) will occur → upward pressure on price as consumers try to outbid one another for existing supplies
- As price rises, more profitable for firms to increase output,  $QS$  increases, upward movement of along new supply curve  $SS_1$
- At higher prices, consumers' have less ability and willingness to pay as substitutes become relatively cheaper and disposable income falls (Y and substitution effect), fall in  $QD$ , upward movement along new demand curve  $DD_1$
- Process continues until shortage is eliminated
- At new equilibrium, price risen to  $OP_1$ , quantity increased to  $OQ_1$

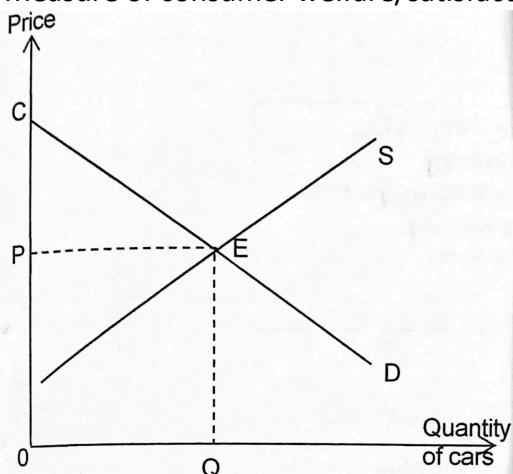
### SECTION SUMMARY

- Changes in demand and supply put the market in disequilibrium, and prices adjust to return markets to a state of equilibrium (i.e. market adjustment process)

## 5. ECONOMIC WELFARE

**5.1 CONSUMERS' SURPLUS** is the difference between the maximum amount consumers are willing and able to pay for a given quantity of a good and what they actually pay

- Measure of consumer welfare/satisfaction



- DD curve for a particular good – CD
- Market price (OP), QD (0Q)

Total amount consumers pay for 0Q units

- Price x quantity (total expenditure), OPEQ

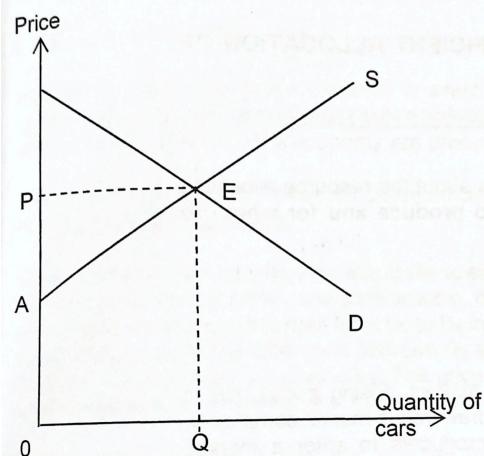
Amount consumers are willing to pay for 0Q units

- OCEQ, area under DD curve up to level of quantity consumed (0Q)
- Value of total satisfaction/benefits from consuming 0Q units

**Consumer surplus**

- Total satisfaction/benefits consumers receive from buying 0Q units – amount paid for 0Q units
- OCEQ – OPEQ = CPE (area above price line and below DD curve up to output 0Q)

**5.2 PRODUCERS' SURPLUS** refers to the difference between amount received by producers for selling their goods and the minimum price they are willing and able to accept for supplying additional units of the good



- Market price (OP), QS (0Q)

At OP, total amount producers received for 0Q units

- Price x quantity, OPEQ

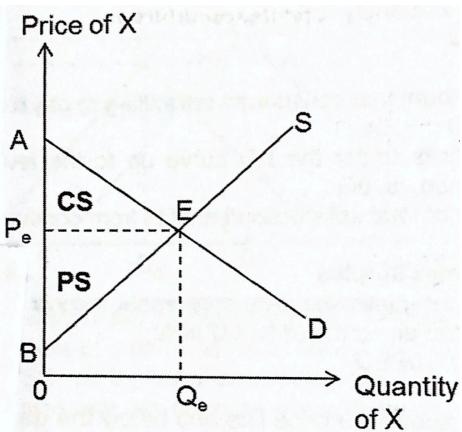
Minimum amount producers are willing to accept for 0Q units

- OAEQ, area below SS curve up to QS at OP (0Q)

**Producer surplus**

- OPEQ – OAEQ = APE
- Area above SS curve and below price line up to last unit produced (0Q)

**5.3 SOCIETY'S WELFARE** is the sum of consumers' and producers' surplus



At equilibrium  $Q_E$ ,

- Societal welfare = consumer surplus + producer surplus
- $P_eAE + P_eBE = ABE$

**Significance of concepts of consumers' and producers' surplus**

- Society maximises total economic welfare and achieve economic efficiency when
  - Sum of consumers' and producers' surpluses is maximised at market equilibrium point
- Factors that have welfare effects on society
  - Free market decisions/actions of firms, households and government intervention
  - Measured in terms of gains and losses in consumers' and producers' surpluses

### Note

- Transfers between CS and PS; from an economic standpoint, sum of welfare X change → X a problem
- When CS and PS is at a maximum, allocative efficiency is achieved by society

## **6. ROLE OF PRICE MECHANISM IN EFFICIENT ALLOCATION OF RESOURCES IN FREE MARKET**

### **6.1 FUNCTIONS OF THE PRICE MECHANISM**

- Condition of **scarcity** forces societies to make choices about **resources allocation**

Price mechanism address resource allocation question of:

- What and how much to produce – answered when
  - Firms **produce** only goods consumers are willing and able to buy
  - Consumers **buy** only goods producers are willing and able to buy
- How to produce
  - Answered because for given resource prices, firms will use the **best combination of resources** to produce a given output at the lowest possible average cost
- For whom to produce
  - Consumers' dollar votes determine **what is produced** and **what consumers can buy**
  - Those with more money will be able to consume more of the goods produced, answers the 'for whom to produce' question of resource allocation under the price mechanism

Price mechanism has **3 main functions** in the free market

→ **Signalling (allocative function)** – price communicate information to decision-makers

- Rising prices – signal to consumers to cut back on buying or withdraw from a market completely
- Higher prices – signal to potential producers to enter a market

How the signalling function performs the resource allocation function (of the price mechanism)

- Resources move or reallocate to different industries due to the signalling function
- Signalling function is associated with changes in demand and supply

→ **Rationing (distributive) function** – how rationing function helps allocate scarce resources

- Prices ration the good/resource to consumers/producers who are willing and able to pay for it
- Shortage – market price increases, effect is to discourage consumption + conserve resources
  - Consumers/producers unwilling and/or unable to pay for the good/resource will be rationed out of the market

→ **Incentive function** – incentive motivates a consumer or producer to change his behaviour

- Higher market prices – motivate existing producers to increase output
  - Due to possibility of more revenue and higher profits (assuming firms maximise profits)
- Fall in price of good – provide an incentive to consumers to increase QD of good
  - Why? to maximise utility

### **6.2 HOW PRICE MECHANISM ACHIEVES ECONOMIC EFFICIENCY**

**Economic efficiency** broadly means the best possible use of resources and it exists when both allocative and productive efficiencies are achieved in an economy

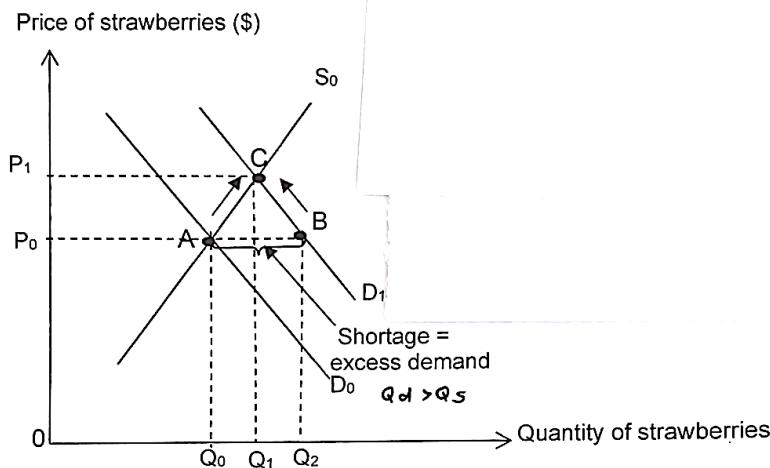
→ **Allocative efficiency** is the situation in which society produces and consumes a combination of goods and services that maximises its welfare.

- Achieved when goods and services wanted by the economy are produced in the right quantities
- Price mechanism achieves this by clearing shortages/surpluses in market through signalling

Answering techniques – price of strawberries

- Consumers decide to eat more strawberries because of its health benefits (change in taste & preferences), demand for strawberries increases and demand curve shifts right from  $D_0$  to  $D_1$
- At initial price,  $OP_0$ , there is a shortage equal to difference between  $Q_2$  and  $Q_0$
- Signalling (p) – price of strawberries rises, which **signals** to producers that a shortage in strawberry market has emerged
- Incentive (p) – increase in price is an **incentive** for producers to increase QS of strawberries, at higher price, strawberry production is more profitable, producers move along supply curve from point A to point C, increasing QS
- Signalling (c) – however, higher prices is a **disincentive** for consumers, signals that strawberries are more expensive. Being utility maximisers, they would buy fewer strawberries, move along new demand curve from point B to point C, buying fewer strawberries than at original price  $OP_0$

- Process of price adjustment stops when QD is equal to QS at new equilibrium  $OP_1$  and  $OQ_1$
- Rationing function – increase in price of strawberries resulted in reallocation of resources as indicated by increase in QS of strawberries, more resources allocated to strawberry production
- Market is at equilibrium and allocative efficiency is achieved (what and how much to produce)
- With the increase in price of strawberries, consumers with more money are able to consume more of the strawberries produced (for whom to produce)



→ **Productive efficiency** is achieved when all resources are fully and efficiently utilised

When all industries achieve productive efficiency,

- Firms are using the least cost method of production
- Economy produces on its production possibility frontier where it is impossible to produce more of one good without producing less of another

How price mechanism achieves productive efficiency in competitive markets

- Adjustment of factor prices in factor markets act as **signals** and **incentives** for producers to adjust their production methods in deciding how to produce with the least cost method of production
- Example – capital becomes relatively more expensive, firms adjust production methods to replace capital with more labour to reduce cost of production

**How desirable is the free market equilibrium?**

- Success of competitive market in achieving allocative and productive efficiency → price mechanism works well on its own → should not have government intervention in markets

Why government intervention is warranted

**1. Efficiency is achieved under various very strict conditions that are unlikely/difficult to meet in real world**

- Strict conditions – perfectly competitive markets, absence of externalities and public goods
- Real world – markets may fail in achieving allocative and productive efficiency → important justification for government intervention

**2. Competitive market is unable to provide a satisfactory answer to 'for whom to produce'**

- Those with more dollar votes consume more of the goods produced, result in unfair distribution of goods → wealthy consume a disproportionately large share of what is produced → invites government intervention

#### SECTION SUMMARY

- Price mechanism achieves allocative efficiency by clearing shortages/surpluses in market through signalling
- Price mechanism allows productive efficiency to be achieved in competitive markets as adjustment of factor prices in factor markets act as signals and incentives for producers to adjust their production methods

## 7. APPENDIX A

### 7.1 INCREASE IN BOTH DEMAND AND SUPPLY – effect on market equilibrium price is indeterminate

- Demand increase – rising incomes; supply increase – increase in productivity
- New equilibrium point: new price above or below  $P_0$  depending on relative shifts of DD and SS curve

Case 1: DD > SS Price increases Quantity increases	Case 2: DD < SS Price decreases Quantity increases

### 7.2 DECREASE IN BOTH DEMAND AND SUPPLY – effect on market equilibrium price is indeterminate

- Demand fall – leftward shift of DD curve; supply falls – rising business costs
- Combination of leftward shifts in DD and SS curve causes quantity exchanged in market to decline

Case 1: DD > SS Price decreases Quantity decreases	Case 2: DD < SS Price Increases Quantity decreases

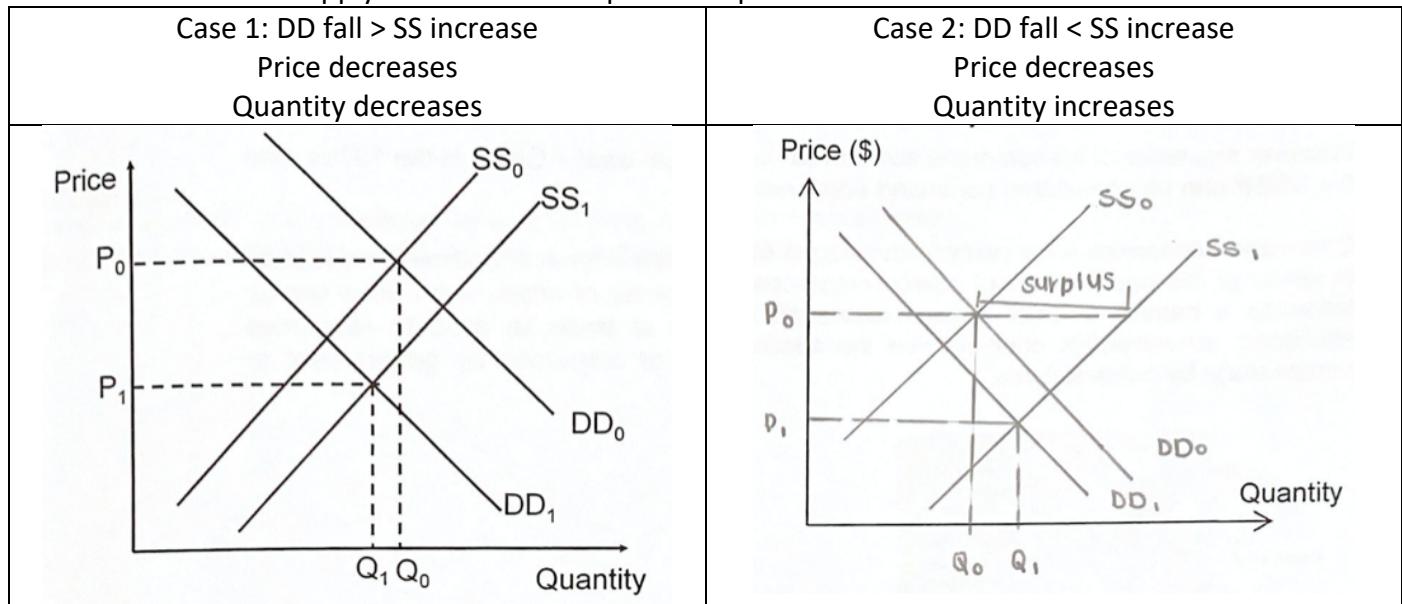
### 7.3 INCREASE IN DEMAND, DECREASE IN SUPPLY – market equilibrium quantity indeterminate

- Cause market equilibrium price rises, changes reinforce each other, leading to a higher price
- Increase in demand – rising incomes; decrease in supply – increasing cost of production

Case 1: DD increase > SS fall Price Increases Quantity Increases	Case 2: DD increase < SS fall Price Increases Quantity decreases

## 7.4 DECREASE IN DEMAND, INCREASE IN SUPPLY – market equilibrium quantity exchanged indeterminate

- Demand fall + supply increase cause equilibrium prices to fall



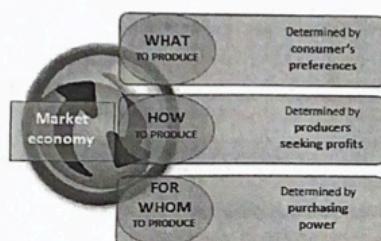
## **8. APPENDIX B**

### **Appendix B – Economic Systems**

*There are two basic solutions to the economic problem as described by Paul Samuelson, namely free markets and central planning.*

#### **Free market economies**

Markets enable mutually beneficial exchange between producers and consumers, and systems that rely on markets to solve the economic problem are called market economies. In a free market economy, resources are allocated through the interaction of free and self-directed market forces. This means that what to produce is determined by consumers, how to produce is determined by producers, and who gets the products depends upon the purchasing power of consumers. Market economies work by allowing the direct interaction of consumers and producers who are pursuing their own self-interest. The pursuit of self-interest is at the heart of free market economics.

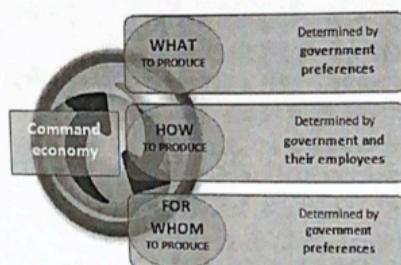


#### **Command economies**

The second solution to the economic problem is the allocation of scarce resources by government, or an agency appointed by the government. This method is referred to as central planning, and economies that exclusively use central planning are called command economies. In other words governments direct or command resources to be used in particular ways. For example, governments can force citizens to pay taxes and decide how many roads or hospitals are built.

However examples of full command economies no longer exist – China in the 1970s, and the USSR can be considered command economies.

Command economies have certain advantages over free market economies, especially in terms of the coordination of scarce resources at times of crisis, such as a war or following a natural disaster. Free markets also fail at times to allocate resources efficiently, so remedies often involve the allocation of resources by government to compensate for these failures.



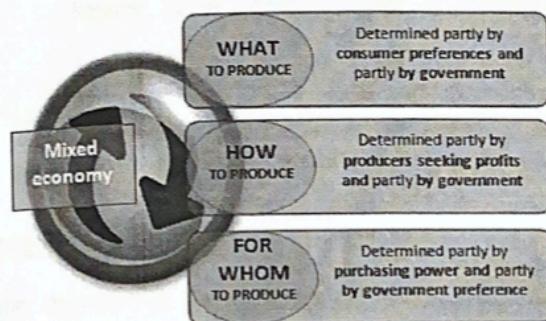
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disaster. Free markets also fail at times to allocate resources efficiently, so remedies often involve the allocation of resources by government to compensate for these failures.

### **Mixed economies**

There is a third type of economy involving a combination of market forces and central planning, called mixed economies.

Mixed economies may have a distinct private sector, where resources are allocated primarily by market forces, such as the grocery sector of the UK economy. Mixed economies may also have a distinct public sector, where resources are allocated mainly by government, such as defence, police, and fire services. In many sectors, resources are allocated by a combination of markets and planning, such as healthcare and, which have both public and private provision.



In reality, all economies are mixed, though there are wide variations in the amount of mix and the balance between public and private sectors. The key differentiation is the level of government intervention in the economy, and this exists on a spectrum. For example, in Cuba the government allocates the vast majority of resources, while in Europe most economies have an even mix between markets and planning. Economic systems can be evaluated in terms of how efficient they are in achieving economic objectives.

## UNIT 7 –MACROECONOMY POLICIES II

### I. FISCAL POLICY

#### 1. INTRODUCTION

- Demand-management policies – affect AD → RNY, employment, GPL
- Supply side policies – affect AS, actual & potential output, employment, GPL

#### 2. FISCAL POLICY

**2.1 FISCAL POLICY** is the deliberate management of government spending and taxation designed to influence level of economic activity to achieve economic goals of government

#### 2.2 ECONOMIC GOALS

- Macroeconomic – sustained, sustainable, inclusive ec. growth (smooth fluctuations in ec. activity); push ec. closer to full employment, maintain price stability, achieve favourable BOT
- Microeconomic – more efficient allocation of resources; more equitable distribution of Y

**2.3 RATIONALE** – private decisions on C & I based on self-interest → excessive AD, excessive inflation | lacklustre AD, serious UnE

#### 2.4 FISCAL POLICY TOOL – BUDGET

- Budget deficits & surpluses deliberately planned (discretionary fiscal policy) to impact economy
- Ex. SG: National Budget – annual statement of gov accounts on estimated expenditure & revenue

#### **→ 1. Sources of government revenue** – taxation, sale of G&S

- **Taxes** are compulsory payments made by individuals or firms in the private sector to government without any services rendered in return; transfer of funds from private sector to gov
- **Sale of G&S** – state enterprises (fees from postal, telecommunications, public utilities services, earnings from commercial & industrial undertaking, state trading); sale of gov. bonds; licence fees & fines (ex. marriage licence, hawker's licence, littering fines)

**Taxation** – impact (party handling levy to tax authorities) & incidence of tax (dist of tax burden; PED/PES)

- Direct taxes – Y & wealth paid direct to Tax Department (IRAS); borne by individuals/firms
  - Impact & incidence on same party, X easily shifted; ex. personal Y & corporate tax
- Indirect tax – on expenditure/production of G&S (ex. GST)
  - **Consumers bear part of tax burden; impact & incidence X on same person**

**A Tax structure of a country's tax system** – tax can be proportional, progressive, or regressive

- Marginal tax rate – proportion of additional income paid in taxes; ↑ tax burden on ↑ Y
  - MTR = change in tax paid/change in income
- Average tax rate – proportion of total income paid in taxes; overall tax burden on taxpayers
  - ATR = total tax paid/total income

#### B Different categories of taxes

- Proportional tax – same proportion of Y is paid as tax as Y rises
  - Ex. corporate tax in SG is 17% of company's profits
- Progressive tax – ↑ Y, ↑ rate of tax (↑ proportion of Y from rich; considers ability to pay)
  - Pros – ↓ post-tax Y differentials vs pre-tax Y differentials
- Regressive tax – ↑ Y, ↓ rate of tax (↓ proportion of Y from rich)
  - Ex. indirect tax on G&S on necessities, poor spend ↑ proportion of Y

**C Economic effects of different types of taxes** – depends on type of tax levied

#### **A Incentive to work (labour supply)** – Δ depends on relative strength of Y & sub. effects

- ↑ Y tax encourage absenteeism, discourage overtime work → ↓ labour SS + productive capacity
- Net effect uncertain – debt (↑ work, ↓ leisure; Y effect dominates); ↓ financial commitments (sub)
  - Y effect – ↑ taxes, X afford same amount of leisure and G&S, ↓ disposable Y, ↓ C → work ↑ hours, ↓ leisure hours to reduce cut in C → ↑ taxes encourage people to ↑ work
  - Substitution effect – ↑ taxes, ↓ C → small opp. cost for leisure → ↑ taxes, discourages work

#### **B Savings** – highly progressive Y, high capital transfer & wealth taxes, ↓ willingness & ability to save

- ↓ pool of loanable funds for capital formation |

<ul style="list-style-type: none"> <li>Ex. SG X estate duty (inheritance tax), encourage savings + growth of wealth management industry</li> </ul>
<b>C Investments</b> – ↓ corporate taxes, ↑ after-tax profits, ↑ financial capital available for I, ↑ I
<ul style="list-style-type: none"> <li>Limitation – I depends on prevailing i/r, business costs (wage rates, rentals), future exp.</li> </ul>
<b>D Inflation</b> – inflationary (indirect taxes); deflationary (direct taxes)

- Indirect taxes on G&S: ↑ p + cost of living, trade unions DD ↑ wages, inflationary spiral

- Direct taxes: ↓ disposable Y, ↓ DD for G&S, ↓ prices, deflationary

**E Resource allocation** – tax incentive (deductions for local R&D), ↓ p of G&S, influence SS of types of G&S

+ allocation of resources; influence SS of various types of labour & output of various occupations

- Ex. ↑ paying jobs, ↑ progressive Y tax, outflow of talent to countries with lower tax

## → 2. Government expenditure

– spending by public sector

**Types of expenditure** – operating expenditure, development expenditure

- Operating expenditure – spending by gov. on day-to-day routine; recurrent in nature
  - General services (gov depts & ministries), economic services (transport, storage & telecom services, farm aid in times of drought during ec. crisis), social services (education, health & social welfare services), community services (sewerage & fire brigade), servicing national debt (paying interest on existing debts + capital repayments when debts mature)
- Development expenditure – purpose of economic & social development
  - Ex. building expressways, schools, land reclamation, flood alleviation schemes

## Economic effects of different types of government expenditure

### A Income and wealth re-distribution and SOL

- Welfare benefits + progressive Y tax system – benefit poor, ↑ SOL, ↓ InEQ of Y & wealth dist.

### B Economic growth

– infrastructure devt + improvement & extension of transport & comm. facilities

- ↑ productive efficiency of country, attract productive I, ↑ AD + ↑ AS, sustained ec. growth

### C Resource allocation

– affect pattern of production

- Rapid move from labour-intensive to capital-intensive industries (grants & subsidies to encourage

expansion of capital-intensive industries), resources move → ↑ AD + AS (part of SS policies)

## 2.5 TYPES OF FISCAL POLICY

**→ Discretionary fiscal policy** – deliberate change in gov. expenditure and/or taxes to bring about desired change in level of AD (Budget is main tool; estimate of gov expenditure & revenue; gov's financial stance)

- Importance – facilitate ↑ revenue to cover spending programmes; instrument to manage ec. (gov plan for budget deficit/surplus)

**1. Expansionary fiscal policy** – applied during economic recession AND operating below full employment

- Stimulate AD → ↑ G or ↓ T → budget deficit

### A Increasing government expenditure G

- ↑ G: ↑ AD of G&S, ↑ C, more than proportional ↑ RNY due to multiplier effect

### B Reducing taxes T

- ↓ T, ↑ HH disposable Y, save some additional Y, spend some on consumer G&S, ↑ C, ↑ AD (multiplier effect), more than proportional ↑ RNY

### G vs T as policy tools

- ↑ G greater impact on ↑ AD & RNY & ↓ UnE than equivalent ↓ in taxes
  - Why? ↑ G directly ↑ AD, direct impact on output & employment | T X affect Q & E directly (part of it saved, X spent, X all additional Y in circular flow of Y)

**2. Contractionary fiscal policy** – curb excessive high AD & inflationary pressures

- Planned budget surplus → ↓ G or ↑ T (effect opposite of expansionary fiscal policy)

## SECTION SUMMARY

- Discretionary fiscal policy is where the government deliberately changes taxes and/or government expenditure in order to alter the level of aggregate demand
- Changes in government expenditure on goods and services will have full multiplier effect. However, changes in taxes have a smaller multiplier effect as it depends on the marginal propensity to consume

→ **Non-discretionary fiscal policy (automatic stabilisers)** – automatic fiscal policy that checks/ stimulates ec. activity, not by any deliberate government action, but by operation of built-in or automatic stabilisers

- Dampens ec. cycle fluctuations in Y & employments; ↑ budget deficits (slumps), ↑ surpluses (booms)

#### Examples of built-in stabilisers

##### A Progressive tax structure – ↑ economy, ↑ tax payments faster than ↑ Y

- ↑ tax revenue people (why? ↑ earn, higher Y tax brackets), ↑ withdrawal exerts contractionary impact on economy → control ↑ C & AD, ↓ economic expansion, ↓ pressure on prices → progressive tax systems stabilise any Δ spending & economic activity

##### B Unemployment compensation

- ↓ Y & ↑ UnE, ↑ UnE benefits paid, offset loss of earned Y of UnE, slows ↓ AD
- Ec. expands, ↓ workers UnE, ↓ UnE benefits paid out, slows ec. growth

##### C Family assistance programme – aid tied to Y levels in economy, automatically stabilise DD

- ↑ provisions to families arising from hard times, slow ↓ C & AD & real national output

#### SECTION SUMMARY

- Non-discretionary fiscal policy or built-in stabilizers are automatic changes in tax revenues and government expenditure
- Non-discretionary fiscal policy exercise counter-cyclical effect on economic activity. They help to reduce the magnitude of the fluctuations in national income
- However, it will not eliminate fluctuations entirely and therefore cannot be completely relied on, hence, discretionary fiscal policy is required

## 2.6 EFFECTS OF FISCAL POLICY ON THE ECONOMY

#### → Fiscal policy and economic growth & employment

- Ex. gov spends \$10m to build new polytechnic with large domestic contractor, firm XYZ
- Multiplier effect: ↑ DD by gov, ↑ firms' profits, hire ↑ FOP (labour), ↑ RNY → workers ↑ Y, ↑ C on G&S; withdrawals → sellers of G&S earn ↑ profits to smaller extent, ↑ production & hire ↑ workers → initial spending stimulates successive rounds of spending → more than (k) ↑ RNY & AD
  - Extent of ↑ AD depends on marginal propensity to consume MPC
- Link – expansionary DD-management policies, ↑ production, ↑ real national output & ↑ employment
- Caveat – type of G/ΔT affect productive capacity of economy
  - ↑ G on I & ↑ R&D tax incentives, ↑ potential output (fiscal measures with SS-side effects), ↑ productive capacity + achieved sustained ec. growth

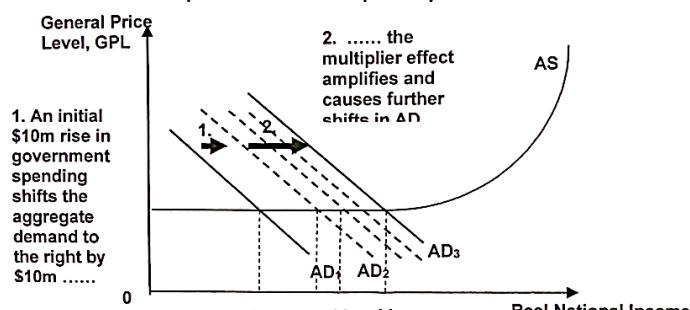


Figure 1: Multiplier Effect of Government Spending

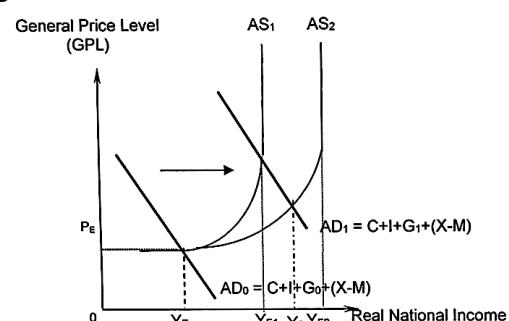


Figure 2: Some Expansionary Fiscal Policy may increase productive capacity of the economy

#### → Fiscal policy and inflation

- DD-pull inflation v controlled by contractionary fiscal policy (↓ G/↑ T → budget surplus)
  - ↓ G directly, ↓ C & I, ↓ AD & pressure on GPL, dampening effect on economy
  - Assume ec. in expansionary phase where HH & firms optimistic & ↑ spending
  - Prevent ↑ GPL from  $OP_1$  to  $OP_2$ , ↓ AD from  $AD_2$  to  $AD_3$  by ↓ G/↑ T
- Alternative – fiscal measures targeting AS in economy (X target root cause of DD-pull inflation)

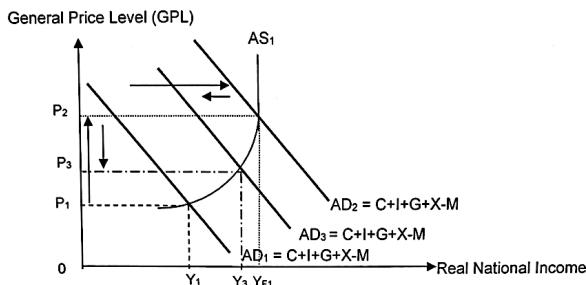


Figure 3: Fiscal Policy and Inflation

- Ex. ↓ corporate tax, ↑ accumulation of fixed capital assets (production facilities, machineries), ↑ productive capacity in LR **AND** ↓ unit labour COP (assume productivity growth > wage growth due to more efficient labour-capital ratio combination) → ↓ DD-pull inflation + moderate wage-push inflation in LR → ↓ overheating in ec. LR but worsen SR inflation

→ **Fiscal policy and BOT** (note: conflict between internal & external objectives; ↑ BOT with ↓ growth & ↑ UnE)

- **BOT deficit, contractionary fiscal policy (budget surplus):** ↓ AD, more than (k) ↓ RNY (multiplier), ↓ PP, ↓ M expenditure (depends on MPM), ↑ BOT **AND** ↓ GPL, ↓ p, exports cheaper to foreign consumers, ↑ QD of X (assume PED<sub>x</sub> > 1), ↑ QD more than (k) ↓ price of X, ↑ X revenue **AND** ↓ domestic p, M subs. relatively more expensive, switch from M, ↓ DD<sub>M</sub>, ↓ M expenditure → ↑ BOT

→ **Fiscal policy and other microeconomic objectives**

#### A Income distribution from rich to poor

- Progressive tax system/G (public housing, hospitalisation, education), ↓ Y gap, ↑ inclusive ec.
- ↑ GST, regressive, lower Y earners affected ↑ (k)
  - Collection of GST revenue more broad-based; contributed by foreigners & tourists

#### B Resource allocation – subsidies & tax exemptions divert resources from one type of sector to another

- Some G addresses market failure, allocate resources more efficiently (public goods, health, edu.)

## 2.7 LIMITATIONS OF FISCAL POLICY

→ **Limitations of expansionary discretionary fiscal policy**

#### A Size of multiplier – affects extent of ↑ RNY for given ↑ autonomous spending

- ↓ k (high withdrawals, MPM, MPS), ↑ G to achieve desired ↑ RNY, limits effectiveness in achieving economic growth OR ↓ cyclical UnE when economy operating near full capacity
- ↑ G more expansionary than ↓ T; why? gov has direct control over development expenditures
  - ↑ effective in stimulating economy than ↓ T (due to presence of withdrawals)

#### B Role of consumer and business confidence – bleak ec. outlook, X effective in ↑ AD & ec. recovery

- Consumers X certain about future ec. outlook, Y & employment (recession), will not ↑ C when ↓ T, save additional Y to protect against future uncertainty and loss of employment
- Firms: pessimistic outlook, X certain future πs, X expand production facilities | X Δ private I (influenced by other factors) → relocate w ↑ prospective πs (Middle East, Africa, Brazil, Russia, India, China w ↑ youth population)

#### C Problems of time lags – requires passing new laws; complicated & time-consuming → destabilising

- Recognition lag – when recognised, economy already few months into problem
- Administrative lag – planning, designing & signing contracts takes time before implementation
- Operational lag – time between action taken and impact of action on Q, UnE, and P
  - Ex. Δ corporate T affect payments at end of financial year (full 12 month delay) → affect ΔI as planning required

#### D Crowding out effect – ↑ AD depends on relative size of multiplier effect & crowding-out effect

1. **Crowding out of domestic private I** – ↑ borrowing from private sector to finance budget deficit

- $\uparrow G$  (initial  $\uparrow AD$ ),  $\uparrow$  competition for scarce funds,  $\uparrow i/r$  & cost of borrowing,  $\downarrow$  private expenditure,  $\downarrow I$ , offsets fiscal expansion on  $AD$ ,  $AD$  curve shift leftwards, net  $\uparrow AD < \downarrow AD$
- Caveat – borrow from external sources (foreign financial institutions), smaller  $\downarrow I$  &  $AD$
- Note – X relevant in SG; gov use reserves from past to finance deficit spending; X borrow extensively

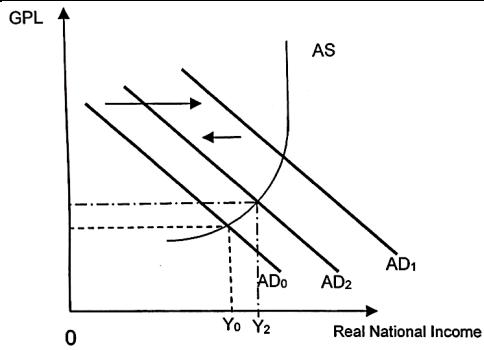


Figure 4: The Shift in Aggregate Demand

## 2. Crowding out in an open economy

- $\uparrow$  borrowing money from private sector,  $\uparrow i/r$ ,  $\uparrow$  SR capital inflows/hot money (free capital mobility), currency appreciates (flexible ER system),  $\uparrow DD$  currency, ceter. par.  $\rightarrow \downarrow X$  p-competitiveness,  $\downarrow QD$  of  $X$ ,  $\uparrow QD$  of  $M \rightarrow$  crowding out of net-exports,  $\downarrow$  effectiveness of expansionary fiscal policy

## E Sustainability of running a budget deficit – cost of running budget deficit depends on following factors

### 1. Choice of instruments – raising government expenditure or reducing taxes

- $\downarrow Y$  tax,  $\downarrow$  willingness to work ( $Y$  effect  $>$  sub. effect),  $\downarrow SS$  labour,  $\downarrow AS$ ,  $\downarrow$  potential ec. g. & SOL

### 2. Time period – large & persistent budget deficit (structural deficit) vs cyclical (temporary) deficit

- Large & persistent deficit:  $\uparrow$  severe problem for  $G$ , pose deficit irrespective of ec. performance
  - Accumulate budget deficit + X political will in  $\downarrow$  deficit (measures politically unpopular), national debt  $\rightarrow$  default on loans, austerity measures by lenders (IMF/ECB/EU bailout program)  $\rightarrow$  contractionary,  $\downarrow$  credibility, overthrown (X manage macroeconomic crisis)
  - Debt holders require  $\uparrow i/r$  to compensate  $\uparrow$  risk of default, curtail ability to repay debt  $\rightarrow$  debt crisis,  $\downarrow$  investor confidence
- Cyclical deficit (business/economic cycle): likely not a concern when ec. recovers

## F Conflicts with other macroeconomic objectives

### 1. Trade-off with internal aims – promote economic growth & $\downarrow$ cyclical UnE

- At expense of  $\uparrow DD$ -pull inflationary pressures & consumer p if for prolonged period of time

### 2. Trade-off with external aims – $\uparrow$ domestic inflation rate, $\downarrow$ competitiveness

- $\uparrow$  domestic inflation  $>$  trading partners,  $\uparrow X$  p ( $PED_x > 1$ ),  $\downarrow DD_x$  more than ( $k$ ) AND  $M$  less expensive,  $\uparrow DD_M$ ,  $\uparrow M$  expenditure (depends on CED)  $\rightarrow \downarrow (X - M)$ ,  $\downarrow BOT$

## G Role of expectations

### Ricardian Equivalent Theory

- HH have rational expectations, use available ec. information to make ec. decisions, forward-looking
- HH smooth out consumption over life cycle to maintain same SOL over lifetime
- If assumptions true, current C  $\propto \Delta T$  when  $\downarrow Y T / \uparrow$  transfer payments (GST-offset package/vouchers)
  - Why? HH view  $\downarrow T$  as temporary, expect future  $\uparrow$  tax rates, uncertain about future  $Y$ ,  $\uparrow$  precautionary savings from higher  $Y$  to pay for  $\uparrow$  possible taxes in future + smooth out C over lifetime (X affect future SOL)  $\rightarrow$  HH X see  $\Delta$ permanent disposable  $Y \rightarrow$  ineffective
- Caveat – HH myopic, spend additional disposable  $Y$  for current C (seniors: X concerned future T)

## H Other limitations

### 1. Problem of magnitude with forecast errors – depends on accuracy & predictability of outcome

- V difficult to estimate size of  $k$  (MPC fluctuates as HH C depends on expectation of future  $\Delta p$  &  $\Delta Y$ )

### 2. Inflexibility (lack of reversibility) – difficult to $\downarrow G$ when economy recovers (esp if public works)

- Public works X stopped midway even when economy recovered from recession

### 3. Political pressures from lobby groups (vested interest groups)

- Deficits: politically attractive; surpluses: politically painful  $\rightarrow$  gov implement exp. even when budget deficit X feasible/effective

## → Limitations of contractionary discretionary fiscal policy

### A Role of expectations and confidence

- HH confident about future & certain about Y & employment prospects, ↑ C
- Firms optimistic about future profitability, ↑ production facilitates despite ↑ corporate T + ↑ fixed capital → fiscal policy ineffective in ↓ AD to reign in inflationary pressures

### B Conflict with other macroeconomic aims

- ↓ consumer p, ↓ production, ↓ derived DD labour, ↑ cyclical UnE

### C Inflexibility (downwards) – ex. ↓ infrastructure spending on key projects to dampen DD-pull inflation

- Unfeasible during high inflation → why? projects require LT investment & commitment from gov.

### D Undesirable impact on economic growth & SOL: ↑ Y tax, ↑ willingness to work, ↑ labour SS & AS

- Sub effect > income effect: adversely affect ec. growth & ↓ SOL in LR
  - Y effect (↓ disposable Y, work harder to maintain current C, ↑ SS<sub>labour</sub>)
  - Sub effect (↓ opp cost of leisure, ↓ SS<sub>labour</sub>)

## → Limitations of non-discretionary fiscal policy (automatic stabilisers)

### A Adverse supply-side effects

- ↑ tax rates, discourage work effort, initiative (promotion) & taking risks, ↓ AS, ↓ potential growth
- ↑ rate of inflation – smaller ↑ AS than ↑ AD
- ↑ UnE benefits ↑ frictional UnE; why? ↓ opp cost of being UnE, ↑ time looking for ‘right’ job

### B Problem of fiscal drag – tendency of automatic fiscal stabilisers to reduce recovery of ec. from recession

- Progressive tax rates, ↑ tax revenue, dampens ↑ disposable Y & C **AND** ↓ transfer payments with recovery, ↓ extent of ↑ C → drag on AD & ability to attain full employment level of RNY → dampens economic recovery (note: bigger ΔG/T needed to achieve given ΔRNY)

## SECTION SUMMARY

- Factors affecting effectiveness of discretionary fiscal policy include size of multiplier, expectations and confidence of firms & consumers, methods of financing government expenditure, policy conflicts, time lags, inflexibility of government expenditure, as well as, inaccurate projections
- Non-discretionary fiscal policies can create disincentives effects on households and firms due to the uncertain effects of tax changes on consumption and investment. It can also act as drag on recovery from a recession

## 2.8 FISCAL POLICY IN SINGAPORE – promote LT economic growth

- Private sector is engine of growth; gov role to provide stable & conducive environment
- T & G policies justified on microeconomic grounds; focus on SS-issues (saving incentives, I & enterprise)
- Counter-cyclical role of fiscal policy is limited due to high import leakages
- SG successful policy; why? gov's prudent expenditure patterns & conducive taxation policies complement monetary policy in promoting sustained & non-inflationary economic growth
- Focus – deliver essential public G&S (education, public housing, healthcare, national security); build & maintain world-class economic infrastructure & services [development expenditure is 1/3 of G]
- Tax policies – enhance ec. competitiveness & attract foreign I/talents; lowest direct T globally
- Result – consistent budget surpluses, high I rates w/o incurring foreign debt + ↑ national reserves → ↑ investor confidence + buffer against adverse economic shocks

## 2.9 CONCLUSION – COVID-19 crisis ameliorated w/o taking on substantial debt

- Unprecedented fiscal responses to support businesses & HH; ST relief & starve off ec. scarring from mass bankruptcies & UnE
- Accelerate devt. in tech & social support systems, more digitalised economy to grasp growth opp.
- Ex. SG record 5.4% economic contraction, initial fiscal response >19% of GDP + draw part of national reserves → small economies ✓ act effectively in crisis to ameliorate adverse economic impacts

## II. MONETARY POLICY

### 1. INTRODUCTION – MONETARY POLICY AROUND THE WORLD

**1.1 DEFINITION OF MONEY** – money is anything that is generally accepted in payment for G&S or in repayment of debt (ex. paper money, checks, E-money)

- **M1 Narrow money** – comprises of currency in circulation + demand (checkable) deposits
- **M2** – comprises of M1 + savings deposits + small-denomination time deposits

**1.2 DEFINITION OF MONETARY POLICY** – refers to a Central Bank's actions to influence availability and costs of money and credit to achieve macroeconomic goals of sustained rate of economic growth, low inflation, full employment and favourable balance of payments; done by influencing i/r or money SS in economy

- **Conventional MP** (ex. US) – C & I large part of AD; i/r or money SS used as tool of monetary policy
- **ER policy** (SG: small, open ec.) – total trade ( $X + M$ ) close to x4 GDP value; anchor MP to ER
  - MAS manages value of SGD within desired range in relation to basket of foreign currencies
- **Central bank** is the principal monetary authority of a nation; performs several key functions (being bankers' bank, issuing currency, regulating SS of credit in economy)
- **Central banks around the world**: US (Federal Reserve Bank); UK (Bank of England), Japan (Bank of Japan), SG (Monetary Authority of Singapore)

### 2. MONETARY POLICY USING THE INTEREST RATE AS THE POLICY INSTRUMENT

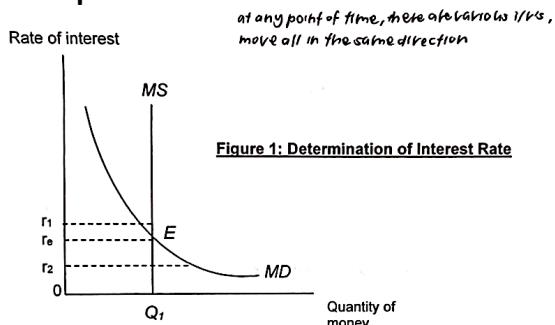
**2.1 RATE OF INTEREST** – interest rate is the 'price of money'

- Lenders' POV: cost of using borrowed money | Savers' POV: reward of putting aside money
- i/r determination models: liquidity preference theory, loanable fund theory

**2.2 INTEREST RATE DETERMINATION IN MONEY MARKET: LIQUIDITY PREFERENCE THEORY**

- Liquidity preference – DD to hold 'liquid' money, cash balances, store of wealth

→ **Graphical illustration**



- $MD (DD_{money})$ ,  $MS (SS_{money})$ ; equilibrium E with equilibrium rate of interest,  $r_e$
- $i/r > r_e$ :  $QD_{money} < QS_{money}$ , surplus,  $\downarrow i/r$  from  $r_1$ ,  $\uparrow QD$ , movement down MD until  $r_e$  ( $QD = QS$ )
- $i/r < r_e$ :  $QD_{money} > QS_{money}$ , shortage,  $\uparrow i/r$  from  $r_1$ ,  $\downarrow QD$ , movement up MD until  $r_e$  ( $QD = QS$ )
- $\uparrow MS$ ,  $\downarrow i/r$ , vice versa

→ **Demand for money** – desire to hold cash balances (keep wealth in form of money, X earn interest) rather than in interest-earning assets, such as bonds; three motives for holding money

**Total DD for money/liquidity preference = sum of (transactionary, precautionary & speculative DD<sub>money</sub>)**

**A Transactions motive** – desire to hold cash balances to pay for current expenditure; amount depends on

- Level of Y –  $\uparrow Y$ ,  $\uparrow$  spend due to  $\uparrow SOL$ ,  $\uparrow$  amount of cash held
- Interval & frequency of Y received –  $\uparrow$  interval,  $\downarrow$  frequency,  $\uparrow$  amount of cash held
- Movements in prices of G&S –  $\uparrow p$ ,  $\uparrow$  cash balances to pay for same amount of G&S (more ex.)
- Note – transaction DD money is interest inelastic (X very sensitive to changes in i/r)

**B Precautionary motive** – meet expenditures arising due to unforeseen circumstances (illness, accidents)

- Depend on nature of individual:  $\uparrow$  cautious individual,  $\uparrow$  cash held
- Note – precautionary DD fairly stable & interest inelastic

**C Speculative motive** – money held in excess of transactionary & precautionary motives; DD for idle balances; hold cash balances in anticipation of making gains through purchase of bonds (Keynes' def)

- Interest-elastic; why? opp cost of holding cash balances = i/r received from bonds
  - $\downarrow i/r$ ,  $\downarrow$  opp cost of holding cash balances, X invest in bonds,  $\uparrow QD_{money}$  (converse is true)
- Inverse r/s between speculative DD and i/r ( $\uparrow i/r$ ,  $\downarrow QD_{money}$ )

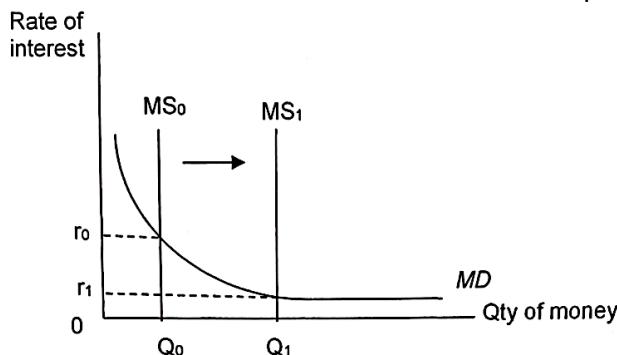
→ **Supply of money** – determined by monetary authorities; independent of i/r; perfectly inelastic SS curve

- $\uparrow SS$  money,  $\downarrow i/r$ ; Central Bank influences money SS to induce  $\Delta i/r$  for macroeconomic aims

## 2.3 INTEREST RATE DETERMINATION IN GOODS MARKET: LOANABLE FUNDS THEORY

- Interaction of borrowers ( $DD_{\text{loanable funds}}$ ) and lenders ( $SS_{\text{loanable funds}}$ ) determines  $i/r_{\text{equilibrium}}$
- Determination of  $i/r$  in loanable funds market X relevant to monetary policy

## 2.4 TYPE OF MONETARY POLICY STANCE – depends on economic circumstances of each economy



**Figure 2: Expansionary Monetary Policy**

- Expansionary monetary policy** (cheap/loose MP) –  $\uparrow SS$  money,  $\downarrow i/r$ ,  $\uparrow$  credit availability, borrowing cheaper; during economic slowdown/recession to  $\uparrow RNY$  &  $\downarrow$  cyclical UnE
- Contractionary monetary policy** (restrictive or tight monetary policy) –  $\downarrow SS$  money,  $\uparrow i/r$ ,  $\downarrow$  credit availability, borrowing more costly; during inflation to  $\downarrow$  inflation rate

## 2.5 MONETARY POLICY – $i/r$ affects C (HH), I (capital goods & inventories), $(X - M)$ by foreign sectors

### 1. Expansionary Monetary Policy – tackling recession and cyclical unemployment

- Aim –  $\uparrow$  economic growth,  $\downarrow$  cyclical UnE | when economy near zero/-ve RNY growth & high UnE

→ How it works

**Internal effects (primary effect)** –  $\downarrow i/r$ ,  $\downarrow$  cost of financing loans, cheaper to borrow

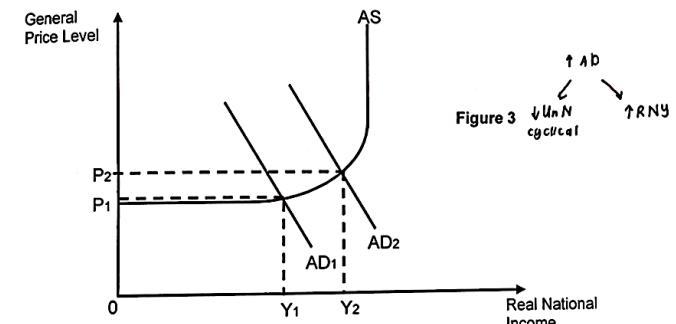
- HH:  $\uparrow$  borrow to purchase big-ticket items/consumer durables,  $\downarrow$  incentivised to save ( $\downarrow$  rewards from savings),  $\uparrow$  consumption spending
- Firms:  $\downarrow$  cost of borrowed funds,  $\uparrow$  profitable projects,  $\uparrow$  investment in plants, machines & inventories,  $\uparrow C \& I$ ,  $\uparrow AD$  in economy

**External effects (secondary effect)** –  $\downarrow$  domestic  $i/r$ ,  $\downarrow i/r$  in country  $>$  other countries

- Unrestricted capital (financial) flows in open ec., hot money outflows to countries with  $\uparrow i/r$ ,  $\uparrow SS$  country currency in FOREX, depreciation of currency (free/managed float ER system)
- $\downarrow ER$ ,  $\uparrow p.$  competitiveness of  $X$ ,  $\uparrow X \text{ AND } M$  more expensive,  $\downarrow M \rightarrow \uparrow (X - M)$ ,  $\uparrow AD$

→ Impact on real national income, employment, and inflation

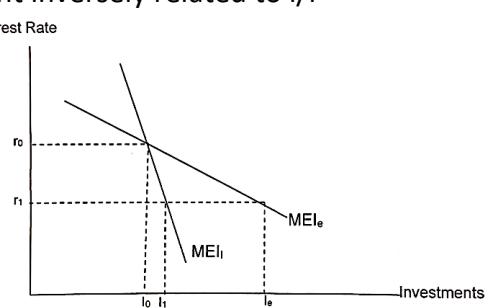
- $\uparrow C, I, (X - M) \rightarrow$  autonomous  $\uparrow AD$ , multiple rightward shifts of AD curve from  $AD_1$  to  $AD_2$ , more than ( $k$ )  $\uparrow RNY_{\text{equilibrium}}$  from  $Y_1$  to  $Y_2$  (multiplier,  $\sqrt{k}$  spare capacity),  $\uparrow FOP$  employed,  $\downarrow$  cyclical UnE
- Caveat – DD-pull inflation if limited/no spare capacity, overall  $\uparrow GPL$  from  $P_1$  to  $P_2 \rightarrow$  dampens  $\uparrow RNY$  as resources  $\uparrow$  scarce,  $\uparrow$  costly to produce each unit of output,  $\uparrow p$  for profitability,  $\downarrow QD$  (wealth,  $i/r$ , international trade effects),  $\uparrow p$  until equilibrium GPL & RNY



→ Limitations of expansionary monetary policy – MP X relied solely to manage economy

**A Interest elasticity of demand for investment** – DD for investment inversely related to  $i/r$

- MEI curve interest-elastic – I responsive to  $\Delta i/r$  |  $\downarrow i/r, \uparrow I$  more than ( $k$ ), effective in  $\uparrow AD$
- MEI investment interest-inelastic –  $\downarrow i/r, \uparrow I$  less than ( $k$ ), X effective in  $\uparrow I \& AD$ 
  - When large proportion of investments funded by FDI (flow of funds from external sources into country to acquire capital goods – equipment, factories)



**Figure 4: Interest Elasticity of Demand for Investments**

- Why? foreign MNCs have own fund sources, X borrow from local banks,  $\downarrow i/r$  X impact I

#### B Expectations of the future state of the economy – business expectations

- Business pessimism –  $\downarrow i/r$  X induce  $\uparrow I$  (Keynesian belief), MEI shift left due to  $\uparrow$  pessimism,  $\downarrow I$ , MP ineffective in stimulating economy

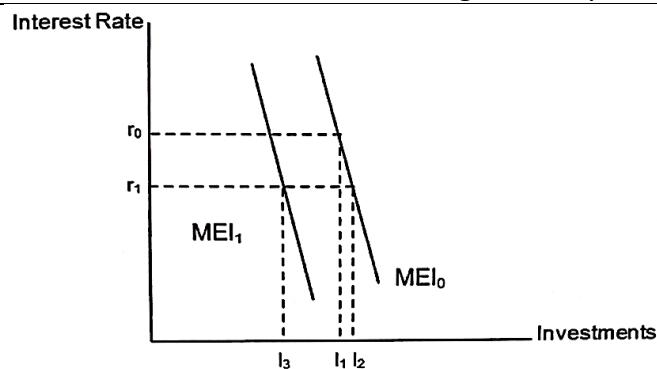


Figure 5: Effect of pessimism on investment

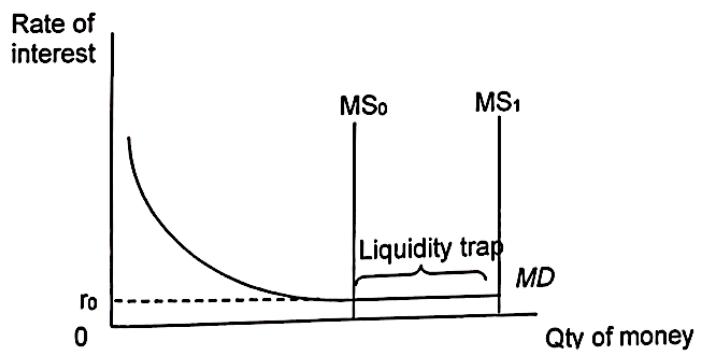


Figure 6: The Liquidity Trap

#### C Liquidity trap – $\uparrow$ SS money from $MS_0$ to $MS_1$ X affect $i/r$ ; why? difficult for $i/r$ fall below zero

- Very low levels  $i/r$ , DD money becomes perfectly interest elastic, AD & RNQ remain the same

#### D Time lags between implementation and impact on the economy – due to multiplier effect

- Fairly long time for MP to affect economy (3 months – 2 year),  $\downarrow i/r$  less effective in  $\uparrow$  RNY &  $\downarrow$  UnE → may take effect during ec. recovery, cause unintended DD-pull inflation

#### E Inability to achieve specific macroeconomic objectives – MP is a DD-management policy influencing AD

- Ineffective in tackling supply-side macroeconomic problems (structural UnE: retraining required)

#### F Conflicts with other macroeconomic aims – expansionary MP aims to $\uparrow$ RNY & $\downarrow$ UnE

- Caveat –  $\uparrow$  inflation rates (ec. operating in intermediate range of AS, limited spare capacity) → Central Bank to decide to prioritise actual growth/unemployment or inflation aims

## 2. Contractionary Monetary Policy (tight money policy) – tackling high inflation i

- $\uparrow i/r$  by Central Bank in ec. near/full employment level of national Y &  $\uparrow$  AD continues,  $\downarrow$  inflation

#### → How it works

##### Internal effects – $\uparrow i/r$ , $\downarrow C$ & I

- HH:  $\uparrow$  costly to obtain loans from bank to finance big-ticket items & consumer durables
- Firms:  $\downarrow$  investment projects with expected rate of return  $\pi > \uparrow$  cost of borrowing

##### External effects – $\uparrow i/r$

- $\uparrow$  interest returns, hot-money inflows,  $\uparrow$  DD currency, appreciation of ER
- Appreciation, exports  $\downarrow$  p competitive in international market,  $\downarrow$  DD X,  $\downarrow$  X revenue AND M cheaper,  $\uparrow$  DD M,  $\uparrow$  M expenditure →  $\downarrow (X - M)$ ,  $\downarrow$  AD

#### → Impact on real national income, employment and inflation

- $\downarrow C, I, (X - M) \rightarrow$  autonomous  $\downarrow$  AD, multiple leftward shifts of AD curve from  $AD_1$  to  $AD_2$ , inflationary pressures dampened,  $\downarrow$  output produced,  $\downarrow$  RNY +  $\downarrow$  DD workers,  $\uparrow$  cyclical (DD-deficient) UnE

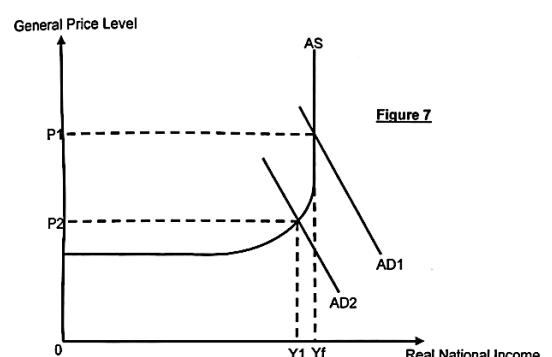


Figure 7

→ **Limitations of contractionary monetary policy** – i/r elasticity of demand for I, alt. funding, time lags

**A Short/long term basis of projects**

- ↑ i/r may ↓ AD; why? firms LT projects X abandoned easily w/o incurring greater losses → high I due to committed LT investment projects (X easily reversed)

**B Conflicts with other macroeconomic goals** – inflation-UnE trade-off

- Central Bank ↑ i/r, ↓ DD G&S (control inflation), ↓ RNY & ↑ UnE

**3. Limitations of Monetary Policy** – conduct of MP generally limited by following factors

**A Time Lag** – recognition lag, implementation lag, impact lag (LT for policy action to affect economy)

- Complications – ex. ↑ DD-pull inflation, ↑ i/r → contractionary MP, ↓ AD (unanticipated) → unintended consequences: further ↓ AD, ec. contracts, ↑ UnE, X moderate ↑ inflation (p. stability)
- Mitigation – Central Bank formulate i/r policy in forward-looking manner, evaluate impact over medium term based on reasonable assumptions of economic outlook

**B Imperfect information** – Central Bank X have up-to-the-minute information on state of economy

- Economic data limited by time taken to collect & compile information
- X perfect knowledge of how ec. works (constant Δ domestic & int. economies)
- Difficult to predict future (lack of information, uncertainties) → forward-looking manner required

**SECTION SUMMARY**

- Expansionary monetary policy is primarily used to stimulate economic growth and reduce unemployment
- Contractionary monetary policy is primarily used to reduce inflationary pressures
- A change in interest rates also impacts the balance of payments position of a country due to 'hot' money flow
- The effectiveness of monetary policy depends on the responsiveness of households and firms to interest rate changes and its desirability depends on the extent of conflict with other macroeconomic goals

### 3. EXCHANGE RATE CENTRED MONETARY POLICY IN SINGAPORE

#### 3.1 SINGAPORE'S CENTRAL BANK – MAS conducts MP; centered on management of SGD ER

- Aim – price stability (low & stable inflation) as sound basis for sustained ec. growth in LR
- History – gradual & modest appreciation of SGD
  - Ex. 2008 Oct: zero-percentage appreciation of Nominal Effective ER policy band → why? easing external & domestic inflationary pressures & weakening global economic environment

#### 3.2 REASONS FOR POLICY TOOL – USE OF ER INSTEAD OF I/R (small size + ↑ openness trade & capital flows)

##### A Susceptible to imported inflation – SG lack natural resources; M daily requirements (food items)

- Cost of living sig. affected by imported final G&S p **AND** SG firms affected by p of imported raw materials & intermediate goods to produce final G&S, influence COP & GPL in economy → SG small economy, p-taker in global market, X affect foreign p of M
  - Ex. natural gas to generate electricity
- SG manage ER to influence domestic p of M, affect COP of SG firms, moderate inflation

##### B High dependence on external sector – M & X amount to ~ 400% of SG's GDP & total trade

- SG's focus – produce X ( $DD_x$  is ¾ of total DD in SG) → ER affect foreign p of SG's X (p competitiveness & QD<sub>exports</sub>), influence AD, RNY, derived DD for domestic resources (labour) → ER vv impt

##### C Inability to control interest rate due to openness to international capital flows

- SG as international financial centre: vast network of international financial linkages to maintain relatively free movement of financial capital; open ec. w free capital mobility into & out of SG
- Δ domestic & foreign i/r, large & quick movement of funds, difficult to target i/r (MAS X ↑ / ↓ i/r due to movement of funds) → SG i/r largely determined by foreign i/r; relinquish control over i/r
- Note – Open Economy Trilemma: i/r, ER, international financial capital (2 out of 3)

#### 3.3 CONDUCT OF MONETARY POLICY IN SG – SGD managed against a trade-weighted basket of currencies of major trading partners & competitors; Trade Weighted ER/Nominal Effective ER (S\$NEER)

- Real effective ER (S\$REER) – trade-weighted ER with effects of inflations taken into account
- Managed float ER: SGD V fluctuate within undisclosed band w/o intervention from  $E_u$  to  $E_L$ 
  - Assume ↑ preference for SGD G&S by foreign consumers, ↑ DD SGD, DD shift right, upward pressure on value of SGD, rise beyond upper limit  $E_u$  → MAS sell SGD in FOREX, ↑ SS SGD, ↑ SGD transacted in FOREX + appreciation of SGD from  $E_0$  to  $E^*$ , SGD remain within band
- MP statements issued twice a year (Apr, Oct); refer to book for parameters

Exchange Rate (US\$/S\$)

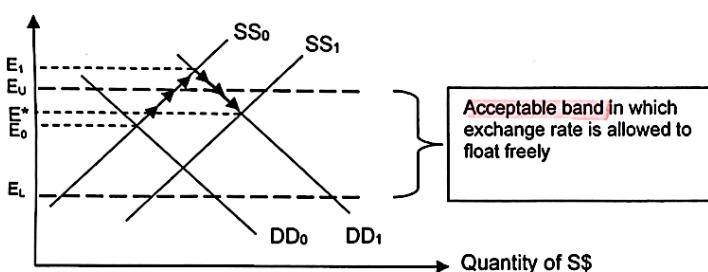


Figure 8: MAS Intervention to maintain the value of Singapore Dollar within the acceptable band ( $E_u$  to  $E_L$ )

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#### 3.4 EXCHANGE RATE POLICY – affects macroeconomy through impact on X & M prices; affect AD & AS

##### 1. Appreciation of SGD – MAS adopts modest & gradual appreciation of SGD, low & stable inflation for e.g.

###### Effects of appreciation on AS

- ↓ p of foreign final G&S, ↓ p SG HH pay for M G&S, ↓ COL, ↓ M-induced inflation
- ↓ p of imported raw materials, ↓ per unit COP of SG firms, ↑ AS, AS shift down from AS<sub>0</sub> to AS<sub>1</sub>

###### Effects of appreciation on AD

- ↓ p competitiveness of SG G&S in ST, ↑ p of SG X, ↓ SG X **AND** ↓ p of M, SG HH switch to relatively cheaper M goods, ↑ M → ↓ (X - M), ↓ AD, AD shift left

## → Effects of appreciation on economic growth, employment and inflation

- ↓ production level of SG firms, ↓  $(X - M)$ , ↓ AD, AD shift left, ↓ RNY from  $Y_0$  to  $Y_1$
- ↓ p of M raw materials, ↓ per unit COP of SG firms, AS curve fall, dampen ↓ RNY from  $Y_1$  to  $Y_2$
- Overall – appreciation, ↑ AS, ↓ AD → ↓ inflation rate, ↓ RNY, ↑ cyclical UnE (labour derived DD)

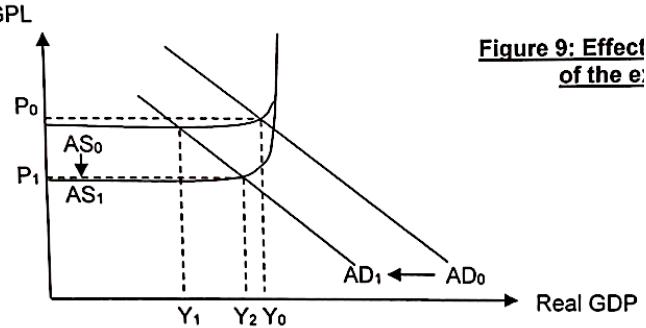


Figure 9: Effect of the appreciation of the exchange rate on the economy

## → Effect of appreciation on BOT – X relatively more expensive in foreign currency, M relatively cheaper

- ↓ QD X + ↑ QD M: assume Marshall Lerner Condition [ $PED_X + PED_M > 1$ ], ↓  $(X - M)$ , ↓ BOT

## → Limitations of appreciation of S\$

### A Conflicts in the short-term arising from appreciating the S\$ (dampen ↑ AD & DD-pull inflation)

- ST trade-off between macroeconomic goals: ↓ BOT, ceteris paribus
  - ↓  $(X - M)$ , ↓ AD (appreciation), more than ( $k$ ) ↓ RNY (multiplier), ↓ labour (derived DD), ↓ AD for G&S, ↓ FOP employed, ↑ UnE → policymakers decide time & extent of inflation
- Note: X conflict of aims in LT; why? low & stable inflation, ↓ risk of wage-price spiral, gain export competitiveness, ↑ SG X cheaper, ↑ DD SG X, ↑ AD → sustained actual growth in economy

### B Availability of foreign currency reserves – needed for intervention in FOREX to keep currency > eq. ER

- Insufficient reserves: X support high external value → speculators expect devaluation, aggressively sell currency → eventual devaluation of currency once foreign reserves exhausted

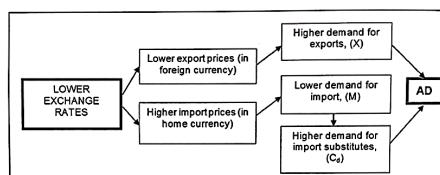
## 2. Depreciation of SGD

MAS adopt once-off depreciation of S\$ ER policy during deep economic recession with high/rising rates of unemployment; lowers band of ER S\$ permitted to fluctuate (0 appreciation policy)

### Effects of depreciation on AS – import prices (more significant for small, open economy)

- ↑ SG M prices, ↑ p SG HH pays for M G&S, ↑ COL (↑ CPI), M-inflation
- ↑ p of M raw materials & intermediate goods by SG firms, ↑ per unit COP, ↓ AS, upward shift

### Effect of depreciation on AD



- ↑ p competitiveness of SG G&S, ↓ p of G&S, ..., ↑  $(X - M)$ , ↑ AD in SR, AD shift right
- Caveat – export competitiveness gained from weakening ER much lower than expected, ↑ X in ST, but ↑ M inputs, ↑ COP AND ↑ X-growth, economy overheat, ↑ DD domestic resources (labour), ↑ wages, ↑ p → offset gains in export competitiveness due to depreciation of S\$

## → Effects of depreciation on economic growth, employment, and inflation

- Result 1: ↑  $(X - M)$ , ↑ AD (AD shift right) → ↑ production levels to meet ↑ X orders, rundown of stocks & inventories, ↑ production workers required → spare capacity in economy: ↑ workers hired (labour is derived DD), ↑ production → ↑ RNY, actual economic growth & ↓ lower cyclical UnE
- Result 2: ↑ M raw materials used by SG firms, ↑ COP, ↓ AS, dampen ↑ RNY from  $Y_1$  to  $Y_2$
- Overall: dampened ↑ real national output  $Y_0$  to  $Y_2$ , lower UnE, ↑ GPL  $P_0$  to  $P_1$

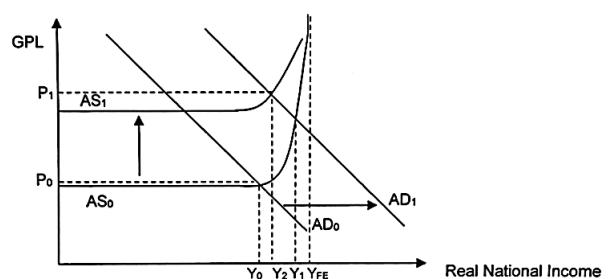


Figure 10: Effects of a depreciation of the exchange rate

## → Effects of depreciation on BOT – $\Delta ER$ on BOT depend on $PED_X$ and $PED_M$

### 1. Depreciation of currency to correct a BOT deficit [ $\uparrow X$ competitiveness in ST]

- $\downarrow p$  of  $X$  in foreign currencies **AND**  $\uparrow p$  of  $M \rightarrow$  extent of  $\uparrow DD_X / \downarrow DD_M$  depends on  $PED$ 
  - Marshall-Lerner Condition [ $PED_X + PED_M > 1$ ]: depreciation lead to  $\uparrow BOT, \uparrow BOP$ , ceteris par.
- Caveat – depreciation  $ER_X$  address root cause of BOT deficit
  - Ex. BOT deficit due to loss in competitiveness in international markets (technologically more advanced producers); LT solution: restructuring etc., boost productivity
- Note: depreciation/appreciation used for country on floating/managed float system reduces/increases external value of its currency | devaluation/revaluation used when a country on fixed ER system reduces/increases external value of its currency

### 2. J-curve effect – $PED_M/X$ crucial in determining impact of depreciation of currency on BOT

- Initial: consumers take time to  $\Delta$  consumption pattern/substitutes,  $\Delta QD$  for  $X/M$  insignificant **AND** producers  $\checkmark$  fulfil prevailing contracts wrt volume & price of  $M/Xs \rightarrow PED_{X/M}$  low, Marshall-Lerner Condition  $X$  satisfied  $\rightarrow DD$  relatively  $p$ -inelastic  $\rightarrow \downarrow$  monetary value of  $(X - M)$ ,  $\downarrow BOT$
- Longer time period:  $\Delta$  consumption pattern, substitutes found **AND** contracts binding importers/exporters expire  $\rightarrow DD$  less  $p$ -inelastic  $\rightarrow ML$  condition fulfilled,  $\uparrow BOT$
- J-curve effect:  $\downarrow BOT$  in initial period after devaluation, followed by improvement over time

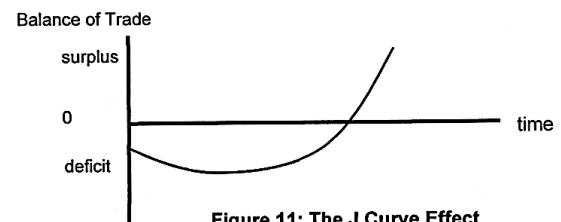


Figure 11: The J Curve Effect

## → Limitations of depreciation of S\$ policy

### A Conflicts arising from depreciating S\$

- Depreciation:  $\uparrow RNY & \downarrow UnE$  **AND**  $\uparrow M$ -inflation (macroeconomic trade-off)
- LT: poor management of inflation, wage-price spiral, lose  $X$ -competitiveness, detrimental to SG
- Note: depreciation of SGD is last resort & once-off policy to stabilise economy during severe economic recession due to weakened global DD for SG  $Xs$ ; X LT strategy

## 3.5 LIMITATIONS OF EXCHANGE RATE POLICY

### A Time lag – recognition lag, implementation lag, impact lag

- Complications – ex.  $\uparrow DD$ -pull inflation, appreciation,  $\downarrow AD \rightarrow$  take effect when  $\downarrow AD$  (unanticipated)  $\rightarrow$  unintended consequences: further  $\downarrow AD$ , ec. contracts,  $\uparrow UnE$ ,  $X$  moderate  $\uparrow$  inflation (p. stability)
- Mitigation – Central Bank formulate ER policy in forward-looking manner, evaluate impact over medium term based on reasonable assumptions of economic outlook & possible negative shocks

### B Imperfect information – MAS X have up-to-minute information about state of economy

- Latest ec. data takes time to collect & compile
- X perfect knowledge of how economy works, constant  $\Delta$  in domestic & international ec.s
- Future predictions difficult; why? lack of information & uncertainties

## 3.6 COORDINATION OF MACROECONOMIC POLICIES – ER policy X work alone in SG

- ER policy – promote price stability, foundation for sustained economic growth
- Supply-side factors – important for LR growth; ex. technological progress, capital accumulation, size & quality of labour force + DD-management policies
- Efficient coordination of fiscal, monetary & supply-side policies  $\rightarrow$  sustained economic growth in LT

### SECTION SUMMARY

- Singapore monetary policy's emphasis on the exchange rate instead of manipulating interest rates stems from the small size and openness of the SG economy
- The aim of Singapore's exchange rate policy is to achieve low and stable inflation which provides the basis for sustained economic growth
- Singapore's default exchange rate policy is modest and gradual appreciation of the SGD
- Policy of once-off depreciation of SGD is considered during a deep recession
- The exchange rate policy affects the macroeconomy through its impact on export & import prices. These, in turn, affect aggregate demand and aggregate supply

### III. SUPPLY SIDE POLICIES

#### 1. INTRODUCTION

- **Stagflation** – slow growth & high inflation; switch from DD-management to SS policies → achieve lower prices & higher output to make economies more productive

#### 2. OBJECTIVES OF SUPPLY-SIDE POLICIES & ITS IMPACT

- Achieve sustained growth without causing rise in inflation
- Improve structural LT performance, productive capacity by ↑ productivity & efficiency in economy

**DIAGRAMMATIC REPRESENTATION** – ↑ productive capacity of ec. from  $Y_{f0}$  to  $Y_{f1}$

- AS shift rightwards → potential growth **AND** ↓ unit COP, AS shift right & down from  $AS_0$  to  $AS_1$
- Key concepts – incentives, enterprise, technology, mobility, flexibility, efficiency

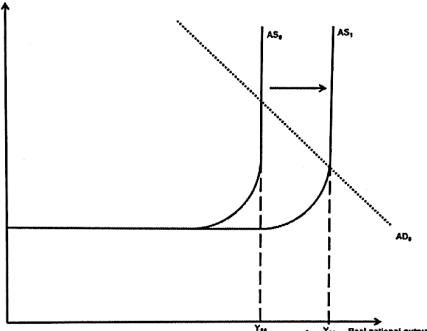


Figure 1: Rightward shift of AS Curve

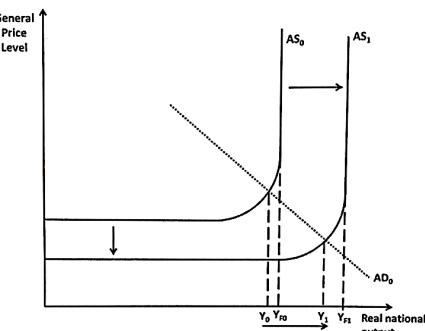


Figure 2: Rightward and downward shift of AS Curve

#### SECTION SUMMARY

- Key objective of supply-side policies is to improve the structural long-term performance of an economy
- When discussing the effect of supply-side policies, an attempt should be made to link to one of the three possible effects of the policy on the AS (on per unit COP/on productive capacity/on technology)

#### 3. TYPES OF SUPPLY-SIDE POLICIES

- Two types – market-oriented policies, interventionist policies

**3.1 MARKET-ORIENTED SUPPLY-SIDE POLICIES** – aim to reduce the role of government, enable market to work more freely by putting more emphasis on market incentives & competition; private sector ↑ freedom

##### 1. Market-oriented supply-side policies for product markets

**Product markets** – markets in which all kinds of G&S are made & traded [ex. banking, cars, pharmaceutical]

- Aim – ↑ degree of competition & efficiency in product markets

**A Privatisation** – refer to the sale, in whole or in part, of public enterprises to the private sector

- Transfer of state-owned assets from public to private sector → ↑ competition, ↑ competitive pressures, ↑ π incentive for firms to run efficiently, ↓ unit COP, AS shift down, ↓ X-inefficiency by innovating (develop new/better products or ways to produce G&S), ↑ dynamic efficiency, ↑ economic welfare [ex. new machines & technology, ↑ labour productivity]
- Caveat – regulation required; instances where ↓ I & employment due to privatisation to ↓ costs
- Ex. UK: ↓ public sector size; state-owned enterprises < 2% of GDP & < 1.5% total employment | SG: Singtel privatised in 1992; SMRT private in 1998 → more efficient operations by private sector

**B Pro-competition policies** – promote ↑ freedom & competition in private sector

- ↑ competition, ↑ firm more efficient in using scarce resources, ↑ incentive to ↓ COP & retain market share & be X-inefficient **AND** ↑ innovating & investing, new products & processes, ↑ competitive edge on rivals, ↑ productivity of FOP & ↓ COP → AS shift down & rightwards
- Caveat – reconcentration of market in LR; why? unproductive firms incur losses, leave industry | larger & better established foreign/local firms gain at expense of small local firms (globalisation)

**Example 1 – tougher competition policy regime** – policies designed to curb anti-competitive practices (ex. price-fixing cartels, other abuses of dominant position) → ↑ competition

- ↓ power of large firms to raise prices, encourages competing firms to be ↑ efficient
- Ex. Competitions & Consumer Commission of SG: 2004 Competition Act, X merge if sig ↓ competition/distorts market; exceptions if ↑ ec. efficiencies, innovation/choice/quality or ↓ costs

**Example 2 – deregulation/liberalisation** – refers to opening up of markets to greater competition

- Remove BTE to new firms (ex. patents), incumbent ↑ efficient to survive ↑ competition from newer & more innovative firms, AS shift down & right → ↑ entrepreneurship & productive capacity
- Ex. SG deregulate telecom. in 2000, Singtel X monopoly; Energy Market Authority progressively opened retail electricity mkt to comp, ↓ monopoly power of SG Power Group; 2018 Apr: Open Electricity Market enabled HH/businesses to exercise choice in buying electricity from retailer at price plan that best meets their needs

**Example 3 – promoting free trade between nations** – via reduction/elimination of tariffs/other restrictions on imports creating competition for domestic producers

- Domestic firms ↓ X-inefficient & ↑ dynamically efficient

## **2. Market-oriented SS policies for labour markets** – ↑ labour mkt flexibility, ↑ quality/quantity of labour

**A Reducing power of trade unions** – overly aggressive trade unions: barrier to free working labour mkt

- Why? push wages > market equilibrium [ex. 1970s: disruptive due to strikes]
- ↓ trade union ability to unilaterally ↑ wages, ↓ labour costs, ↑ πs & ↓ wage-push inflation → encourage ↑ investment, ↑ productive capacity of economy
- Restrictions on ability for industrial action, ↓ /X incidences of work stoppages/industrial strikes, ↓ output prevented, ↓ time lost to strikes, ↑ efficiency of firms
- Alternative: improved partnerships between trade unions & employers, ↑ productivity & flexibility of workers [ex. SG tripartite policy: harmonious industrial relations; employers: SG Employers Federation; workers: NTUC; government: Ministry of Manpower → National Wage Council]

### **B Tax cuts**

**1. Effects on labour supply** – ↓ personal Y tax, ↓ marginal tax rate

- ↑ attractiveness of work & leisure opp cost, individuals sub leisure for work, encourage ↑ work & save, ↑ workers entering workforce, ↑ incentive to be ↑ productive, ↑ employment, ↑ productive capacity, ↑ AS

**2. Effect on capital accumulation** – ↓ corporate tax, incentive for entrepreneurs to ↑ I

- ↑ net I (gross I > replacement I), ↑ capital stock in ec, ↑ productive capacity → ↑ AD w/o ↑ GPL → actual & potential economic growth (↑ full employment level), sustained economic growth
- ↑ accumulation of machines, ↑ improve capital-labour ratio, capital deepening, labour ↑ productive, ↑ output per worker, ↑ productive capacity, AS shift right
- Caveat – ↓ tax rate X sufficient to encourage FDI to ↑ productive capacity; tax-incentive wars (countries compete fiercely for foreign I & talent); political stability, conducive business environment (transparency in gov. regulations, ease & availability of credit, intellectual rights protection); ↓ T offset by ↑ other taxes

**C Cuts in welfare benefits** – Y redistribution programmes erode incentive to work

- ↑ incentive of UnE to rejoin workforce & become economically active for jobs w lower wages, ↑ labour SS effectively, AS shift right
- Caveat – dramatic solution, X well-received; why? G impt in helping economically disadvantaged & building social cohesion (esp with ↑ Y InEq)

## **SECTION SUMMARY**

- **Market oriented supply-side policies** influence aggregate supply through enabling market forces to work more freely in both product and labour markets
- Policies may have an impact on either per unit cost of production and/or productive capacity
- In product markets, such policies include privatisation, deregulation, and competition policies and encouraging entrepreneurship
- In labour markets, such policies include reducing the power of trade unions, income policies, supply-side tax reforms and reducing welfare benefits

### **3.2 INTERVENTIONIST SUPPLY SIDE POLICIES** – involve direct government intervention in markets

- Free markets X achieve desirable outcomes → gov intervention to stimulate SS improvements

#### **A Education & Training** – aim: ↓ labour market imbalances/bottlenecks via ↑ I in human capital

- Why required? Firms X willing to invest in training as benefits lost when workers leave firms; ^ ↑ skills & quality of work force, benefit society → ^ geared towards meeting needs of key industries
- ↑ skilled & efficient with machines, ↑ output per unit of input, ↑ productivity & quality of labour → ↑ productive capacity, AS shift right AND ↑ labour productivity > ↑ wages, ↓ unit labour costs, AS shift down → attract FDI, ↑ I
- Improved training opportunities (esp vocational edu) ↑ occupational mobility, ↓ structural UnE & ↓ loss of potential output, firms ↑ willing to hire ↑ productive workers, move to ↑ value-add jobs
- ↓ wage gap: Marginal Productivity Theory of Wage determination, ↑ wages of low-skilled > ↑ wages of higher skilled → ↓ Y inequality, promote inclusive economic growth

#### Examples

- Continuing Education and Training (CET) 2020 Masterplan
- Developed by the Singapore Workforce Development Agency (WDA), it outlines broad strategies for keeping our labour force competitive. The Continuing Education and Training (CET) Masterplan was also developed to enable workers to find their niches, seize opportunities in new growth areas and remain relevant and employable in Singapore's vibrant economy. In this, the government partners leading education and training providers, from both the public and private sectors, to set up quality CET centres that offer high quality and industry-relevant training courses, where Singaporeans and PRs get to enjoy 90% funding support for training programmes.
- Skills Development Fund (SDF) - Offers subsidies of up to 90% of training costs
- Applied Study in Polytechnics and ITE Review (ASPIRE) (2015) - Aims to have better structured internships for Polytechnics and ITEs with closer industry relevance
- SkillsFuture (2015):
  - SkillsFuture credit: All Singaporeans aged 25 and above will be given \$500 worth of credits to be spent on registered training and upgrading courses.
  - SkillsFuture Study Award: This is for early to mid-career Singaporeans who are committed to developing and deepening their skills in key sectors and have relevant working experience in such sectors. Recipients receive a monetary award of S\$5,000, which one can use to defray out-of-pocket expenses associated with the course that one will be taking.

#### Limitations – depends on receptivity of workers

- ↓ brain plasticity past 25 years, ↑ difficult to learn new skills; additional effort deter from retraining & skills upgrading programmes; older workers ↓ incentive as ↓ working years
- Opp cost if workers job X require higher skills & X opp for progression & ↓ productivity as workers X working while retraining, ↓ πs, ↓ employers' incentive for retraining; ↑ financial burden
- Long-term, time taken to acquire new skills & be adept

#### **B Grants to encourage R&D** – innovative activities undertaken by corporations/governments to develop new products, improve existing ones or lower the unit cost of production

- Barriers to innovation: risk aversion, uncertainty, lack of high-skilled workers, X info on tech & mkt
- Gov sponsor R&D in areas with large external benefits; why? successful R&D w technological breakthroughs ↑ productive capacity & ↓ unit COP → AS shift outward & downward
- Caveat – risks, R&D results X guaranteed, long gestation period, opp. cost
- Eval – benefits of I substantially outweigh costs → socially desirable to take risk
- Ex. Research Innovation Enterprise 2020 Plan: \$19 bil to support R&D; Research Incentive Scheme for Companies (EDB) encourage R&D (confound project costs – manpower, training, consultancy, software); gov sustain R&D spending at 1-2% GDP (comparable to US)

#### **C Encourage small business start-ups/entrepreneurship** – via ext. of loans, provision of technical expertise, support for new start-ups/small firms, remove bureaucratic red tape (↑ ease of doing business)

- Entry of innovative new firms, new technology/production method, ↑ competition, ↑ productivity, ↑ productive capacity of economy
- Caveat – high expense, effort, risk & failures deter potential entrepreneurs; ~30% fail within 3 years
- Ex. SG: Enterprise SG, Infocomm Media Development Authority IMDA, SMF, RAS offer tax incentives & grants for productivity improvement expenses (Productivity Solutions Grant) w local banks offering loans at attractive i/r under Enterprise Financing Scheme EFA

#### **D Nationalisation** – refers to the government taking over strategic industries like transport and telecommunications industries into public ownership

- ↑ financial abilities of gov vs poorly performing private firm, ↑ coordination within industry, ↑ iEOS → ↑ I than if under private ownership, ↑ productive capacity, AS shift right
- Caveat – opportunity cost of spending tax revenue; inefficiencies (X incentive to ↓ costs & disEOS)

- Ex. PUB, PSA (Port of SG Authority) are nationalised industries; why? various levels of coordination & significant iEOS reaped as operations involve large & indivisible machinery & equipment more efficiently used when larger outputs are produced

## → Other labour market policies

### Case study on Singapore:

#### Progressive Wage Model

The Singapore Ministry of Manpower (MOM) has adopted the **progressive wage model (PWM)** to provide more sustained support for lower-wage workers in order to ensure that growth is inclusive.

Under PWM, firms are mandated to pay workers in cleaning, security and landscape sectors a minimum entry-level basic wage based on their skillset. For instance, general cleaners employed under government contracts must be paid a basic wage of at least \$1,200 per month. In addition, wage ladders and training and career pathways enable workers to upskill to achieve greater career progression to earn higher wages in the future. The PWM is currently being implemented in the landscaping, cleaning, and security industries.

The PWM is deemed to be both pro-equity and pro-growth because the PWM helps to increase wages of low-wage workers through upgrading skills and improving productivity. The PWM benefits low-wage workers by mapping out a clear career pathway for their wages to rise along with training and improvements in productivity and standards. Higher productivity not only improves business profits for employers and better service standards and quality for service buyers, but also increases productive capacity of the economy. (Diagram 1)

However, the PWM is not without its limitations. Increased productivity from these low-wage jobs might be impossible to achieve due to a lack of room for increased efficiency. For instance, if a dishwasher can only wash 40 dishes an hour with current technology, then there is no way for the PWM to raise that rate to increase the dishwasher's productivity. Hence, while the PWM can lead to a reduction in income inequality, it will not improve potential growth. One way to increase the productivity of these low-wage workers is to increase the technological capabilities of that worker. This requires the industry itself to invest in better technology and to allow workers to use the improved technology after training.

### Other labour market policies

#### a. Income policies (Wage Guides/ Flexible Wages/ Wage Freeze)

The basic wage guidepost is that wage rates in all industries should be flexible, i.e. rise in accordance with the rate of increase in labour productivity in different industries. Wages are allowed to rise but should lag behind or at best, keep pace with the rate of productivity growth. This is to ensure that increase in unit labour cost is not higher than increase in labour productivity. This prevents AS from falling due to rising cost of production.

In Singapore, the NWC was designed to bring wage increases in line with national productivity growth. The NWC improved the flexibility of the labour market as it was willing to accept various wage recommendations that have helped the economy to get out of the recessions of 1985, 2001 and 2003. Voluntary wage restraints such as the 2-year wage freeze for civil servants and the reduction in employers' CPF contribution rate from 25% to 20% were used during the 1985-86 recession.

The wage structure in Singapore has variable components that allow for flexibility of wages. The Annual Wage Supplement ("13th month payment") and bonuses allow for firms to vary the annual wages of employees. In 1999, the Monthly Variable Component (MVC) was also introduced to allow wages to vary from month to month.

However, wage guides are voluntary while variable wage components are negotiable. Voluntary wage guides face the issue of non-compliance, especially since trade union leaders would have to abandon their primary objective of negotiating for higher labour wages. Thus, voluntary cooperation from trade unions may be limited. For policies such as flexible wages and wage freeze to work, workers themselves must be convinced of the necessity of such policies and accept them in view of the long-term benefits, even at short term cost. The employers must also show willingness to reinstate or increase wages in times of economic growth or improved company performance. Clear communication and cooperation among the government, employers and trade unions are essential. Singapore is one of few countries in which the above policies have been fairly successful, again due to the tripartite partnerships led by the NWC.

subsidy have a permanent effect on workers' productivity and through this channel the structure of employment and the unemployment rate.

To safeguard the livelihoods of local workers amidst the economic disruptions caused by COVID-19, the Singapore government implemented the Jobs Support Scheme (JSS). Under the scheme, wage subsidies were provided to help reduce business costs and to help viable companies tide over the crisis and minimise unemployment. Recently announced at Budget 2020, the Jobs Support Scheme (JSS)<sup>6</sup> will help enterprises retain their local employees during this period of uncertainty. Employers will receive an 8% cash grant on the gross monthly wages of each local employee for the months of October 2019 to December 2019, subject to a monthly wage cap of \$3,600 per employee. During the 2008-2009 Financial Crisis, the government launched a similar programme called the Jobs Credit Scheme which provided businesses with a cash grant. This helped to defray labour costs and encouraged businesses to retain their workers instead of laying them off in the downturn. This helps to moderate increases in the unemployment rate during severe economic recessions.

Similarly, under the Wage Credit Scheme, the government co-funds 20% of wage increments given to workers who earn less than \$5,000 a month (as of 2020 revision). This reduces cost of production of firms especially during times of recession, to reduce unemployment. With this scheme, employers are more likely to increase the wages of the low-income earners since it is co-funded by the government / keep workers employed. This will increase the wages of low-income earners / reduce the fall in income and reduce the income gap.

Measures like wage subsidies are however costly because taxpayers must face the cost of financing the wage subsidy e.g. with future tax increases. In addition, once begun, subsidies are hard to stop.

#### b. Wage Subsidies<sup>5</sup>

Wage subsidies can be defined as any transfer from the government that is able to reduce the cost of labor and/or increase take-home pay. In the market for labour, a wage subsidy increases the demand for labour which causes the wage received by workers to increase. Although the wage paid by firms fall, the workers receive a higher wage because of the wage subsidy given by the government.

One of the main reasons for providing wage subsidies include giving job opportunities to workers who would otherwise be unemployed. In the absence of wage subsidies, these workers might face long spells of inactivity or unemployment that reduce their human capital, or take on jobs that will not realize their potential productivity. Wage subsidies, in this case, have the potential to increase workers' employability through "learning by doing" and by training opportunities associated with having a job. Workers could acquire both "hard" (occupational) skills and "soft" skills, such as motivation and appropriate workplace behavior. These dynamic effects could make a temporary

## SECTION SUMMARY

- Interventionist supply-side policies involve direct government intervention in markets as that fail to achieve certain desirable outcomes
- Some examples of such policies include education & training, nationalisation and grants to encourage R&D
- Collectively, these policies may put a strain on government budgets. Thus, governments should determine the policy's suitability before putting it into action

## 4. EFFECTS OF SUPPLY-SIDE POLICIES ON THE ECONOMY

### 4.1 EFFECT ON GROWTH & INFLATION

– tech progress, capital accumulation, size/quality of labour force

- DD-pull: w/o SSP:  $\uparrow$  AD from  $AD_1$  to  $AD_2$ ,  $\uparrow$  GPL from  $OP_0$  to  $OP_1$   $\rightarrow$  ec. must achieve SS-side growth to avoid inflation  $\rightarrow$  AS shift right from  $AS_0$  to  $AS_1$   $\rightarrow$  inflation avoided, GPL returns to  $OP_0$   $\rightarrow$  actual & potential growth achieved
- Cost-push: SSP  $\downarrow$  pressures by 1.  $\downarrow$  power of unions/firms,  $\uparrow$  competition in SS labour/goods (monopoly legislation) 2. encourage  $\uparrow$  productivity through retraining/l grants to firms/tax incentives
- $\uparrow$  productivity of lower-wage workers  $\rightarrow$  inclusive growth **AND** grants for R&D, switch to cleaner production methods,  $\downarrow$  negative externalities in production  $\rightarrow$  sustainable growth

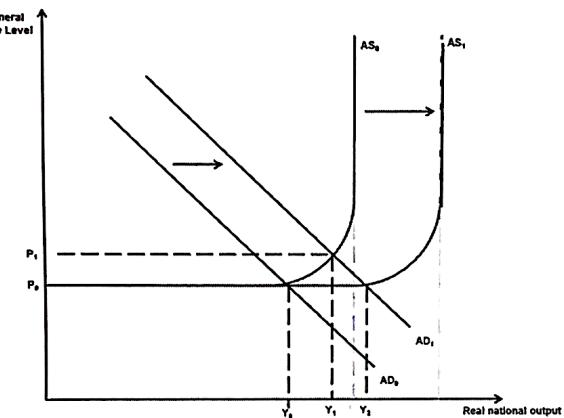


Figure 3 Sustained Economic Growth

### 4.2 EFFECT ON EMPLOYMENT

- Structural UnE (job vacancies due to skills mismatch), SSP (upgrading/training), workers  $\uparrow$  responsive to  $\Delta$  job opportunities,  $\uparrow$  adaptable & mobile when pick up new skills
- $\downarrow$  monopoly power of unions,  $\downarrow$  imperfections in labour market (strong trade unions), moderate wage increment DD,  $\downarrow$  UnE due to excessively high wage DD (firms  $\downarrow$  able & willing to employ)

### 4.3 EFFECT ON BALANCE OF TRADE & BALANCE OF PAYMENTS

- $\downarrow$  per unit COP/  $\uparrow$  product quality,  $\uparrow$  export competitiveness,  $\uparrow$  DD exports,  $\uparrow$  CA position, cet. par.
- SSP incentivise foreign firms to  $\uparrow$  I,  $\uparrow$  FDI,  $\uparrow$  Capital & Financial Account in BOP

## 5. LIMITATIONS OF SUPPLY-SIDE POLICIES

- SSP insufficient to achieve sustained growth; why? high AD for LRAS shifts to cause actual growth
- Depends on accuracy & availability of information to government; uncertain outcome
- Time lag (recognition, implementation, impact lag)  $\rightarrow$  far-sighted & stable gov
- SSP trade-offs: privatisation, pro-competition, tax cuts (  $\uparrow$  efficiency but  $\uparrow$  Y InEq – monopolies/monopsony – owners/top-level executives benefit, consumers/low wage workers X)
  - PWM encourage  $\uparrow$  productivity & skill upgrading;  $\uparrow$  costs of businesses, -ve impact COL & SG's competitiveness globally
- X effectively executed w/ intended effects if gov limited by fiscal budget; heavy political opposition
  - 2010 Greece:  $\uparrow$  gov debt; difficult, X feasible to implement edu/training programmes
- Consider policy's acceptability [  $\downarrow$  welfare benefits, politically unpopular, direct -ve impact on SR SOL]

### A General Note: The link between demand side and supply side policies

Policies can have **BOTH** demand side and supply side effects. Thus, it is important for governments to take secondary effects into account when working out their economic strategies. For example, demand management policies can have supply side effects. If a cut in interest rates boosts investment, there will be a multiplied rise in real NY (a demand side effect). But that rise in investment will also lead to increased productive capacity (a supply side effect). Likewise, many supply-side policies involve increased government expenditure. This is true for retraining schemes and R&D projects. They will therefore cause a rise in aggregate demand (demand side effect). Similarly, supply side policies of tax cuts designed to increase incentive to work and invest (supply side effect) will also increase aggregate demand (demand side effect).

**\*\* In your answers to essay or case study questions on policies, you are expected to explain the primary effect arising from the policy first while keeping the secondary effect to the synthesis / evaluative comments.**

# UNIT 7 – MACROECONOMY AIMS & ISSUES I

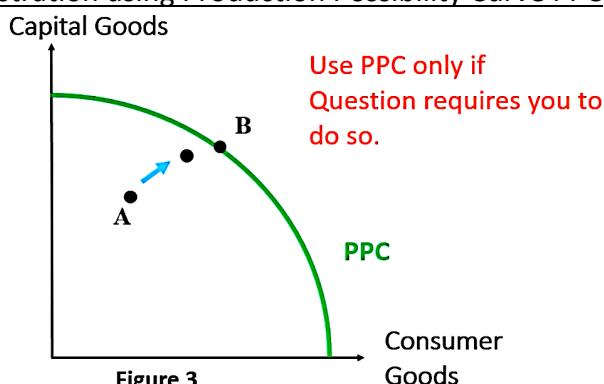
## 1. ECONOMIC GROWTH

### 1.1 DEFINITION AND DETERMINANTS OF ECONOMIC GROWTH

- Economic growth – increase in real value of G&S produced by an economy over time
    - To achieve sustained economic growth, actual growth and potential growth need to occur
- **Actual growth** – is the increase in national output actually produced for a given period of time
- Measured by percentage annual increase in real GDP
  - Determinant – aggregate demand, aggregate supply
    - ex. AD – rise in consumer confidence, consumer expenditure among households increase, shortages, stimulates firms to increase output in economy)
    - ex. AS – **fall in COP**, firms expand output at every price level, national output increase

Actual economic growth due to increase in AD	Actual economic growth due to increase in AS
 <b>Figure 1      Actual growth</b>	 <b>Figure 2      Actual growth</b> <ul style="list-style-type: none"> <li>• Specifically, a fall in COP</li> <li>• AS curve shifts down</li> <li>• No change in the vertical portion of AS curve</li> </ul>
<ul style="list-style-type: none"> <li>• Shift in AD curve to <u>right</u> from <math>AD_1</math> to <math>AD_2</math></li> <li>• Assume spare capacity, RNY increase by a multiple from <math>Y_1</math> to <math>Y_2</math> via <u>multiplier effect</u></li> </ul>	<ul style="list-style-type: none"> <li>• Increase in national output due to fall in COP</li> <li>• <u>Downward shift</u> of AS curve from <math>AS_1</math> to <math>AS_2</math></li> <li>• RNY increases from <math>Y_1</math> to <math>Y_2</math></li> </ul>

### Illustration using Production Possibility Curve PPC



- Movement of point outwards from within PPC from point A to point B
- More capital and consumer goods produced
- Note – AD/AS diagram preferred

### → Potential growth – is the long run expansion of a country's productive potential

- Reflects increase in capacity of economy to produce
- Determinant – increase in aggregate supply (productive capacity)
  - Due to increases/improvements in natural resources, capital (physical & human), technology

### Diagrammatic representation

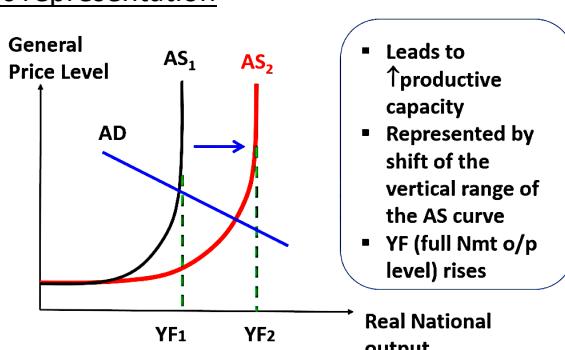
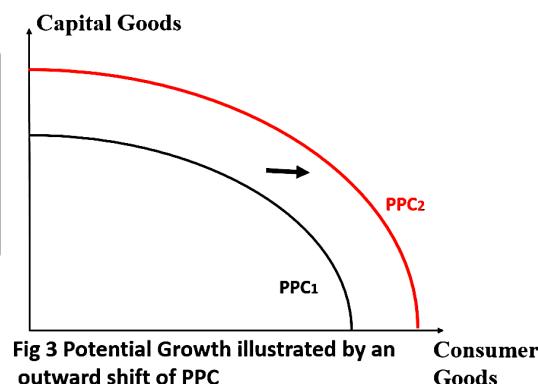
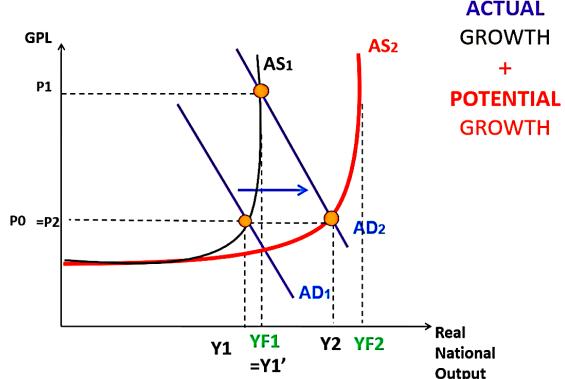


Figure 2 Potential Growth due to increase in AS



- Shift in AS curve to the right **OR** outward shift of PPC

- Result – full employment real output level increases from  $Y_f_1$  to  $Y_f_2$  (potential economic growth)
- **Sustained economic growth** – actual growth must be accompanied by potential growth



- Why rapid rise in AD X enough to ensure continuing high level of growth over no. of years
  - w/o expansion of potential output, spare capacity used up (full employment of labour & other resources) → rate of growth of actual output restricted to rate of growth of potential output/economic growth → rise in actual output eventually comes to an end
- Rightward shifts of both AD and AS curve, increase in AD supported by increase in productive capacity
  - Result – RNY increases form  $Y_1$  to  $Y_2$

#### SECTIONAL SUMMARY

- Economic growth refers to an increase in production of goods and services in an economy over time
- Economic growth can be brought about by an increase in AD and an increase in AS
- Sustained economic growth requires both actual and potential growth in an economy

**EXAM TIP! Economic growth should be explained to reflect both actual and potential growth (unless specified)**

## 1.2 BENEFITS FROM ECONOMIC GROWTH

- Importance of economic growth for an economy – results in increase in GDP
- Benefits – higher SOL, possible redistribution of income, positive impacts on other macroeconomic goals (lower unemployment rate, lower inflation rate) → impact ec. agents (hh, firms, gov)

### → A Higher current and future standard of living – material & non-material

#### Material SOL

- Actual growth leads to higher current material SOL (increase in real GDP per capita)
  - Assume population size unchanged: real GDP increases, residents have more purchasing power, more final G&S produced & made available for consumption to average individual (rise in real GDP per capita), material welfare improves
  - Ex. 3% per annum growth in per capita real GDP doubles material wellbeing in ~ 25 years; growth provides an escape mechanism from poverty for those who share in growth
- Actual growth stimulates potential growth
  - National income increases, absolute savings increase (due to higher income on induced savings effects) → increase in supply of loanable funds → LR: interest rates fall, ceteris paribus
  - Country grows, business confidence improves
  - Result – decrease in interest rates + improved business confidence → greater incentive for firms to invest with greater capital expenditure → potential productive capacity of economy increases (outward shift of AS curve) → sustained increase in real GDP → achieve higher current & future SOL for residents of economy

#### Non-material SOL – actual growth leads to improvements in nmSOL (qualitative aspects of life)

- Higher Ys: 1. afford better healthcare products & services, increase in life expectancy + fall in infant mortality rates 2. Greater ability to take time off for education, reflection & self-fulfilment (M Roberts)
- Greater ability of society to care for environment → more sustainable growth
- Greater ability of society to care for less fortunate → fall in income inequality

### → B Decrease in demand-deficient unemployment (cyclical unemployment)

- Economic growth reduces unemployment by creating jobs
- Why? economic growth, more G&S demanded & produced, greater derived demand for labour, reduce demand-deficient (cyclical) unemployment
- Importance? Unemployment is major source of social problems (crime, alienation)
- KIV – structural unemployment exists due to mismatch of skills, X reduced by ec. growth

### → C Easier to redistribute income and help poor

- Rapidly growing economy v afford to be more generous to the disadvantaged
- Why? enlarging nation's economic pie, everyone has more (poor inclusive); rise in Y due to higher economic growth, extra tax revenue, gov v spend more on transfer payments & subsidies to alleviate poverty

### 1.3 COSTS OF ECONOMIC GROWTH – if growth is persistently sharp and strong

- Problems – faster environmental degradation, resource depletion, quickened pace of life (stress-related health problems of average person), other macro-economic problems (high inflation)

#### → A Inequality of income distribution

- Growth that is uneven in different sectors of an economy propagates inequality in Y distribution
  - Real beneficiaries of growth tend to be minority rich; why?
    - Savings enable capital accumulation to occur, reap gains from investments
    - Most talented and capable in acquisition of material gain
  - Result – small section of society sees proportionally bigger rise in market value of rents & wealth, unskilled w/o wealth benefit much less from growth
  - Problem – rewards & dividends of increased prosperity X shared fairly across all segments of population, inclusive growth X achieved
- Adverse impact on individuals' health & wellbeing, and social cohesion & security → lower nmSOL
  - Research – positive correlation between degree of Y inequality & various social indicators (infant mortality, life expectancy, crime & imprisonment rates)
    - Why? excessive income inequality reduces social cohesion by weakening community life, reducing trust, and giving rise to unequal access to opportunities
  - Research – countries with higher income inequality have lower levels of Y & social mobility
    - Why? income gap between rich and poor widen + social mobility reduced → lower to middle income groups disadvantaged in health, education & job security → lower to middle income groups feel increasingly unfairly alienated → further weaken social cohesion in a country

#### → B Negative externalities and environmental costs

- Growth encourages creation of artificial needs, consumers buy things with no intrinsic need
- Higher rate of growth & consumption, greater use of raw materials, higher cost on environment
  - Ex. finite quantity of non-renewable resources (fuel, mineral deposits) rapidly depleted due to excessive mining to meet relentless consumers' demands for G&S
- Creates problems of negative externalities
  - Ex. large scale burning of fossil fuels, increase CO<sub>2</sub> content of atmosphere, harmful greenhouse effect; economic growth involving land clearing by burning → haze
  - Result – health problems (asthma), lower non-material SOL
- Problem of environmental degradation & depletion of natural resources – threaten LR ec. growth
  - Result – current pursuit of rapid ec. growth result in unsustainable rate of economic growth

#### → C Overheating economy (demand-pull inflation) – trade-offs with other macroeconomic goals

- Rapid increases in AD overheat economy (caused by components of AD)
- Occurs when AD rises excessively as economy approaches full employment (resources increasingly scarce) → inflationary pressures in the economy

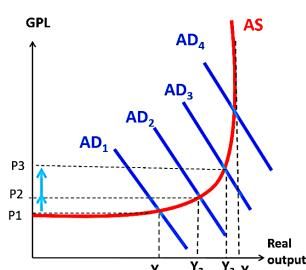
#### How demand-pull inflation occurs

- AD rises rapidly + productive capacity/AS remains constant, excess DD for goods met via overemployment of resources (employing workers for extra shifts, use machinery beyond recommended working hours) → overemployment X supported indefinitely → production X sustained
- Excessive rise in AD + lack of/limited increase in productive capacity → economy deemed to be 'overheating' → demand-pull inflation

#### Diagrammatic illustration

- Initial (Keynesian Range of AS curve) – very large increases in equilibrium real output as AD starts to rise from AD<sub>0</sub> to AD<sub>1</sub> along Keynesian range of AS curve
  - Why? vast availability of untapped resources

Fig 5 An overheating economy



<ul style="list-style-type: none"> <li>X increase in productive capacity: AS remains constant (intermediate to classical range) – continual rises in AD from <math>AD_1</math> to <math>AD_2</math> to <math>AD_3</math> <ul style="list-style-type: none"> <li>Real output increases by smaller and smaller extent over time, smaller rises in real output from <math>Y_1</math> to <math>Y_2</math>, and thereafter from <math>Y_2</math> to <math>Y_3</math></li> </ul> </li> </ul>	<p><b>c. DD-pull inflation</b></p> <p>Rising AD → more production → greater use of FOPs, fewer idle resources left → competition for FOPs. → Increase in GPL.</p>
<ul style="list-style-type: none"> <li>Classical range – AD rises beyond <math>AD_3</math> to <math>AD_4</math>, real output X rise further than <math>Y_3</math> <ul style="list-style-type: none"> <li>Why? productive capacity constrained at <math>Y_f</math>, real output X able to grow in sustained manner</li> </ul> </li> </ul> <p><u>Why demand-pull inflation is harmful to economic growth</u></p> <ul style="list-style-type: none"> <li>High inflation hurt export competitiveness + uncertainty for investors → fall in X &amp; I, reduce real Q</li> </ul> <p><u>Ex. China showing signs of overheating during the last 2 decades</u></p> <ul style="list-style-type: none"> <li>Why? experienced sharp booming exports, massive inflows of foreign direct investment + factors limit growth in productive capacity</li> </ul>	

### What is a desirable rate of economic growth?

- Impact of unhealthy economic growth rates
  - Slowdown/negative economic growth rate over time – adverse effects (recession)
    - Falling living standards, high unemployment, lack of consumer & business confidence
  - Very high growth rates – overheating (high inflation) & unsustainability
- Healthy economic growth rate – 2 to 3% for advanced economy is ideal by most economists
- Sustainable rate of economic growth** – refers to rate of growth that can be maintained without creating other significant economic problems such as depleted resources and environmental problems, particularly for future generations
  - Implies positive & stable growth rate over extended period of time

### SECTIONAL SUMMARY

- Benefits of economic growth include a higher standard of living (both current and future) and greater ability of the government to redistribute income in society
- Economic growth also achieves other macro aims of lower unemployment and reducing inflationary pressures (due to increases in productive capacity)
- Economic growth generates negative externalities and other environmental costs, leads to greater income gap in the economy
- Persistent increases in aggregate demand without increases in productive capacity in the economy may lead to other macroeconomic problems like inflation

**EXAM TIP! Explain benefits & costs of economic growth in terms of impact on relevant macro or social goals or in terms of impact on relevant consumers, firms, or government (depends on exam question & context)**

## 1.4 CAUSES OF WEAK/NEGATIVE ECONOMIC GROWTH

- Undesirable rate of economic growth involves declining/negative real growth (real output rises at a falling rate/fall in real output) → causes of weak economic growth categorised into AD and AS factors

**Aggregate demand (AD) factors** – rate of increase in AD for G&S & rate of economic growth are interrelated

- AD X expand fast enough to keep economy operating at full employment output level
  - AD must keep pace with AS to 'absorb' G&S produced, else available inputs in economy idle → lower rate of economic growth → demand-deficient unemployment is inevitable
- Factors affecting components of AD
  - Domestic origins affect C, I, G of AD
    - Ex. higher interest rates adopted by monetary authorities to curb inflationary pressures, dampen spending by households & firms → plant closures & job losses
  - International factors – external shocks bring about recessions
    - Affect investments (foreign direct investment), net export component of AD

**Aggregate supply (AS) factors** – affect quantity and/or quality of resources; affect potential & actual growth

→ A **Lack of fixed capital investment** – investment affects AS

- Physical capital** – stock of plant, machinery equipment, & buildings that are used to produce G&S
- Capital formation** – I spending in physical capital & private sector infrastructure investment

Factors necessary to increase national output → achieve economic growth

- Replace worn-out and obsolete capital in economy with the most up to date & technologically advanced plant & equipment to increase national output at satisfactory rate
  - Why? capacity of economy grows with increase in amnt of capital & improv. in productivity
- Economy must keep increasing its capital stock available to each worker
  - Capital deepening** – is the rise in ratio of capital to labour
  - Importance – increase in quantity of capital per worker increases productivity of labour → economic growth (economic growth slows down if country devotes high proportion of resources to producing consumer goods over capital goods)

Link to fixed capital investment

- Investment funds must be available for capital stock to expand → high savings rate needed (esp when there is lack of foreign investment)
- Problem – low savings rate in many developing countries → high levels of poverty + low incomes make it difficult to generate sufficient savings to provide funds needed to fund investment projects

Factors affecting savings rates in country [refer to subsequent sections for more in-depth discussion]

- Role of central banks/market forces in decreasing interest rates → discourage savings
- Erosion of traditional beliefs in virtues of savings
- Liberalisation of financial sector – ease of obtaining unsecured credit, lead to decreased dependence on savings
- Increase in level of social security benefits (healthcare subsidies), and other forms of welfare reduces need to rely on savings for retirement
- Expectations of high inflation in future might cause households to bring forward their purchases, resulting in low rate of savings
- High income tax, lowers disposable income relative to gross income, less ability to save

→ B **Lack of/fall in quantity and quality of natural resources**

- Natural resources** – are factor inputs provided by nature (land, rivers, mineral deposits)
- Increase in quantity/quality of natural resources shift AS curve rightwards
  - Ex. discovery of new mineral deposits
- Depletion of non-renewable resources & degradation of natural environment threaten potential economic growth; countries lower environmental protection standards to compete for FDI
  - Result: govs adopted policies like subsidies that encourage excessive & uneconomic use of inputs → depletion of resources + environmental degradation → risk of slower rate of economic growth in LR

- Ex. fertilizers & pesticides that pollute and destroy the environment, overharvesting of already depleted fish stocks, uncontrolled felling of trees lead to destruction of rainforest, excessive mining leads to rapid depletion of finite quantity of fuel & mineral resources
- **Policy results:** fall in quantity and quality of resources reduces productive capacity & AS over time
  - AS curve shifts inwards → steady growth in real output unsustainable in LR
- *Note – above concerns have encouraged countries to consider sustainable development and growth as their policy goal; involves commitment to less wastefulness, greater conservation, and socially responsible ways to allocate and use natural resources while pursuing economic growth*

#### → C Lack of investment in human capital

- Importance – human resources necessary to utilise natural resources & turn them into products
- **Quantity** of labour depends on size of population and average length of work week
  - Ex. SG employs foreign labour to achieve ec. growth (labour shortage + ageing population)
- **Quality** of labour force is important – improved through education & training (I in human capital)
  - Workers more effective inputs in growing economy if well-educated, trained, healthy, and motivated; must also be geographically and occupationally mobile
- **Human capital** – economists' term for knowledge and skills workers acquires through education, training and experience over time
  - Raises nation's ability to produce G&S, output per input rises, increase labour productivity → increases nation's productive capacity → push AS curve rightwards
  - How? nation's education system plays basic role in improving quality of human capital
  - Challenges – developing countries: children work to support families, X afford to attend school → skill level of labour force remains low
- Pioneering, risk-taking, inventive spirit of entrepreneurs needed (special type of human resource)
  - Importance – Joseph Schumpeter: entrepreneurship employs 'the gale of creative destruction' to replace in whole or in part inferior innovations across markets and industries, simultaneously creating new products including new business models → creative destruction largely responsible for dynamism of industries & LR economic growth
  - If replaced by security-seeking bureaucracy of managers → capitalism will decay + economic growth will be stunted
- Benefits of education & training realised in LR
  - SR: raising educational level reduces labour force + detracts from growth objective
  - LR: labour productivity (output/labour) is enhanced, improvement in economic growth

#### → D Lack of technological advancement

- **Technological advancement** – involves discovery of new knowledge, through research and development (R&D), which permits the combining of a given amount of resources in new ways to result in larger output; includes
  - New production techniques, improvements in design & performance of machines, better organisation & management processes, more efficient transport & communication systems
- Technological progress requires basic and applied research → requires tremendous investment
  - Little investment in tech – slow growth, usage of archaic production methods & equipment
  - Large investment in R&D – X necessarily see higher rates of economic growth → why? rate of technological progress depends on success of scientists & innovators
  - Result – institutional support (gov. subsidies) important → why? uncertainty of success + prohibitively high costs [note: economists differ on quantitative importance of R&D in growth process and effectiveness of gov. strategies in promoting technological advancement]

#### How invention & innovation increases economic growth

- Def: use new knowledge to provide new products/produce existing products more efficiently
- Increases output per input, reduce average cost of producing a product → raise AS
  - Ex. microcomputers & the Internet contributed to increased economic growth
  - Future areas – artificial intelligence AI (enables robots to replace human workers)

- Opens up new investment opportunities
  - How? expansion in 1 industry spread to related industries, set off chain reaction → new products created for market, induce consumers to spend
  - W/o spending, lower level of economic growth

#### → E Structural rigidities – result in weak economic growth

- Europe – rigidities in labour & goods markets detected → responsible for poor European economic performance + slowdown in productivity growth

#### Wage rigidity – refers to phenomenon where wages cannot be adjusted downwards

- Causes – labour markets characterised by strong trade union presence + high degree of coordination of wage bargaining processes + minimum wage setting; economy-wide indexation schemes & strict employment protection legislation [EU: Spain, Belgium, Germany, France]
- How? workers enjoy contracts with high employment protection (high pay and high severance payouts from firms) → high cost of production during recession where output per worker falls while wages remain constant → hard and costly for firms to hire and fire
- Result – labour rules create less dynamic economy

#### Structural rigidities in product markets [EU: Greece]

- Strong barriers to entry involving excessive regulations deter foreign investment
- High administrative & bureaucratic costs of starting businesses put off potential investors
- Result – slowing potential growth

#### Solution – undergo structural reforms

- **Structural reforms** – are reforms that contribute to removing barriers to smooth & efficient functioning of product, capital and labour markets to ensure environmental and economic sustainability of growth
  - Affect potential economic growth rate by influencing employment & productivity growth
- Aim – address deep-seated underlying inflexibilities + achieve sustainable growth patterns
- Challenges – often met with resistance → why? process protracted leaving vulnerable coping with costs of adjustments (ex. lower wages, increased unemployment, worsening income inequality)

#### SECTIONAL SUMMARY

- Negative growth (contraction of GDP) or slowdown in real growth rate to very low levels over time can be caused by factors affecting level of AS, as well as factors affecting level of AD
- Slow and weak growth can be due to rise in AD relative to AS, where productive capacity fails to keep up with rise in AD. This results in no sustained increase in real output but demand-pull inflation arises instead

## 1.5 CONSEQUENCES OF WEAK/NEGATIVE RATES OF ECONOMIC GROWTH

- Impacts on macro level & on differing economic agents
- **Recession** – defined as a fall in real GDP for two consecutive quarters
  - Fall in level of real national output produced in economy
- Impact of a recession
  - Less output produced, fewer factor inputs used → contraction in employment, unemployment rate rises, smaller percentage of capital stock at economy's disposal is used (more of economy's plants & equipment running at less than full capacity)
  - **Domino effect** – increased unemployment, drop in consumer spending, slowing growth even further, forces businesses to lay off more workers, leads to overall fall in SOL

### → A Higher unemployment

- Rise in unemployment (cyclical unemployment) occurs when an economy experiences negative economic growth
  - Why? reduced level of real output, firms hire less factors of production (including labour)
- Consequences of unemployment on individuals, governments, and society
  - Forgone output/income in the economy, strain on government budget, social problems, hysteresis (applies to demand-deficient unemployment)
  - Refer to Section 2.3 Consequences of Unemployment for detailed explanation

### → B Lower standard of living and savings

- Lower material standard of living due to lower ability to consume G&S
  - Recession associated with falling real national income, real national income per capita falls (assume no Δ in population) → fall in purchasing power of average individual in economy
  - Firms lay off workers → unemployment arises → households consume less if they are not working → lower ability to consume G&S → lower material SOL
- Lower nmSOL due to government receiving less tax revenue in period of low/falling growth
  - Why? lower tax revenue collected from personal income taxes, corporate income taxes, and consumption taxes → less funds available for government spending on healthcare & education → lowers non-material standard of living
- Level of savings in economy lower; negative level of savings among unemployed households
  - Why? lower/no income earned → households spend larger proportion of lower income on necessities → X likely have excess income to save

### → C Slower long-term economic growth due to pessimistic outlook

- Consumer confidence declines → consumers save/cut back on expenditure on G&S
  - Why? recession lead to lost output in future; spells higher unemployment & loss of income to those retrenched; workers fear possible further losses of jobs/pay cuts → bleak outlook on overall state of economy & on personal finances → consumer confidence declines
- Investor confidence declines
  - Why? households unwilling to spend, fall in business sales & revenue → firms expect lower profitability on future sale, cut back on risk taking and uncertainty → fall in investment
- Result – fall in C and I (ceteris paribus), further fall in level of AD, deepening of recession
  - Lower rate of investment and capital production lower growth in productive capacity → negatively affect economic growth in LR

### → D Lower inflation – one positive consequence of weak economic growth

- Why? country operating at full employment level + suffer from high inflation → slow growth rate, AD weakens, slow down rate of price increases
- Why beneficial? economy avoid negative impacts associated with high & unanticipated inflation
- Ex. US faced 2 serious inflationary periods in 1974-5 and 1979-81 (due to oil and wage-push factors) → each followed by recession during which inflation rate decreased → inflation rate fell from 11% in 1974 to 5.8% in 1976; fell to 3.2% from a 1980 rate of 13.5%

### → E Balance of payments (BOP) position

- Improve balance of trade in current account of BOP

- Fall in real income reduces purchasing power, consumers consume fewer G&S (including imports) → ceteris paribus, net exports increase, improve BOT in current account of BOP
- Worsen investment sentiments, cause foreign investors to withdraw businesses from country
  - Ceteris paribus, net outflow of capital funds, worsen capital & financial account of BOP
- Net impact on BOP position – depends on above impact on BOT and KFA account

#### SECTIONAL SUMMARY

- A slowdown or negative economic growth rate may result in lower standard of living as well as other macro problems such as high unemployment
- A slowdown in growth may, however, reduce inflationary pressures on the economy, if the economy was operating at full capacity with few idle resources

**EXAM TIP!** Consequences of weak economic growth are many; may be explained in terms of impact on macro or social goals, or in terms of impact on relevant consumers, firms or government; how these effects should be explained depends critically on how given exam question is phrased + context of given question

**1.6 INCLUSIVE GROWTH** – indicates a rate of growth that is sustained over a period of time, is broad-based across economic sectors, and creates productive employment opportunities for the majority of the country's population; economic growth takes Y distribution into consideration, X contribute to worsening Y inequality

**Why economies face challenges in achieving inclusive growth as it grows & develops**

- Fruits of growth X equitably distributed

Ex. SG no exception

- SG grew in last 2 decades, share of total income rise X evenly distributed among different groups of Singaporeans → rewards mainly go to successful businessmen, entrepreneurs, innovators; rest of SG enjoyed smaller share of economic pie
- Challenges faced – more difficult for lower to middle income groups to achieve income mobility
- Challenges faced in narrowing income gap – globalisation, increased competition, lack of relevant skills of low-skilled workers, decline in productivity gains due to heavier reliance on foreign labour inputs to generate economic growth
- Policies put in place by SG gov
  - Productivity-driven growth is means to deliver inclusive ec. growth → put in place policies to help increase productivity of workers
  - Tax rebates + increased subsidies on healthcare & education → alleviate cost burden of lower- and middle-income groups + facilitate social mobility
  - Refer to Section 5.7 Market Failure & Government Intervention, Fiscal Policy for more details
- Future – policymakers focus on ensuring greater & more even distribution of economic pie across different segments in society in positioning itself for next phase of economic development

#### 1.7 SUSTAINABLE GROWTH AND DEVELOPMENT

**Sustainable growth** – involves rate of growth that can be maintained without creating other significant economic problems such as depleted resources and environmental problems, particularly for future generations; implies positive and stable rate of growth over an extended period of time

- World Bank (over past 2 decades): economic growth raised incomes for many at the expense of environment & poorer communities
- Why? market, policy & institutional failures contributed to resources being used in economically inefficient and wasteful ways, X account for true costs of resource depletion
- Ex. burning of fossil fuels supported rapid growth globally for decades → set stage for adverse consequences of climatic change today, threaten to rollback decades of development progress
- Ex. growth patterns left hundreds of millions of people behind: 1.2 billion lack access to electricity; 870 million are malnourished; 780 million without access to clean, safe drinking water

## 2. FULL EMPLOYMENT AND UNEMPLOYMENT

### 2.1 DEFINITION (point on the PPC)

- **Full employment** – all FOPs (land, labour, capital, entrepreneurship) fully & efficiently utilised
- **Unemployment** – situation where people who are available for work and are actively seeking work cannot find jobs; governments aim to achieve full employment & low unemployment rate

### 2.2 TYPES (CAUSES) OF UNEMPLOYMENT – 3 types: demand-deficient/cyclical, structure, frictional

#### 1. Demand-deficient/cyclical unemployment – caused by fall in aggregate demand

- Associated with economic recession: deeper the recession, higher cyclical unemployment
  - National income falls for at least 2 consecutive quarters/steep slowdown in growth → lack of demand for G&S → lack of production activities → lack of demand for labour/job vacancies as firms are unable & unwilling to offer jobs → unemployment
- Why cyclical? Recessions and recoveries occur in business cycles
- Why cyclical UnE is SR? reduced during upward swing of business cycle (ec. recovery & growth)

#### Process

- Fall in AD associated with recession,  $AD_1$  shifts to  $AD_2$  → contraction in output across many industries
- Firms hire less FOPs (including labour) to cut costs & maintain profits (labour shedding/downsizing) → lower level of national output → labour is derived demand, demand for labour falls
- Less jobs created, more workers laid off → spare capacity in economy
- Result – real national output (RNY) lowered (depicted by difference between  $Y_1 (=Y_f)$  and  $Y_2$ )

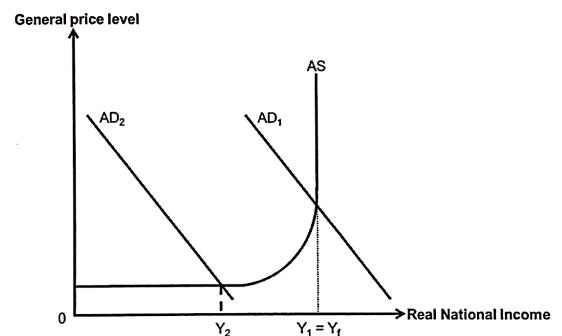


Figure 8: Demand-deficient unemployment

#### 2. Structural unemployment – X caused by business cycle; long-term, chronic, economy X in recession

- Definition: mismatch of skills between unemployed & skills required by producers seeking labour

#### External processes/events triggering fundamental changes in the economy causing ^

##### → A Changes in pattern of demand ( $\Delta$ taste and preference/invention of substitutes) ↑ ↓

- **Sunset industry:** production gradually decreases, DD for labour falls, unemployment → unemployed workers struggle to relocate to new industries where very different skills required + pessimistic outlook on chances to learn new skills in high-tech industry
- Ex. boom in natural gas as alt electricity, ↓P of natural gas due to new extraction technologies + environmental problem of coal (most C emissions of any fossil fuel used in electricity) + ↓ P of renewable power sources (wind & solar) → ↓ DD coal, mines closure in US/UK/China, many miners X formal qualifications & relevant skills to find work (ex. service sector) → struggle to find work
- Ex. SG: progressive downsizing of local electronic industries (prefer cheaper M electronics), X find jobs, most jobs offered in industries producing high-tech G&S (info tech)

##### → B Foreign competition ( $\Delta$ comparative advantage)

- Why? same jobs move to different location, workers X follow; globalisation, free trade
- Ex. manufacturing jobs move from high-wage to low-wage countries (ex. China, India, Bangladesh), cheaper labour due to larger population base → companies relocate manufacturing facilities → manufacturing workers in developed countries become unemployed → structural unemployment
- Ex. emerging market economies: farmers – free trade, global food corporations access markets → small-scale farmers X compete with lower prices → head to cities to search for work

##### → C Changes in technology (due to advancement of technology)

- Firms constantly innovate processes, more labour-replacing technologies,  $\Delta$  methods of production, workers must upgrade skills (V operate latest production machineries)
- Problem – difficult, takes a long time → workers lack new skills, structural unemployed
  - Job vacancies may exist, but firms only offer to workers with relevant skills → occupational immobility (lack of ability & willingness to take up new jobs as X skills to benefit the occupation)
  - Causes – lack of/unwillingness to receive training; ineffective due to steep learning curve

- Ex. newspaper industry: ↑ web-based advertising, online news media → ↓ newspaper employees (journalists, printers, delivery route workers) → new training required

→ D **Geographic immobility** – lack of ability or willingness of people to relocate within country for a job

- Person with relevant skills in another industry concentrated in another region (skills X relevant in locality) unwilling/unable to relocate → Why? high financial costs in moving (selling + renovation), renting property, cost of living, family & social ties at place of birth
  - Greater occupational/geographical immobility of labour, more severe structural UnE
- Ex. ↓ coal-mining industry in South Wales, high UnE in Welsh valleys, ✓ move to England with coal-mining activities

**3. Frictional unemployment** – unemployed workers take time to search for jobs, remain UnE in meantime

- Why 1? market imperfections, imperfect information for job search → 1. workers ignorant of all available job opportunities 2. Firms X know what labour is available → ✓ time to find right job match
- Why 2? Dynamic economy, jobs continually created & destroyed, workers entering & exiting labour force → frictional UnE → job search is efficient (why? better match between workers' skills & skills necessary to carry out productive tasks) + X severe, short duration only
- Occurs for new entrants to labour force (fresh graduates), transitioning between jobs

**SECTIONAL SUMMARY** – 3 main types of unemployment

- Demand-deficient unemployment – due to deficient demand in economy
- Structural unemployment – due to structural changes in the economy resulting in a mismatch of skills between unemployed and job vacancies
- Frictional unemployment – due to imperfect information

**2.3 CONSEQUENCES OF UNEMPLOYMENT** – negative impacts on HH, firms, gov.

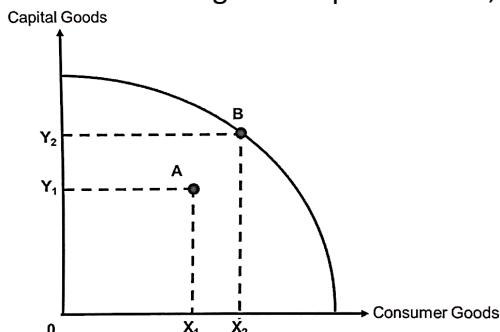


Figure 9: Loss of output in society due to unemployment

→ A **Forgone output/income in economy & lower living standards**

- Why? UnE: wastage of scarce resources, loss of potential output for ec., deprived of higher Q
  - Produce at point within PPC, X on PPC (higher output)
- Process: HH – ↓ Y (UnE individuals/ ↓ wages, job-seekers compete for jobs, ↑ SS of jobs/ labour), ↓ PP, ↓ material SOL | ↓ ability to purchase essential services (healthcare), ↑ stress, ↓ nmSOL
- Result 1: decrease in C – limits attainment of ec. growth (key macroeconomic aim), ↓ output & Y, ↓ expenditure, ↓ quantity of G&S available for consumption, ↓ material SOL
- Result 2: decrease in I – ↓ consumer expenditure, ↓ production level due to ↓ DD, greater spare capacity, ↓ incentive for firms to invest in capital goods for further production, ↓ investment

→ B **Strain on government budget**

- Why? UnE X Y, X pay income tax → ↓ tax revenue, higher expenditure on UnE benefits & welfare payments + management of social problems (ex. crime)
- Result – limited amounts of money in gov budget handed out to idle people/avoid social problems instead of being put to productive use → cost to society

→ C **Social problems (affect non-material standard living)**

- ↑ incidences of deviant behaviours & crimes theft, alcoholism, depression, child abuse, suicides
  - Why? turn to stealing & robbery to survive

- ↑ stress levels → why? unable to gain employment/employed worried about keeping jobs
  - ↓ self-esteem & ↓ personal relationships
- ↑ income inequality exacerbated when UnE rates X evenly distributed across country
  - Polarisation between high Y, low UnE & low Y, high UnE → social & political unrest → destabilise economies

→ D Hysteresis (**demand-deficient unemployment**) – UnE persists when ec. recovers, ↑ DD, X deficient

- Why? Protracted UnE deskill & demoralise retrenched workers, workers X readily employable even when ec. recovers → ↓ productivity → ↓ productive capacity, ↓ potential output in LR

#### SECTIONAL SUMMARY

- In theory, full employment occurs when all resources are fully and efficiently utilised to produce the maximum output an economy can produce
- In reality, full employment refers to the situation when all labour resources who are willing and able to work, and are actively seeking work, have found jobs. It is achieved when the natural rate of unemployment is attained. This is a positive and low rate that includes structural and frictional unemployment.
- Unemployment indicates wastage of resources that results in a lower production, greater strain on the government, and more social problems

**EXAM TIP! Consequences of UnE can be explained in terms of impact on other relevant macro-goals like economic growth or in terms of impact on relevant households, firms, or government. How these effects should be explained depends critically on how the given exam question is phrased.**

### 3. INFLATION AND DEFLATION

- Ex. Venezuela (hyperinflation 10 mil %), Zimbabwe, South Sudan, Argentina, Hungary, Brazil, Turkey
- Shock therapy (price controls, gov. subsidies, higher tax rates, lower gov spending to reduce budget deficits, devaluing currency to boost foreign investments, selling state-owned industries to private sector)

**3.1 DEFINITION:** Inflation is a situation where there is a sustained increase in the general price level

$$\text{inflation rate}_{\text{current year}} = \frac{\text{CPI}_{\text{current year}} - \text{CPI}_{\text{previous year}}}{\text{CPI}_{\text{previous year}}} \times 100\%$$

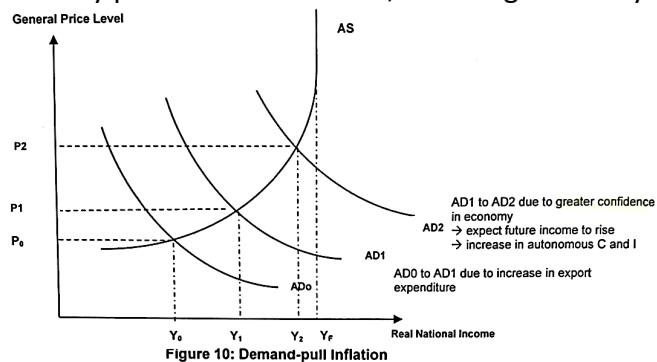
### 3.2 TERMS ASSOCIATED WITH INFLATION

- Mid/low inflation** – inflation rate that is single digit and does not distort relative prices severely
  - Central Banks set an inflation target around 2% to 3%
- Galloping inflation** – price level increasing at a higher rate at double or triple digits hence causing money to lose its value at a rapid rate
- Hyperinflation** – extremely high (more than triple digit) rate of inflation
  - Lose confidence in currency (cease to function as medium of exchange), barter trade
- Disinflation** – slowing rate of price increases or falling inflation
- Deflation** – falling prices or negative inflation
- Stagflation** – period of rising prices coupled with no or negative growth in real GNP/GDP and high or rising unemployment
- Anticipated inflation** – inflation rate is steady and expected
  - Individuals and businesses  $\checkmark$  accurately predict inflation will take place
- Unanticipated inflation** – inflation that is volatile and unexpected
  - Inflation is volatile from year to year; difficult for individuals and businesses to correctly predict rate of inflation for near future; ec. agents make errors in inflation forecasts, actual inflation significantly above expectations

**3.3 CAUSES OF INFLATION** – two main types of inflation: demand-pull inflation, cost-push inflation

**1. Demand-pull inflation** – sustained increase in GPL caused by persistent rises in AD; booming economy

- AD curve continually shifts right
- Sources – non-GPL factors: autonomous C, I, G, ( $X - M$ ), monetary/fiscal stimulus to economy, positive expectations about future Y & sales, rising property prices, expectations about inflation, economic growth in other countries



#### Process of demand-pull inflation

- $\uparrow$  value of autonomous ( $X - M$ ),  $\uparrow$  AD, rightward shift of AD, shortages in ec. as current spending exceeds current production levels at initial GPL  $P_0$   $\rightarrow$  assume ec. operating along intermediate range of AS, ec. approaches full employment, FOP (labour, raw material) scarcer, competition for scarce resources cause firms to bid up factor price, each additional unit of output more costly to produce,  $\uparrow$  price & output to remain profitable  $\rightarrow$   $\uparrow$  GPL from  $P_0$  to  $P_1$  and  $\uparrow$  RNY from  $Y_0$  to  $Y_1$
- Ex. HH & firms  $\uparrow$  confidence in future ( $\uparrow$  Y and sales),  $\uparrow$  incentive buy & invest more,  $\uparrow$  autonomous C & I,  $\uparrow$  AD,  $\uparrow$  GPL persists over time  $\rightarrow$  higher demand-pull inflationary pressure
- Extent firms  $\uparrow$  P depends on spare capacity in economy
  - Lower level of RNY/Q – available spare capacity, firms easily expand Q to meet  $\uparrow$  DD, X  $\uparrow$  P
  - Higher level – closer to full employment, each additional unit of Q costlier to produce, much larger  $\uparrow$  P to ensure profitable production, AD continuously shifts right, high rate of inflation

**2. Cost-push inflation** – sustained increase in GPL caused by persistent falls in AS; independent of AD level

- AS curve continually shifts upwards or leftwards

- Sources – ↑ P of raw materials, wage-push inflation, import-induced inflation, tax-push inflation, profits-push inflation

**Process of cost-push inflation** – GPL increase must persist for inflation to occur

- ↑ P of oil, ↑ COP, AS curve shifts upwards, shortages at prevailing price, firms ↑ P, ↓ RNY (wealth, interest rate, international trade effect), ↑ GPL to eliminate shortage and ↓ RNY from  $Y_0$  to  $Y_1$
- Workers expect ↑ P, ask for ↑ nominal wages to maintain PP, further ↑ COP, further upward shift of AS curve → ↑ GPL further, higher cost-push inflationary pressures

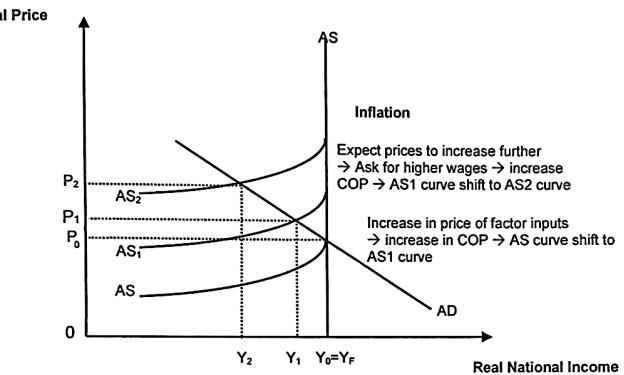


Figure 11: Cost-push Inflation

#### Sources of cost-push inflation

##### → A Inflation due to exhaustion of raw materials (ex. Al, Cu, Fe, steel, P, coal, oil, natural gas)

- Finite raw materials, exhausted if continually used → ↓ SS, ↑ P of major FOP, ↑ COP → to maintain profit margins, firms pass ↑ COP to consumers, ↑ consumer prices → ↑ GPL sustained, cost-push inflation
- Ex. oil used in production of wide range of G&S (plastics, petrochemical products, fuel) → severe shortage in oil markets (1973, 1978, 1999) → ↑ COP, sharp burst of cost-push inflation

##### → B Imported-induced inflation – inflation exists through higher import prices

- SS shortage/weak external value of currency (depreciation)
  - ↑ P of imported raw materials in domestic currency, ↑ COP G&S, upward shift of AS, firm pass ↑ COP to consumers in form of ↑ P OR ↑ P of imported final G&S, ↑ cost of living
  - ↑ sustained GPL → cost-push inflation (damaging for M-reliant countries – SG)
- Ex. 1973 – 1974: 1973 oil crisis, OPEC oil embargo, SG inflation due to ↑ import P (fuel) | 2021 Oct: 3.2% overall inflation, highest in > 8 years (rising M prices of global food commodities + energy P)

##### → C Wage-push inflation (greater part of TC → cost-push inflation primarily a wage inflation process)

- ↑ Trade union market power, ↑ wages > ↑ labour productivity, ↑ COP, firm pass on ↑ cost to consumers, ↑ GPL sustained → cost-push inflation
  - More severe when ec. closer to full employment, greater problem of skill shortages
- Result – **wage-price spiral**: ↑ wages, ↑ P of G&S as firms protect π-margins as ↑ cost → wage-earners prevent ↓ real wages, push nominal wages ↑ → vicious cycle: wage chase P, P chase W
  - Also caused by rise in AD + near full employment (due to SS shocks/oil P hike)

##### → D Profits-push inflation

- Dominant firms use market power for ↑ profits, ↑ P above COP & independent of consumer DD
- If concentration of ec. power (firms/union ↑ dominant), cause wage-price spiral

##### → E Tax-push inflation

- ↑ GST, ↑ production cost, ↓ AS → firms pass ↑ COP to consumers via ↑ P to maintain π margins

#### SECTIONAL SUMMARY

- Demand-pull inflation** is caused by continually rising AD, while AS remain constant or increasing at a slower rate. It is illustrated by persistent rightward shifts in AD along the intermediate to classical range of the AS curve. Factors affecting the components of AD (such as C, I, G, X) cause demand-pull inflation
- Cost-push inflation** is attributed to higher unit costs of production which leads to a fall in AS and is reflected by the AS curve shifting upwards
- It is possible that an initial inflation can result in a **wage-price spiral**, especially when an initial inflation causes cost of living to rise, and trade unions respond by demanding higher nominal wages for workers to maintain their real wage. Should firms succumb to the pressures of trade unions, firms face higher unit costs (assuming constant productivity), and AS falls (AS curve shifts up), resulting in an even higher GPL

### 3.4 BENEFITS OF LOW AND STABLE/ANTICIPATED INFLATION

#### → A Promotes investment and in turn potential economic growth

- Low & stable inflation, easier to predict  $\Delta$  COP, P and  $\pi$  more accurately, LT planning easier → greater certainty, ↑ willingness to enter LT contracts (as X expect ↑ P of FOP) → ↑ I
- ↑ I → ↑ capital stock, ↑ productive capacity & AS (outward shift of AS) → ✓ potential growth
  - Accompanied by dampening of inflationary pressures, enhance ec. growth

#### → B Promotes international competitiveness and improve BOP

- **BOP** – record of receipts & payments arising from country's transaction w rest of world over period of time
  - BOP = CA (BOT and Y balance), KFA (flow of funds from FDI & portfolio I)
- **International competitiveness** – price competitiveness & quality of exports; attractiveness of host country in attracting inward FDI & foreign talent
- Domestic inflation < foreign inflation: improve p competitiveness of X, foreign countries ↑ DD for relatively cheaper X, ↑ X revenue + ↓ DD by domestic HH of relatively more expensive M (sub with domestically produced substitutes), ↓ M expenditure → BOT in CA of BOP improve, ceter. par.
- Greater FDI by foreign investor: greater certainty in real returns of investment, encourage foreign investors to enter ec., ↑ level of inward FDI → ↑ KFA surplus in BOP, BOP improve

#### → C Promotes sustained economic growth and lower unemployment

- HH expect slow ↑ P, X incentive to hold back purchases of consumer G&S, healthy C level
- ↑ C, I, X → ↑ AD (shift right) → if ec. operating below full employment + spare capacity, ↑ autonomous AD, more than (k) ↑ RNY (k effect) → ↓ cyclical UnE (labour is derived demand)
- ↑ I, ↑ capital stock, ↑ productive capacity, AS shift outwards → potential economic growth

#### → D Economic agents take actions to protect themselves to maintain current and future SOL

- Mild inflation rate, value of dollar eroded slowly
- Anticipated inflation: ✓ protect against rising inflation, ↓ cost of inflation, ✓ domestic savings
  - Savers – maintain future SOL: put funds in financial instruments offering nominal interest rate ≥ expected inflation rate → maintain real i/r & future value of savings
  - Workers – ✓ negotiate contracts where ↑ nominal wage ≥ inflation → real wages, PP, SOL rise or maintained

#### → E Improve efficiency in resource allocation – prices provide important signal to guide Q

- Low stable inflation, ec. agents recognise  $\Delta$  relative p between different G&S more easily (X confused by overall p level) → more well-informed decisions + allocate resources more efficiently
- Promotes efficient use of productive investment (new machinery, equipment)
  - ↑ real GDP, productivity, ↑ new G&S in future
  - Why? X spend substantial time & resources to defend themselves from high inflation (ex. existing residential housing, bonds, stocks are unproductive/speculative as X ↑ real GDP)  
→ ↑ productive investments → better alloc. of resources → ✓ actual & potential growth

#### → F Increases leeway for Monetary Policy

- Monetary policy – use of money SS & i/r to change level of economic activity
- Mild inflation – ↑ leeway for MP → how? recession + positive inflation rate, ↓ nominal i/r below inflation rate, negative real cost of borrowing, borrowing stimulated, boosts growth + spending
  - Moderate inflation ensures nominal i/r stays sufficiently above zero

### 3.5 COSTS OF HIGH AND UNSTABLE/UNANTICIPATED INFLATION – GPL rising rapidly over time + volatile

#### → A More difficult to protect material SOL

- Inflation, ↓ value of money, ↓ real Y, ↓ PP if nominal Y  $\leq \uparrow P$ , sig. deterioration in material SOL

#### → B Reduces investment which hinders potential economic growth

- Cripples LT business planning: uncertainty about future P of FOP & profitability of I projects → ↓ willingness to take risks, ↓ I, ↓ capital stock, ↓ productive capacity (AS shift left), ↓ potential eg
- HH unsure of future value of savings, ↓ incentive to save, ↓ savings in economy, ↓ SS of loanable funds, ↑ i/r, ↓ I yielding r  $\geq$  higher i/r, ↓ potential economic growth

#### → C Reduces international competitiveness and worsens BOP

- ↑ Domestic inflation > foreign inflation: ↓ price competitiveness of domestic X, ↓ X revenue + HH  
↑ DD relatively cheaper M, ↑ M expenditure → BOT (X - M) position worsen, ceteris par  
○ ↑ BOT deficit, ↑ CA deficient, ↑ BOP deficit, ceteris par
- ↑ + unstable inflation is signal of internal economic instability: ↑ uncertainty, ↓ business confidence, ↓ capital preservation of FDI → why? ↑ P, ↑ cost, ↓ πs, ↑ uncertainty in real returns of I, discourage investors from entering economy, ↓ inward FDI → ↑ deficit in BOP, worsening BOP, ceteris par

#### → D Difficulty in sustaining economic growth

- ↓ I and X, ↓ AD → more than proportionate fall in RNY via multiplier effect, ↓ actual economic growth, ↑ demand-deficient unemployment
- ↓ I → ↓ productive capacity & AS, ↓ potential economic growth, difficult to sustain ec. growth
- ↑ speculative activity → X benefit economy, fuel unsustainable ↑ residential housing → exaggerated expectations of gains from investing encourage borrowing to finance purchase → when P collapses, borrowers default on loans, banking crisis → hurts growth
  - Why? diversion of efforts from productive activities (shoe-leather costs)
  - Shoe-leather costs – opp. cost of time & effort to counteract effects of inflation by minimising holdings on cash, frequent trips to banks, wear out shoes (↑ inflation, ↑ cost)

#### → E Arbitrary redistribution of income worsening income distribution

- Unanticipated inflation, difficult for Y receivers to adjust nominal Y to account for inflation rates → ↓ ability to mitigate adverse effects, ↓ real income

#### Fixed income earners suffer vs variable income earners benefit

- Fixed income earners – nominal Y X increase with inflation, ↓ real Y, ↓ buy fewer G&S
- Variable income earners – Y directly related to P, ↑ P  $>$  ↑ COP, ↑ πs
  - Equity holders – benefit; ↑ πs by producers, ↑ dividends paid to equity holders

#### Workers in stronger trade unions benefit

- Strong trade union support, X declining industry, ↑ nominal wages  $>$  ↑ GPL → benefit

#### Debtors (borrowers) benefit, creditors suffer

- Unanticipated inflation, uncertainty, ↓ ability to protect against inflation
- Creditors – ↓ burden of debt, principal sum ↓ in terms of PP
- Debtors – pay back ↓ interest in real terms

#### Holders of physical assets (houses, land gold) benefit, holders of financial assets lose out

- Physical asset holders – money value of assets Δ directly with price level
- Financial asset holders – Y received in real terms declined, i/r payments X adjusted w inflation

#### → F Significant Menu Costs (cost of constantly revising and reprinting price lists as firms adjust P of G&S)

- ΔP of G&S more frequently, ↑ menu cost incurred → ↑ COP, AS shift upward, firms pass cost to consumers, ↑ P, aggravate cost-push inflation
- Assume constant Y, ↑ GPL, ↓ ability to buy consumer G&S, ↓ material SOL
- Ex. – update computer systems, retagging items, hiring consultants to develop new p strategies

#### → H Hinders efficient resource allocation

- Difficult to distinguish  $\Delta p$  of specific product &  $\Delta$  overall price level
- Result – producer mistake  $\uparrow$  GPL for  $\uparrow P$  of own product, devote more resources, inefficient alloc.

#### → I Wage-price spiral causing breakdown in functions of money

- Hyperinflation:  $\uparrow P$  by  $\sim 100(0)\%$ , undermine basis of market economy
- Firms  $\uparrow P$  to cover  $\uparrow COP$  + workers demand  $\uparrow$  pay due to  $\uparrow$  cost of living  $\rightarrow$  wage-price spiral  $\rightarrow$  HH X save money, spend before value  $\downarrow$  OR barter to avoid using money OR use foreign currency with lower stable rate of inflation

#### SECTIONAL SUMMARY

- High inflation implies that GPL rises rapidly to the extent that  $P$  increases cannot be easily anticipated by economic agents like consumers and producers
- High and unanticipated rate of inflation have several undesirable consequences. For example, high inflation can slow economic growth and cause unemployment due to lower AD (due to fall in X and I) owing to loss of export competitiveness and lack of certainty respectively. High inflation can cause BOP problems too when X and FDI are adversely affected
- In view of the several undesirable consequences of high and unanticipated inflation, governments in general aim to achieve a low rate of inflation, whereby prices rise at a slower rate and in a more predictable manner. Some governments have even chosen low inflation to be the top priority aim, because the attainment of low inflation can help the economy attain other macroeconomic aims
- Whether inflation is a cause for concern depends on the level and duration, its causes, anticipated or unanticipated, comparison to other countries

#### 3.6 DEFLATION – occurs when there is sustained decrease in GPL (negative rate of inflation)

- Deflation  $\neq$  disinflation (inflation rate declines to lower levels)

#### Causes of deflation

- AD falls (ex.  $\downarrow$  domestic C,  $\downarrow$  foreign demand for exports)
- AS increases (ex.  $\downarrow$  oil P,  $\downarrow$  COP | tech rapid growth,  $\downarrow P + \uparrow Q$ ,  $\uparrow$  productivity; benign inflation)

#### Consequences of deflation – relief for consumer; serious problem for economy if deflationary spiral

##### → A Deflation is not undesirable from following perspectives

- Good for individuals: assume money Y constant,  $\downarrow$  GPL,  $\uparrow PP$  + ability to consume G&S,  $\uparrow SOL$
- When caused by  $\uparrow$  productivity of workers & firms,  $\downarrow$  COP (AS shift downward or outwards)

##### → B Deflation is undesirable from following perspectives

###### 1. Deflationary spiral develops

- HH expect  $\downarrow P$  in future, hold back purchases,  $\downarrow$  autonomous C, AD shift left
- Firms expect  $\downarrow$  sales in future,  $\downarrow I$ , AD shift left
- $\downarrow$  autonomous AD, more than proportionate  $\downarrow RNY$  via k effect,  $\downarrow$  actual growth, ceteris par.  $\rightarrow$  recession  $\rightarrow$   $\uparrow$  demand deficient UnE (labour is derived DD)  $\rightarrow$  deflation leads to negative spiral where consumers  $\downarrow$  expenditure, firms  $\downarrow$  profitability & shut down  $\rightarrow$   $\uparrow$  UnE, further  $\downarrow C$

###### 2. Increases real burden of debts – nominal interest rate of debt fixed

- $\downarrow Y$  and  $P$ ,  $\uparrow$  real burden of debts,  $\downarrow$  consumer confidence + willingness to spend

###### 3. Deflation harder to solve than inflation – i/r reflects price of consumption today relative to tomorrow

- High i/r, savings worth more tomorrow [**real i/r = nominal i/r – expected inflation**]
- Combat high inflation –  $\uparrow$  nominal i/r
- Combat recession (inflation  $> 0$ ) –  $\downarrow$  nominal i/r below inflation, real cost of borrowing negative,  $\uparrow C$  and  $I$  (borrow free money)
- Deflation (zero/negative) – X lower nominal i/r below zero (why?  $\downarrow$  savers' bank deposits), real i/r always positive, impossible for Central Bank to intervene using i/r policy  $\rightarrow$  real cost of borrowing higher, affect interest-sensitive spending by firms & HH  $\rightarrow$  MP X work  $\rightarrow$  deflation track

## SECTIONAL SUMMARY

- A deflation can be caused by persistent fall in AD or continual rise in AS
- A deflation caused by falling AD brings about falling GPL and is usually regarded in bad light. This is due to negative/falling rate of economic growth and higher demand-deficient unemployment that comes with falling AD
- However, deflation due to rises in AS (due to fall in unit costs) may be considered good, because falling GPL is accompanied with a rising real output
- Deflation can be good for the individual, but if everyone reduces their spending, then companies could fail, and people could lose their jobs
- Still, whether a deflation translates into undesirable consequences over time depends greatly on consumers' and producers' expectations on price falls

## 4. EXCHANGE RATES & BALANCE OF TRADE

- External stability – stability in exchange rates ER and favourable balance of trade BOT
- Importance of ER stability – facilitating international transactions between countries
  - Operate on fixed or managed float ER
- Favourable BOT – avoidance of large and persistent BOP deficits and surplus

### 4.1 EXCHANGE RATE DETERMINATION – TYPES OF EXCHANGE RATE SYSTEMS

**Exchange rate** is the price of one country's currency in terms of another currency or a basket of foreign currencies; countries adopt different exchange rate systems

#### 1. Free-floating exchange rate system

- Market exchange rate determined by interaction of market DD and SS of country's currency in the foreign exchange market (FOREX market)
- No intervention by Central Bank; QD always equal QS

#### → Demand for currency

##### 3 main sources of DD for US dollar by foreigners

- Foreign firms/consumers buying G&S produced in US
  - Foreign firms/HH investing in US FDI – 1. Buying/building production facilities 2. Foreign portfolio investments (buying financial assets issued in US)
  - Currency traders (speculators) – expect US dollar to appreciate against foreign currencies
- DD curve downward sloping;  $\downarrow P$  of domestic currency,  $\uparrow QD$  of US\$ as US exports become cheaper +  $\downarrow$  cost of I + speculators (buy low sell high) expect US\$  $\uparrow$ , ceter. par

Price of US\$ in terms of S\$

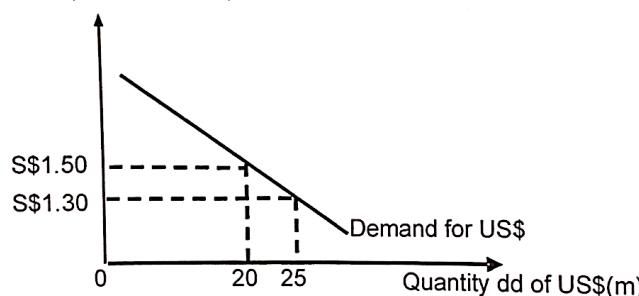


Figure 12: Demand curve for US\$ in the Forex market

Price of US\$ in terms of S\$

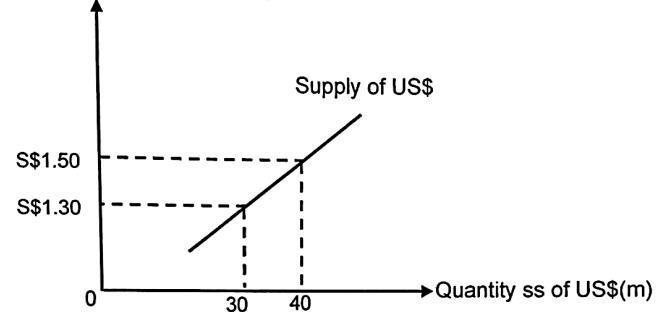


Figure 13: Supply of US dollar in the Forex market

#### → Supply of currency

##### 3 main sources of SS for US dollar

- US firms/consumers buying G&S produced by rest of the world
  - US firms/HH investing in other countries through FDI or foreign portfolio investment
  - Currency traders (speculators) expect US\$ to depreciate against foreign currencies in the future
- SS curve upward sloping;  $\uparrow P$  of US\$ in foreign currency,  $\uparrow QS$  as imports cheaper, US residents buy more X from SG +  $\uparrow I$  in SG (buy more SGD\$,  $\uparrow QS$  of USD to finance expenditure), ceter. par.
  - Free market equilibrium ER: QD for US\$ equals QS for US\$

## → Factors affecting exchange rate of a currency

**A Changes in demand for currency US\$** – shift DD curve for currency

### → A Changes in DD for US G&S by foreigners

- Economic expansion in SG: ↑ Y of SG, ↑ DD by SG consumers & firms for US domestic goods, ↑ DD for US\$ (↑ USD required to pay for ↑ volume of M from US), DD curve shifts right, US\$ appreciate against SGD, ceteris paribus
- Recession in SG: ↓ HH income, ↓ DD for US goods, ↓ DD for USD, DD curve shifts left, depreciation of USD against S\$

### → B Changes in relative interest rate between countries

- ↑ US i/r > other countries' i/r: ↑ relative returns from investing in US financial assets (bonds, savings in US banks), ↑ DD for USD, DD curve shift right, USD appreciates against other currencies
- ↓ US i/r < other countries' i/r: ↓ relative returns from investing in US financial assets, ↓ DD for USD, DD curve shift left, USD depreciates against other currencies, ceteris paribus.

### → C Changes in expectations of currency traders/speculators about future value of currencies

- Expectations of currency traders affected by expected future performance of US economy, political stability, interest rates, fiscal policy, other macroeconomic measures implemented by the government
- Convinced that USD appreciate in future: speculators sell SGD, buy USD, ↑ DD for USD, DD curve shift right, USD appreciates

**B Changes in supply of a currency US\$** – shift SS curve for currency

### → A Changes in DD for foreign produced G&S by Singaporeans

- Δ taste & preferences: US prefer imported SG G&S, ↑ DD for M, ↑ SS of US\$, SS shift right, US\$ depreciate against SGD

### → B Changes in relative interest rates between countries

- ↓ US i/r relative to SG i/r: ↑ desirable for US to invest in SG's financial assets, ↑ outflow of money from US to SG (short-term capital outflow), ↑ SS of USD, SS right, USD depreciates against SGD

### → C Changes in expectations of currency traders/speculators about future value of currencies

- Speculators expect USD to depreciate against SGD, sell holdings of US\$, buy SGD, ↑ SS of USD, SS shift right, USD depreciate against SGD

## → Adjustments to a new equilibrium

- ↑ DD for USD, DD shift right → shortage at original price level  $E_0$ , QD of USD exceeds QS, ↑ P to new equilibrium  $P$   $E_1$  to eliminate shortage, price of USD appreciate against SGD

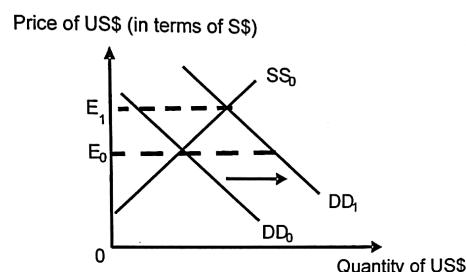


Figure 14: Demand for and Supply of US\$ in the Forex Market

## SECTIONAL SUMMARY

- **Exchange rate** is the value of one country's currency in terms of another currency
- The market exchange rate is determined by the interaction of demand for and supply of a country's currency

**2. Fixed exchange rate system** – Central Bank intervenes in forex market to control ER at fixed rate using foreign reserves to influence DD and SS of its domestic currency

- ↑ DD for Chinese X, ↑ Yuan (free market, Yuan appreciates against USD), Chinese central bank fix ER at  $e_1$  by ↑ SS of Yuan in forex market by buying ↑ USD + sell ↑ Yuan, prevents appreciation → devalued exchange rate  $e_1$  maintained

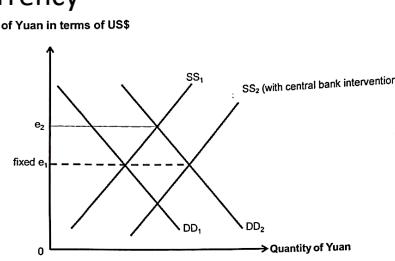


Figure 15: Fixed Exchange Rate

**3. Managed-float exchange rate system** – system of flexible exchange where Central Bank intervenes to prevent excessive fluctuations in its ER; used by many countries (less theoretical)

- Acceptable band (size varies among countries) where ER v fluctuate in FOREX before intervention
- External value of SGD determined by market DD and SS of SGD within specified limits/target band
  - Prevent depreciation below  $E_L$  – MAS intervene buy/DD SGD, sell USD, ↓ foreign reserves
  - Prevent appreciation above  $E_U$  – MAS sell/SS SGD in FOREX, buy USD, ↑ foreign reserves

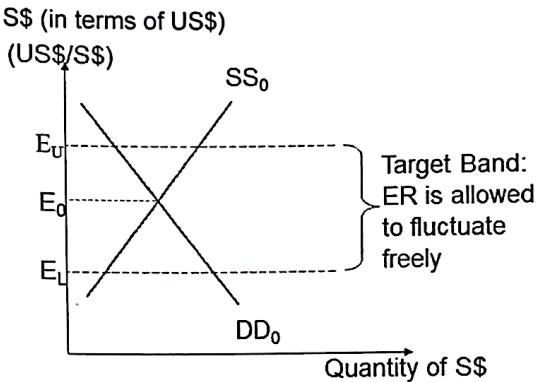


Figure 16: A Managed Float Exchange Rate System

#### SECTIONAL SUMMARY

- There is a spectrum of exchange rate systems ranging from free float to the fixed exchange rate system
- There is no government (central bank) intervention in the forex market when it comes to the free-floating exchange rate system, which is the case for the USD and Euro
- In a fixed exchange rate system, the government (central bank) intervenes in the FOREX market to control the exchange rate at a fixed rate by using its foreign reserves to influence the DD and SS of its currency

## 4.2 EXCHANGE RATE STABILITY – CONSEQUENCES

**Exchange rate stability** refers to avoidance of excessive fluctuations in exchange rates

- More unstable under freely float ER system than under fixed/managed float ER system

#### → A Reduction in uncertainty about ER → improvement in KFA + promote sustained economic growth

- Fix/peg domestic currency to foreign currency → foreign investor always knows his/her investment value, X worry about daily fluctuations in ER → stable atmosphere for foreign I
- ↑ inward FDI in domestic country, improve KFA + BOP
- ↑ inward FDI, ↑ new factories/building new plants, ↑ I → √ actual + potential growth

#### → B Fixed ER regimes lead to severe financial crises (why? difficult to maintain in LR)

- X maintain peg (ran out of foreign reserves) → speculation & panic: investors scramble to get money out of country + convert to foreign currency → currency depreciate + stock market decline
- Ex. Mexican 1995 (30% depreciation of peso), Asian 1997 (Thailand: must allow currency to float, lost 50% of value, FREX DD and SS readjusted value of local currency), Russian 1997 financial crisis

#### → C Foreign reserve accumulations entail opportunity costs

- Why? industrialised countries mandate that foreign reserves accumulated invested in highly liquid assets (short-term financial bonds & gov. securities – √ convert assets to cash easily)
- Problem – highly liquid assets yield relatively low rates of return vs alternative uses of funds → opportunity cost of maintain foreign reserve funds in highly liquid assets

#### → D Fixed ER regimes v inflationary if domestic country tries to maintain ER below free market ER

- Maintain external value of Yuan below free market ER, Chinese Central Bank sell yuan + buy foreign currencies in FOREX → inject liquidity/ ↑ SS in Chinese economy → if Chinese economy operating close to full employment, ↑ liquidity aggravate inflationary pressures → undesirable

#### SECTIONAL SUMMARY

- Exchange rates tend to be more unstable under freely float exchange rates system than fixed or managed float ER system
- Stability in ER can lead to an improvement in balance of payment on the capital/financial account and promote actual and potential economic growth
- Fixed ER regimes can often lead to severe financial crises because a peg is difficult to maintain in the long run, as well as being inflationary if the domestic country tries to maintain an ER below the free-market ER

**4.3 BALANCE OF TRADE BOT (trade balance)** – refers to value of difference between export revenue and import expenditure over a given period of time; part of CA, typically largest component of BOP

- **BOP** – record of country's international transactions involving flow of money between residents of a country and the rest of the world

- **Favourable BOT position** – refers to avoidance of a large and persistent BOT deficit or surplus

→ **Case studies** – Russia (free-floating ER system, no RAA), SG (managed float ER system)

Table 1: A Summary of Russia's BOP for 2020 (in million US\$).

<b>A Current Account Balance</b>	<b>36,004</b>
Goods Balance	93,735
Services Balance	-17,045
Primary Income Balance	-35,005
Secondary Income Balance	-5,680
<b>B Capital and Financial Account Balance</b>	<b>39,743</b>
Capital Account	519
Direct Investment	-3,632
Portfolio Investment	25,296
Financial Derivatives	1,950
Other Investment	29,378
Reserve Assets	-13,768
<b>C Net Errors and Omissions</b>	<b>3,739</b>
<b>D Overall Balance (A-B+C)</b>	<b>0</b>
<b>E Reserve Assets Account</b>	<b>0</b>

Adapted from Central Bank of the Russian Federation

Table 2: A Summary of Singapore's BOP for 2020 (in million S\$).

<b>A Current Account Balance</b>	<b>82,488.8</b>
Goods Balance	129,203.1
Services Balance	20,524
Primary Income Balance	-57,339.3
Secondary Income Balance	-9,899
<b>B Capital and Financial Account Balance</b>	<b>-19,851.9</b>
Direct Investment	-75,981.9
Portfolio Investment	71,028.3
Financial Derivatives	19,094.6
Other Investment	-33,992.5
<b>C Net Errors and Omissions</b>	<b>975.80</b>
<b>D Overall Balance (A-B+C)</b>	<b>103,316.5</b>
<b>E Reserve Asset Account</b>	<b>103,316.5</b>

Adapted from Singapore Department of Statistics

→ **Causes of Balance of Trade Deficit and Surplus** – factors heavily affect trade-dependent country SG

### A Changes in global conditions

#### I. Cyclical changes in global demand

- US recession: loss of Y & consumer confidence, ↓ US residents ability to buy SG X, ↓ DD for SG X  
→ assume US DD for SG X  $YED > 0$ , ↑ YED, greater ↓ in DD for SG X → SG BOT worsen, ceter. par.
  - Initially operating with BOT surplus, ↓ BOT surplus in CA | if M expenditure rise above X revenue, SG BOT surplus in CA turn into deficit, ceter. par.
- Economic boom in trading partners: ↑ DD for exports, BOT surpluses

#### II. Sustained economic growth in importing country

- ↑ ability & willingness to purchase imported G&S, BOT + CA worsen, ceter. par.
- Extent which M expenditure ↑ due to ↑ RNY depends on marginal propensity to import
  - MPM high, level of M vary closely with  $\Delta Y$ , ↑ Y (due to eg), larger effect on CA deficit
  - UK population: high MPM, CA deficit more sensitive to growth rates than other countries

**B Changes in international competitiveness** (structural changes due to shifts in comparative advantage,  $\Delta$  taste and preference,  $\Delta$  relative inflation rate → affect country's international competitiveness)

#### I. Changes in comparative advantage

- SG lost comparative advantage in low-medium end manufacturing to Asian developing countries (Vietnam, China – abundant labour, manufacture at lower opportunity cost) → ↓ X revenue in BOT
- SG new areas of ↑ in higher value industries (biomedical, financial services) → ↑ foreign/global DD for X of related G&S, ↑ export revenue, overcome ↓ X revenue → sustain + ↑ BOT surplus

#### II. Changes in taste and preferences

- Country slow to adapt to  $\Delta$  taste & preference, DD of X competed away by other countries → X revenue falls below M expenditure → BOT in CA deficit, ceter. par. → persist if country X able reallocate resources to adapt to structural changes

#### III. Changes in relative inflation rates between countries

- Domestic inflation ↑ relative to foreign inflation: ↓ P competitiveness of domestic X, ↓ foreign DD for relatively more expensive X, ↓ X revenue + ↑ DD by domestic HH of relatively cheaper M, ↑ M expenditure → ↓ BOT in CA of BOP with relatively higher inflation rates, ceter. par.

#### C Changes in exchange rates

- Overvalued currency/appreciation of domestic currency against foreign currency
  - ↑ units of foreign currencies to purchase one UK pound, ↑ P of X, ↓ foreigners' ability & willingness to buy UK G&S (extent of ↓ depends on PED), ↓ X competitiveness

- M relatively cheaper in domestic currency, ↓ UK pounds needed to buy same amount of foreign currency, ↑ UK's ability to buy foreign G&S, ↑ M/ ↓ M depends on PED for M
- Result – ↓ BOT surplus OR ↑ BOT deficit
- **Marshall-Lerner's condition:**  $|PED_x \text{ and } PED_m| > 1$  (even if individual PED coefficient < 1), appreciation worsen value of net-exports ( $X - M$ ) → worsen UK's BOT | depreciation improve BOT

#### D Government Policies

- Trade policies: direct impacts on trade balance; protectionism (shelter domestic industries from foreign competition via trade barriers on M) ↑ BOT of domestic country, ↓ BOT of X country
- Other gov policies: indirect impact on BOT; industrial policies (help countries industrialize), involve importation of technological & capital goods → BOT worsen, cet. par.

#### E Random factors/shocks – unanticipated/unpredictable factors (war, natural disasters)

- Destroy infrastructure of economy, ↓ X due to cessation of production activities, halt SS of X + ↑ M of capital goods and consumption goods to rebuild economy → worsen BOT, cet. par.

#### Causes of Capital and Financial Account net inflow (surplus)/outflow (deficit)

- **KFA** – records of long-term fixed capital movements and short-term capital flows
  - Inflow and outflow of FDI is a key determinant of KFA position
  - Developed & sophisticated financial sectors (SG) – ST financial flows large (k) of KFA
- LT fixed capital flows – expected rate of return, international competitiveness, global DD conditions
- ST financial capital flows – Δ relative i/r, expected ER, exchange control regulations

#### A Δ expected rate of return (LT) – FDI level depends on expected rate of return (foreign investors)

- Expected rate of return takes into account COP, amount of gov subsidies, tax policies of country
  - ↓ COP, ↑ subsidies, ↓ corporate tax rates → ↑ expected returns, ↑ inflow of FDIs
- ↓ Expected rate of return on investment projects in domestic countries > others: ↓ profitability from investments locally, ↓ inflow of FDIs + local businesses invest directly abroad, ↑ FDI outflows → KFA account worsen, cet. par.
- ↓ domestic i/r relative to others: short-term net capital (hot money) outflows, speculators globally withdraw money from banks + deposit in other countries to reap ↑ returns to deposits → ↓ KFA

#### B Changes in relative inflation rates between countries (LT)

- ↑ inflation rate relatively higher than other investment destination: ↑ COP + uncertainty of πs (due to unstable prices) → prediction of returns to investments difficult → discourage FDI inflows + encourage FDI outflow to countries w lower & more stable inflation rates → ↓ KFA, cet. par.
  - Initially operating with KFA surplus, ↓ KFA surplus/turn deficit | KFA deficit, ↑ KFA deficit

#### C Changes in global demand conditions (LT)

- FDI inflows for countries with rising consumer demand: ↑ consumer DD/trend of ↑ economic growth associated with ↑ affluence & ↑ population → boosts confidence of foreign investors to invest & set up production facilities (expect πs) → ↑ KFA
- FDI inflows for countries with large export base (SG): despite small SG population, large export base attracts foreign investors → why? ✓ export products to large foreign consumer base from SG

#### D Changes in relative interest rates (ST)

- ↓ domestic i/r relative to other countries: short-term net capital (hot money) outflows, speculators globally withdraw money from country's banks + deposit in other countries → greater returns to deposits → worsen KFA (KFA deficit = net outflow)

#### E Changes in expected exchange rates (ST)

- Destabilising speculation + capital flight occurs when depreciation of domestic currency expected
- Expect domestic currency to depreciate, sell domestic currency to purchase foreign currencies, net outflow of funds from domestic economy → domestic KFA worsen, cet. par.

#### F Exchange control regulations (ST) – restricts amount of currency flowing overseas

- Exchange controls removed, large outflow of currency (why? investors diversity + take advantage of investment opportunities overseas) → ↓ KFA

## → Consequences of a balance of trade deficit

### A Implications on Economic Growth and Standard of Living

- BOT deficit – country pay more for imports of G&S than exports of G&S
- BOT deficit,  $\downarrow AD (X - M < 0)$ ,  $\downarrow RNY \rightarrow \downarrow$  actual growth + job creation,  $\downarrow SOL$ 
  - Ex. US runs largest bilateral trade deficit with China, launch trade war against China  $\rightarrow$  cut trade deficit to create jobs in US + strengthen economy
- BOT influences currency exchange rates through effect on SS and DD for foreign exchange
  - Country  $M > X$ , relatively  $\downarrow DD$  for currency,  $\downarrow P$ , currency depreciates/loses value, weaker currency,  $\uparrow$  import P,  $\downarrow SOL$  (pay more for M G&S,  $\downarrow PP$ )

### B Implications on Equity

- BOT deficit financed by running KFA surplus (net inflow in KFA) + running down on foreign reserves
- Rely + borrow to finance large & persistent CA deficit: external debt (principal + i/r to foreigners)  
 $\rightarrow$  future generations burdened with high debt levels + large i/r payments  $\rightarrow$  falls on HH in next generation for  $\uparrow$  current C  $\rightarrow$  implicate economic growth + SOL + intergenerational inequity

### C Opportunity costs – repayments of external debt to finance BOT deficits have opp. cost

- Why? interest owed to foreigners better used in supporting developmental policies (investment in health + education to boost human capital of population) + alternative use of foreign reserves

## → Consequences of a balance of trade surplus – impact depends on size of BOT surplus + reasons for surplus

### A Implications on economic growth and standard of living

- BOT surplus – country receive more for exports of G&S than it is paying for imports
- BOT surplus,  $\uparrow AD (X - M > 0)$ ,  $\uparrow RNY \rightarrow$  actual growth + job creation
- Relatively higher DD for currency: appreciate, M G&S cheaper,  $\uparrow PP$  for residents,  $\uparrow SOL$
- Limitation – if large BOT surplus due to relatively weaker domestic DD,  $\downarrow$  consumer spending +  $\downarrow$  spending on imports  $\rightarrow$  domestic employment suffer from weak economy

### B Accumulation of foreign reserves

- If BOT surplus lead to overall BOP surplus  $\rightarrow$  accumulation of foreign reserves
- If country adopts managed float/fixed ER system, relatively  $\uparrow DD$  for currency, pressure for currency to appreciate  $\rightarrow$  prevent appreciation by selling currency in exchange for foreign currency in FOREX  $\rightarrow$  accumulation of foreign reserves

### C Possible retaliation by trade partners – large BOT surplus can be controversial political issue

- Why? other countries feel surplus is due to undervalued ER, trade balance improves at expense of trading partners' trade balance  $\rightarrow$  deficit countries forced to reduce imports to  $\downarrow$  deficit
  - Ex. excess BOT surplus (Germany, China),  $\downarrow$  output & jobs in countries with BOT deficit
  - Ex. US BOT deficit (large M of cheap China products), US pressure China to let Yuan appreciates + impose tariffs on products (Chinese steel & tire) + trade war (US\$500 billion tariff on Chinese goods)

## → Types of exchange rate systems and their effects on BOP positions

- Consequences of BOP that arise from trade disequilibrium vary according to ER regime

### 1. Freely float exchange rate system – BOP always in free-market equilibrium

- BOP surplus/deficit automatically eliminated via adjustment by ER mechanism
- Inflow of funds in BOP = DD for currency in forex market
  - Foreigners buy USD to purchase US exports + conduct FDIs in US
- Outflow of funds in BOP = SS of currency in forex market
  - US residents exchange USD for foreign currencies to purchase imports, ↑ SS of USD

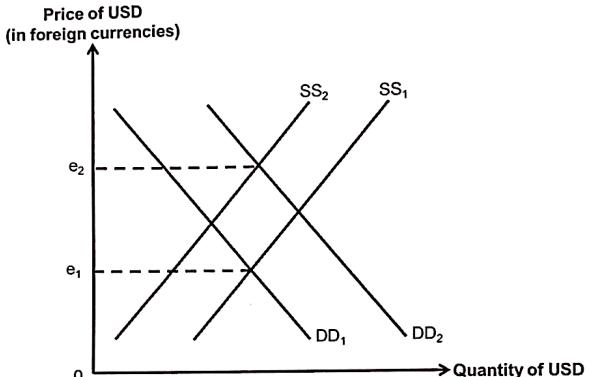


Figure 17: Demand for and Supply of US Dollar (USD) in the Forex Market

- Free market equilibrium QD always equal to QS of domestic currency → inflows = outflows on BOP

### Process of ER adjustments

- ↑ US i/r relative to foreign countries: foreigners deposit money in US in search for relatively higher returns on savings, short-term capital flow into US, ↑ DD for USD (deposits saved in USD) AND US citizens ↓ flow of short-term investments overseas, keep deposits in US, ↓ SS of USD (↓ USD exchanged for foreign currencies deposited overseas) → ↑ DD + ↓ SS, shortage of USD, BOP surplus (due to financial account surplus, net inflow in BOP)
- BOP surplus is only temporary: shortage in forex, upward pressure on US ER, USD appreciate against foreign currencies, ↑ P of X US in foreign currency, M cheaper for US citizens → assume Marshall-Lerner conditions  $|PED_x + PED_M| > 1$ , BOT worsen → adjustment occurs until new equilibrium ER reached at  $e_2$  & CA deficit cancels out financial account surplus
- Result: forex market for USD & BOP in equilibrium (BOP surplus corrected by appreciation of ER; BOP deficit corrected by depreciation of ER)

### Positive and negative effects of appreciation of ER on economy (esp if appreciation is significant)

- Dutch Disease Effect (negative effect of appreciation of ER) – BOP surplus, appreciation of currency, G&S more expensive for foreign buyers, ↓ competitiveness, difficult to compete in world market
  - Ex. decline of Netherland's manufacturing sector: booming X of natural gas, ↑ X revenues, turn BOP deficits into surplus, appreciation of currency ....
- Countries reliant on natural resources to drive growth: difficulty in inclusive & sustainable growth
  - Why? ↑ exploitation of natural resources (oil, diamond, copper) + ↓ manufacturing sector (de-industrialisation) → ↑ UnE (manufacturing sector more labour intensive than natural resource industries – capital intensive)
  - ↑ returns and costly & time-consuming learning in manufacturing → economy struggle to rebuild sources of growth upon depletion of natural resources
- Depreciation of ER: positive (↑ export competitiveness); negative (↑ imported inflation)

### 2. Fixed exchange rate system – Central Bank uses foreign reserves to influence DD & SS of currency → movements in official reserves account

- ↑ DD for Chinese X: improve trade balance, BOP surplus AND ↑ DD for Yuan, shortage at original ER, upward pressure on Yuan → Chinese central bank sell Yuan + buy more foreign currency to prevent appreciation of Yuan → accumulation of foreign reserves [RAA = CA – KFA + overall BOP]
- BOP disequilibrium X corrected; BOP remain in persistent surplus/deficit if ER fixed below/above free market equilibrium rate

### 3. Managed float exchange rate system

- BOP disequilibrium results in appreciation/depreciation of currency within allowable ER band or target band → ER adjustments in FOREX market correct BOP disequilibrium

- X within acceptable band: Central Bank intervene to maintain ER, persistence of BOP deficit/surplus → movements in official foreign reserves to accommodate BOP disequilibrium

#### 4.4 BOP DEFICIT AND EXCHANGE RATE

**Freely floating ER system** – BOP deficit temporary; automatically eliminated by depreciation of ER

**Fixed/managed-float ER system** – ER fixed above market equilibrium ER, BOP deficit persists

- Central Bank sells foreign currencies, buy domestic currency to prevent depreciation
  - Result 1: Run down official foreign reserves to accommodate BOP deficit → ↓ ability to ward off potential speculative attacks on domestic currency in future
  - **OR** Result 2: Foreign reserves run out, Central Bank relax control of currency, depreciate, ↓ consumer ability to import G&S + producers ability to import raw materials
- If foreign reserves run out OR X deplete reserves, ✓ borrow foreign currencies from international financial institutions (IMF/other countries) → creates external debt that needs to be repaid

#### 4.5 BOP SURPLUS AND EXCHANGE RATE

**Freely floating ER system** – BOP surplus temporary; automatically eliminated by appreciation of ER

**Fixed/managed-float ER system** – ER fixed below market equilibrium ER, BOP surplus persists

- Central Bank buys foreign currencies, sells domestic currency to prevent appreciation, accumulates official foreign reserves, accommodate BOP surplus

##### I. Accumulation of foreign reserves due to undervaluation of exchange rate

- Build-up of official foreign reserves, ↑ ability to ward off potential speculative attacks on domestic currency in future, ↑ confidence in economy
- Limitation – undervaluation of ER represents forgone opportunity for citizens to consume ↑ imports & ↑ SOL → why? undervalued ER, M relatively more expensive to domestic consumers, ↓ quantity of imports consumed & enjoyed by domestic consumers, ↓ SOL

##### II. Retaliation (protectionism)

- BOP surplus maintained with undervalued currency, country accused of being currency manipulator practicing unfair trade (refer to section on consequences of BOT surplus) → BOT deficit countries impose M controls, ↓ M to country, ↓ trade deficit → detrimental to world trade
- Refer to Globalisation and the International economy on the consequences of protectionist policies

#### SECTIONAL SUMMARY

- The main factors affecting the Balance of Trade include changes in global demand conditions, changes in international competitiveness/relative inflation, and changes in exchange rates
- BOT surpluses/deficits can have implications on countries' economic growth and living standards, balances on the official foreign reserves and on its relationship with its trading partners
- Disequilibrium in the BOP is automatically corrected in a freely floating exchange rate system. However, the BOP disequilibrium persists in a fixed (and possibly a managed float) exchange rate system
- Under a fixed/managed-float exchange rate system, a persistent BOP deficit could result in the depletion of official reserves, as well as creation of external debt if official reserves were to run out
- A persistent BOP surplus results in an accumulation of the foreign currencies in the official reserves. Countries having persistent BOP surpluses may be accused of being currency manipulators and attract retaliation measures by other countries.