

H2 Economics (Microeconomics)

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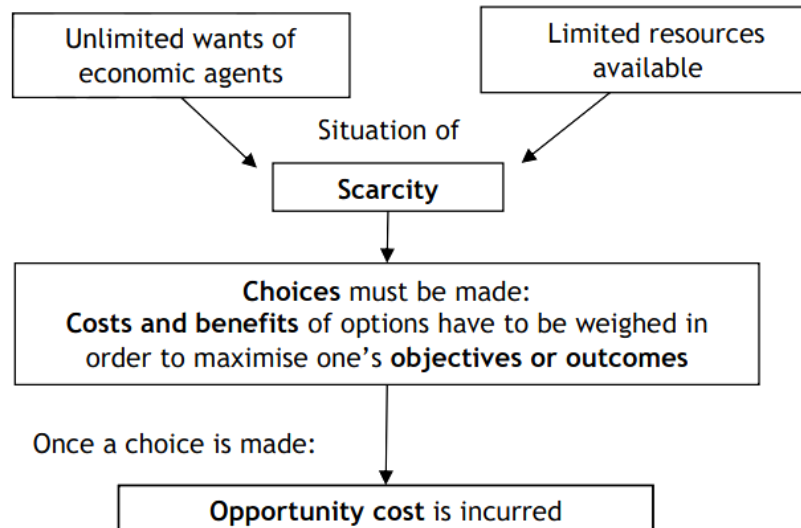
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Theme 1: Central Economic Problem

1.1 Scarcity as the Central Economic Problem

Scarcity, choice, resource allocation



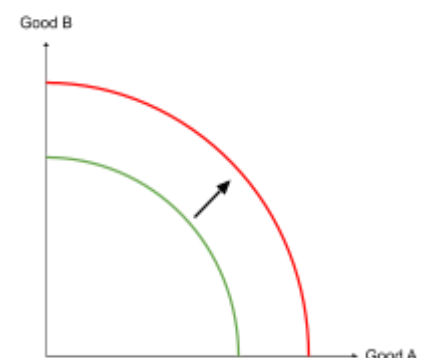
1. **Central Economic Problem** is **scarcity** → due to **unlimited wants** + **limited resources**

Factor	Description	Returns
land	natural resources	income
labour	human resource available to work	salary
capital	man-made aid to production	return
entrepreneur	organise other three FOPs + take risk of production	profits

2. Limited resources are insufficient to satisfy unlimited wants
→ **economic problems** of what & how & for whom to produce
3. Scarcity implies that **choices** have to be made in the allocation of scarce resources b/w different uses
→ via price mechanism in free market
4. Incur **opportunity cost**: value of next-best alternative forgone

Production Possibility Curve (PPC):

combinations of max amt of two goods produced in a certain period, with fixed level of technology + all available resources fully and efficiently employed

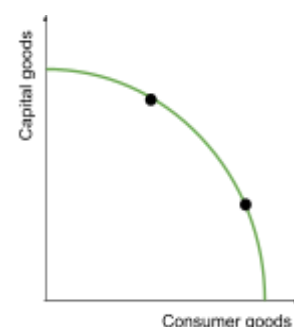


Microeconomic		
Scarcity	<u>on/inside PPC</u> Attainable points	<u>beyond PPC</u> Unattainable points (desired due to unlimited wants + unattainable due to limited resources, i.e. scarcity)
Choice	<u>choose</u> among alternative combinations Which attainable combination (what + how much) to produce	
Opportunity cost	<u>negative slope</u> Produce more of one good → sacrifice some of other good	<u>concave to origin</u> Increasing opportunity cost as FOP is <u>not equally suited</u> for producing different goods
Productive efficiency (max possible production output)	<u>on PPC</u> Productive efficiency	<u>inside PPC</u> Productive inefficiency <ul style="list-style-type: none">• Underemployment: inefficient use of resources• Unemployment: failure to use all resources
Allocative efficiency	<u>ONE point on PPC</u> maximise social welfare (consumer + producer) → achieve <u>no wastage of resources</u>	
Macroeconomic		
Full employment and unemployment	<u>on PPC</u> full employment of resources → produce max possible output	<u>inside PPC</u> unemployment of resources → X produce max possible output
Actual economic growth (increase in national output)	<u>inside PPC → on PPC</u> produce more of both goods (fuller use of resources)	
Potential economic growth (increase in productive capacity – potential output)	<u>outward shift</u> productive capacity ↑ <ul style="list-style-type: none">• quantity & quality of FOP ↑• improvement in technology	<u>inward shift</u> productive capacity ↓ <ul style="list-style-type: none">• quantity & quality of FOP ↓

Investment-consumption choice

- **Capital goods**: used to produce other goods
e.g. factories, machinery, tools, equipment

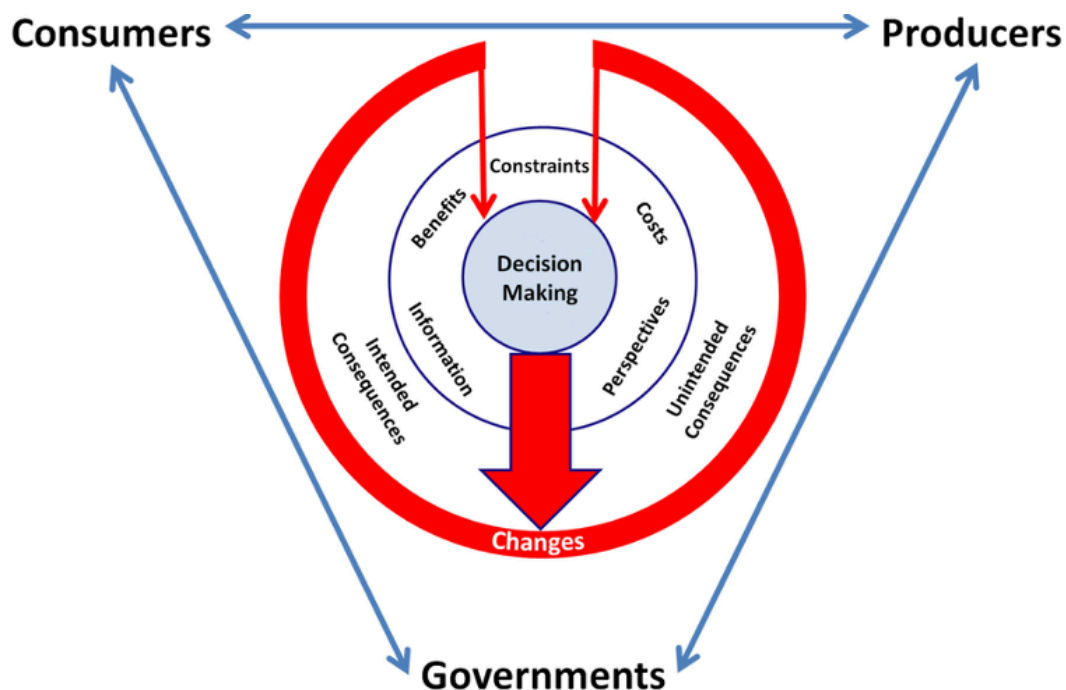
Consumer goods: for final consumption
e.g. hawker food, clothing



- Consequence of investment VS consumption

	produce <u>capital goods</u> via investment	produce <u>consumer goods</u> for consumption
current	less consumer goods for consumption → satisfy less needs and wants → <u>lower SOL</u>	more consumer goods for consumption → satisfy more needs and wants → <u>higher SOL</u>
future	more investment → greater productive capacity (more capital goods used to produce other goods) → higher rate of potential economic growth → greater outward shift of PPC → <u>higher SOL</u>	less investment → smaller productive capacity (less capital goods used to produce other goods) → lower rate of potential economic growth → smaller outward shift of PPC → <u>lower SOL</u>

Decision-making process



Decision making framework:

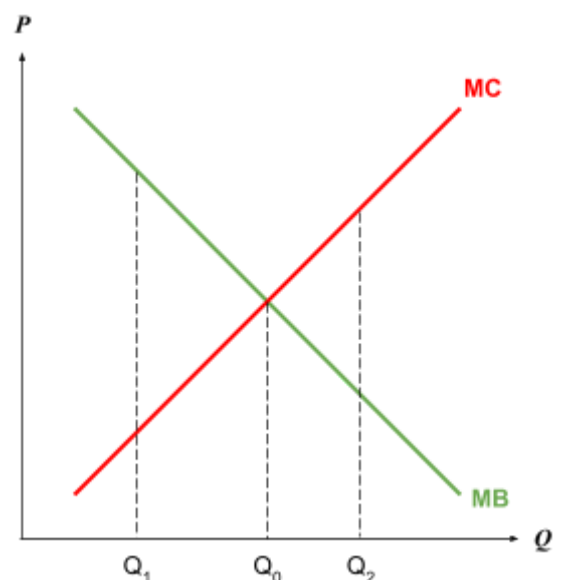
- Cognitive biases OR Rationality assumption, goal oriented
- Information – imperfect, distorted
- Perspectives
- Constraints**
- Weigh benefits and costs → marginalist principle*****
- Intended and unintended consequences*

Economic agents:

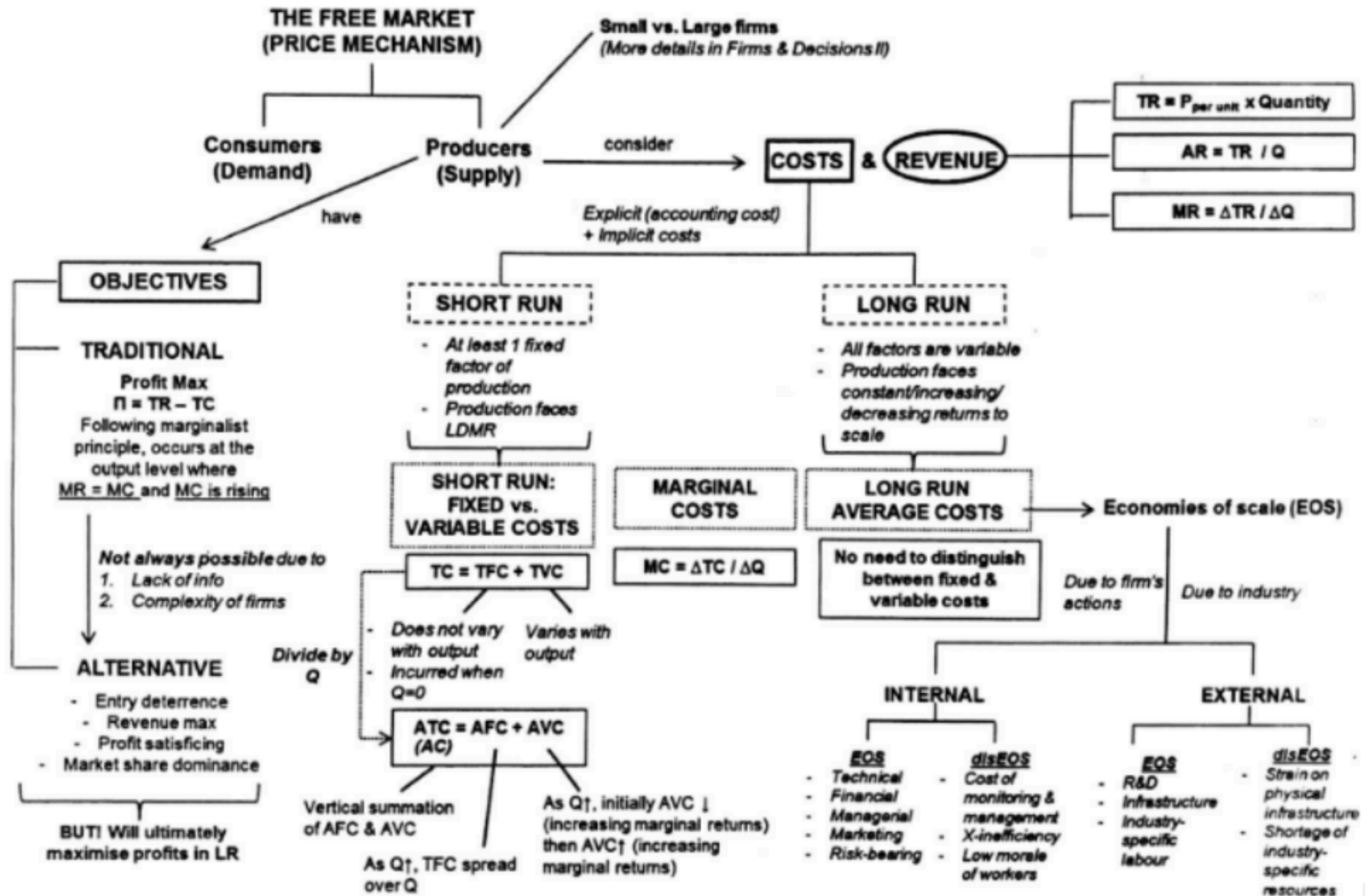
	Consumers	Producers	Governments
Self-interest	Maximise <u>utility</u> from buying G&S MU = MC	Maximise <u>profits</u> from producing then selling G&S MR = MC	Maximise <u>social welfare</u> when making policy decisions MSB = MSC
	Total utility – total spending	Total revenue – total cost	Total social benefits – total social cost
Constraints	limited income	afford to pay for limited amount of resources	limited budget
Decision making	what to buy	what to produce what resources to hire	how to allocate spending

Marginalist principle: make decisions on consumption/production of an additional unit of G&S based on additional benefit derived from it, to maximise total net benefit

- Weigh MB & MC
 - MB: satisfaction gained from consuming one additional unit of good
 - MC: monetary cost of good = price
- At Q_1 , $MB > MC$: consuming one more unit adds more to total benefit than total cost, increasing net total benefit → increase consumption
- At Q_2 , $MC > MB$: consuming one less unit reduces total cost more than total benefit, increasing net total benefit → decrease consumption
- Consume up to Q_0 where $MB = MC$ → optimal level of activity, as next additional unit results in loss in net total benefit



Theme 2: Markets



2.1 Price Mechanism

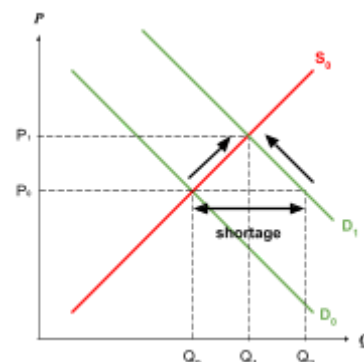
Price mechanism

Price mechanism: determine price of G&S through interaction of DD & SS

→ means of allocating resources in a market economy

Functions

1. Signalling	<p>What and how much to produce?</p> <ul style="list-style-type: none"> • Csr exercise dollar votes: signal their <u>preference</u> for G&S thru the <u>price</u> that they are willing and able to pay (i.e. effective demand) • Preferences transmitted to prs in the form of price received from csr, have information about consumers' DD • Prs respond by producing G&S that csr demand to max profits → G&S that they are willing and able to supply (i.e. supply)
2. Incentive	<p>How to produce?</p> <ul style="list-style-type: none"> • Producers incentivised to allocate more resources to increase production of <u>G&S that fetch higher price</u> to max profits
3. Rationing	<p>For whom to produce?</p> <ul style="list-style-type: none"> • DD for G&S increase → shortage → <u>drive up price</u> → <u>discourage demand</u> → contraction of demand along DD curve to create new equilibrium → G&S rationed out to csr who are willing and able to pay for it (highest dollar vote)

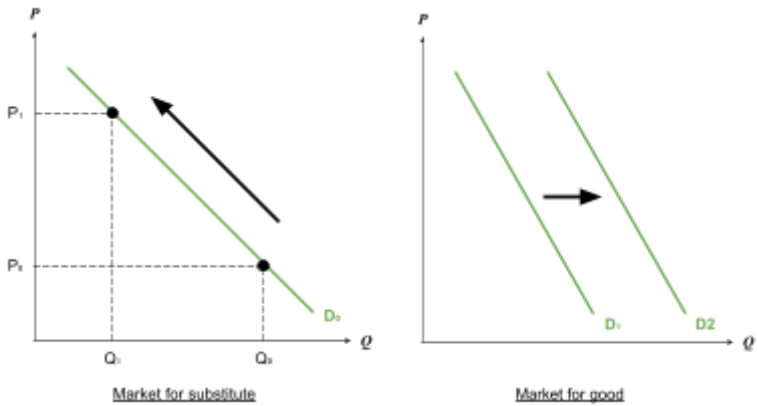
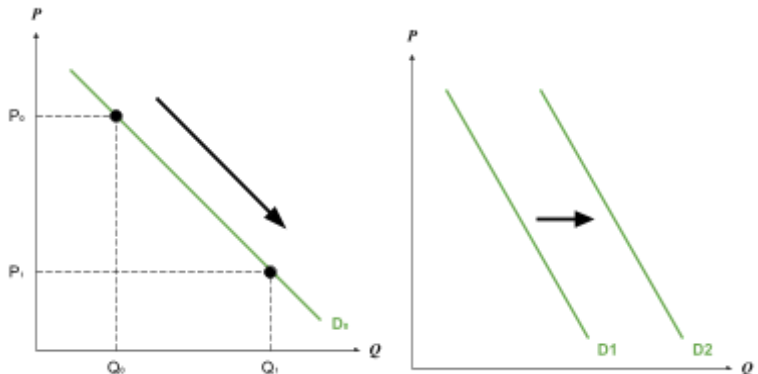


Demand and supply

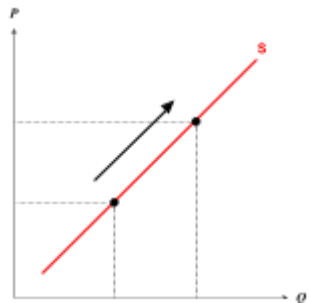
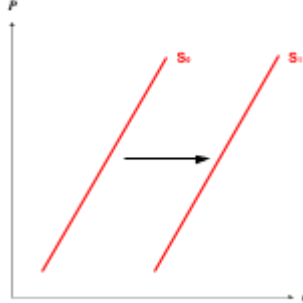
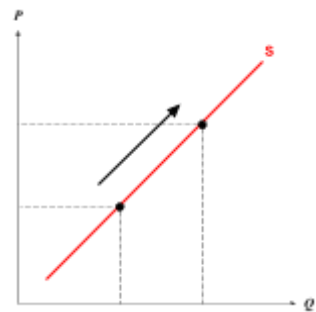
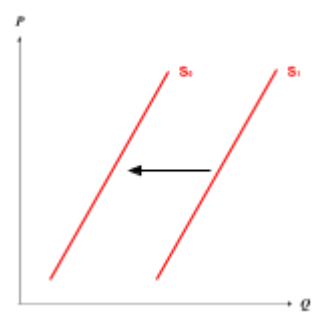
Demand	Supply
Quantity of G&S that consumers are <u>willing and able</u> to purchase at <u>each possible price</u> over a given period of time, <u>ceteris paribus</u>	Quantity of G&S that producers are <u>willing and able</u> to offer at <u>each possible price</u> over a given period of time, <u>ceteris paribus</u>
<p>Determinants of demand</p> <ul style="list-style-type: none"> • Price: <u>movement</u> along DD curve • Non-price (EGYPT-O): <u>shift</u> of DD curve 	<p>Determinants of supply</p> <ul style="list-style-type: none"> • Price: <u>movement</u> along SS curve • Non-price (GERMS-O): <u>shift</u> of SS curve

Determinants of DD

1. Price	<p>Law of demand: Qdd <u>inversely related</u> to P</p> <ul style="list-style-type: none"> <u>Law of diminishing marginal utility:</u> as csr consume more units of good (Qdd ↑), marginal utility derived from consumption of each additional unit ↓ → csr willing to pay increasingly less for each additional unit consumed → P ↓ <u>Income effect:</u> P ↓ → with fixed income, csr' purchasing power ↑ → more w/a to buy more units of good → Qdd ↑ <u>Substitution effect:</u> P ↓ → good is relatively cheaper than its substitutes → with fixed income, utility-maximising consumers more w/a to <i>switch</i> towards consuming good → Qdd ↑ 	
2. Expectation of future prices	<p>Expect future price to increase: Utility-maximising consumers, with fixed income, want to avoid paying higher price to consume same good before price increase sets in ⇒ current DD ↑</p>	<p>Expect future price to decrease: Utility-maximising consumers purchase good later when price is lower ⇒ current DD ↓</p>
3. Govt policy	<p><u>Subsidy:</u> on merit goods e.g. education/healthcare</p> <ul style="list-style-type: none"> Good becomes more affordable → consumers' purchasing power increases ⇒ DD ↑ <p><u>Interest rate:</u> on big-ticket items e.g. house/car that involve instalments</p> <ul style="list-style-type: none"> Low i/r → lower cost of taking loans (interests repaid) → csr more w/a to take loans to finance purchase of big-ticket items ⇒ DD ↑ <p><u>Exchange rate:</u></p> <ul style="list-style-type: none"> Currency appreciate → local goods become more expensive as compared to foreign goods → locals switch from local goods to imports, less w/a to purchase local goods ⇒ DD for local goods ↓ Currency depreciate → local goods become cheaper as compared to foreign goods → locals switch from imports to local goods, more w/a to purchase local goods ⇒ DD for local goods ↑ 	
4. Income level	<p>Normal good: Y ↑ purchasing power ↑ → more w/a to purchase goods at each price level ⇒ DD ↑ [apply YED if necessary]</p>	<p>Inferior good: Y ↓ purchasing power ↓ → switch towards consuming goods which they derive lower utility ⇒ DD ↑</p>
5. Price of related goods	<p>Competitive demand:</p> <ul style="list-style-type: none"> Substitutes: a pair of goods where csr derive <u>similar utility</u> Price of substitute increase → with fixed income, csr switch away from substitute towards good 	<p>Joint demand:</p> <ul style="list-style-type: none"> Complements: a pair of goods <u>consumed jointly</u> Price of complement decrease → with fixed income, csr more w/a to purchase complement

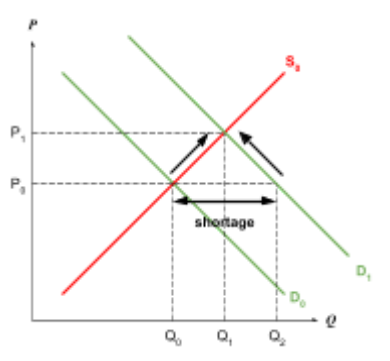
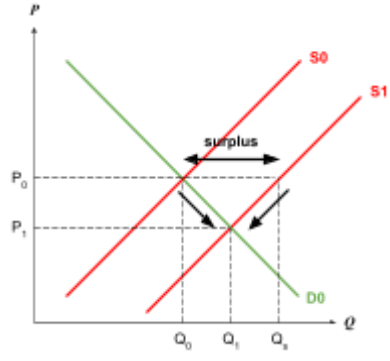
	<p>• \Rightarrow Qdd of substitute \downarrow <u>DD for good \uparrow</u></p> 	<p>• \Rightarrow Qdd for complement \uparrow <u>DD for good \uparrow</u></p> 
	<p>Derived demand: DD for good increase \Rightarrow <u>DD for FOP \uparrow</u></p>	
6. Taste and preferences	<p>Advertising campaign: increase desirability of good + build brand loyalty \Rightarrow <u>DD \uparrow</u></p>	

Determinants of SS

1. Price	<p>Law of supply states that Q_{ss} is <u>directly related</u> to P, ceteris paribus</p> <ul style="list-style-type: none"> <u>Law of diminishing marginal returns</u>: units of output \uparrow MC of production \uparrow (FOP are imperfect substitutes of each other) \rightarrow prs only w/a to accept higher price to supply additional unit of good, to cover higher MC incurred <u>Profit-maximising</u>: price of good $\uparrow \rightarrow$ profits from supplying additional units of goods $\uparrow \rightarrow$ prs more w/a to increase Q_{ss} 	
2. Govt policy	<p>Indirect tax: MC increase relative to MR \rightarrow profit-maximising prs w/a to supply same qty of goods only at higher price to cover higher MC incurred \Rightarrow SS \downarrow</p>	<p>Indirect subsidy: MC decrease relative to MR \rightarrow profit-maximising prs incentivised to increase Q_{ss} at each price to capture marginal profit \Rightarrow SS \uparrow</p>
3. Expectation of future prices	<p>Expect future price to increase: Prs temporarily hold back quantity of goods released into the market at each price level, build up stocks \rightarrow sell goods at higher price in the future to capture profits \Rightarrow current SS \downarrow</p>	<p>Expect future price to decrease: Prs release larger quantity of goods into the market at each price level, in order to max current profits, as selling goods at lower price in the future leads to lower profits \Rightarrow current SS \uparrow</p>
4. Price of related goods	<p>Joint supply: two goods produced together (by-products) e.g. crocodile meat & leather</p> <ul style="list-style-type: none"> Increased production of one good \rightarrow increased production of other good P of cow hide \uparrow = profit-maximising prs \uparrow Q_{ss} of cow hide (to cover higher MC incurred at higher o/p) = slaughter more cows = beef comes from cows \Rightarrow SS of beef \uparrow <div style="display: flex; justify-content: space-around;">   </div>	<p>Competitive supply: two goods share <u>same FOP</u> e.g. wooden chair & table</p> <ul style="list-style-type: none"> Increase production of one good \rightarrow divert FOP away \rightarrow decrease production of other good \Rightarrow SS \downarrow <div style="display: flex; justify-content: space-around;">   </div>

5. Marginal cost of production	Price of FOP ↓ (e.g. SS of FOP ↑) → MC decrease relative to MR → profit-maximising producers incentivised to increase SS to capture marginal profit ⇒ SS ↑	Technology e.g. automation → increase productivity, less input required to produce same level of output → MC decrease relative to MR → profit-maximising prs incentivised to increase SS to capture marginal profit ⇒ SS ↑
6. Number of sellers	More producers w/a to enter market at every price level ⇒ SS ↑	
7. Natural factors	Climatic conditions <ul style="list-style-type: none"> • Abundant rainfall, absence of pests → farmers able to increase agricultural production ⇒ SS↑ 	Natural phenomena <ul style="list-style-type: none"> • Droughts, floods, earthquakes → farmers less w/a to supply crops to market ⇒ SS↓ (supply shock)

Market adjustment process:


<p style="text-align: center;">Shortage</p> <ul style="list-style-type: none"> At original price P_0, $Q_{dd} > Q_{ss} \rightarrow$ shortage of Q_2Q_1 Buyers compete for the good, bid up price, <u>price increase</u> With fixed income, csr purchasing power decrease $\rightarrow Q_{dd} \downarrow$ Units of o/p that can only be produced at higher MC become profitable - prs incentivised to $\uparrow Q_{ss}$ to capture marginal profits Upward pressure on price until shortage is eliminated 	
<p style="text-align: center;">Surplus</p> <ul style="list-style-type: none"> At original price P_0, $Q_{ss} > Q_{dd} \rightarrow$ surplus of Q_2Q_1 Producers cut prices to clear excess stock to reduce losses, <u>price decrease</u> With fixed income, csr purchasing power increase $\rightarrow Q_{dd} \uparrow$ Units of o/p that can only be produced at higher MC become unprofitable, prs incentivised $\downarrow Q_{ss}$ to avoid marginal losses Downward pressure on price until surplus is eliminated 	

Simultaneous changes in demand and supply:

1. P/Q indeterminate as the two changes in mkt forces have an opposing effect on P/Q
2. Explain why $|\Delta DD| > |\Delta SS|$ or $|\Delta DD| < |\Delta SS|$

Elasticity concepts

(DIRECTION + MAGNITUDE)

	-1	0	1	
				
 PED 				
PES				
YED		inferior		
XED	close complement	weak complement	weak substitute	strong substitute
			inelastic	elastic
			inelastic	elastic
			necessity	luxury

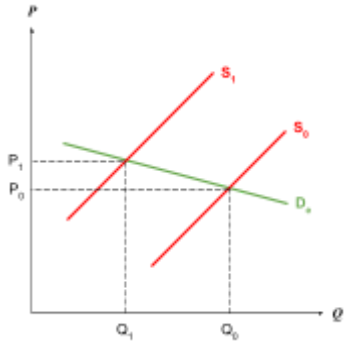
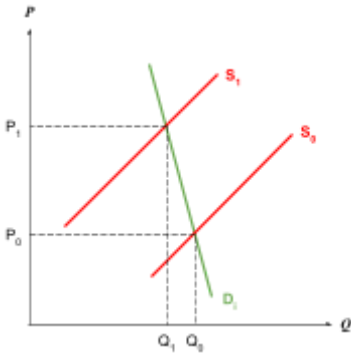
WHEN TO APPLY?

- Explain sharp increase/decrease in price/quantity
 - PED inelastic \rightarrow price need to increase by large extent *induce* sufficiently large decrease in Q_{dd} to clear shortage
 - PES inelastic \rightarrow price need to increase by large extent to *induce* sufficiently large increase in Q_{ss} clear shortage
- Deduce change in TE/TR

1. Price Elasticity of Demand (PED)

Responsiveness of quantity demanded of good to change in its own price, ceteris paribus
[when there is **CHANGE IN SS**]

$$\text{PED} = \% \Delta Q_{dd} / \% \Delta P$$

$ \text{PED} > 1$	$ \text{PED} < 1$
elastic $P \uparrow Q_{dd} \downarrow \text{MTP}$	inelastic $P \uparrow Q_{dd} \downarrow \text{LTP}$
	

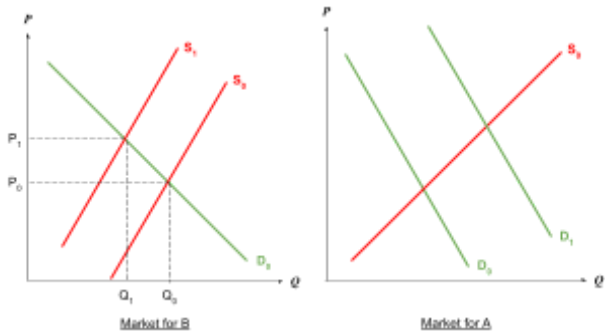
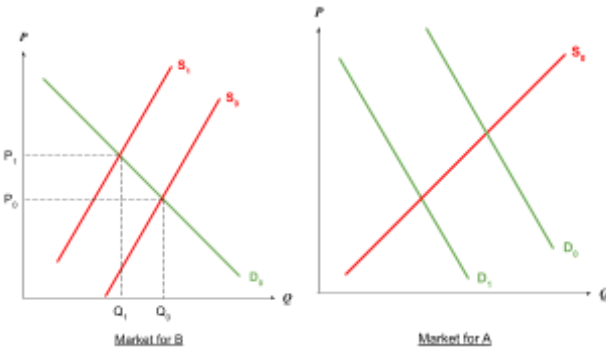
Determinants

Substitutes	<u>Quantity + closeness</u> of substitutes $\uparrow \rightarrow$ when $P \uparrow$ csr readily switch to substitutes $\rightarrow Q_{dd} \downarrow \text{MTP} \Rightarrow$ <u>PED more elastic</u>
Time period	In LR, csr have time to adjust consumption patterns, seek other substitutes when $P \uparrow \rightarrow Q_{dd} \downarrow \text{MTP} \Rightarrow$ <u>PED more elastic</u>
Income proportion	Income proportion spent on good $\uparrow \rightarrow$ purchasing power decrease more significantly when $P \uparrow \rightarrow Q_{dd}$ decrease MTP \Rightarrow <u>PED more elastic</u>
Necessity	Degree of necessity $\uparrow \rightarrow$ when $P \uparrow$ difficult to reduce consumption / do away $\rightarrow Q_{dd}$ decrease LTP \Rightarrow <u>PED more inelastic</u>

2. Cross Elasticity of Demand (XED)

Responsiveness of demand for a good to change in price of another good, ceteris paribus (relationship b/w two goods)¹

$$\text{XED} = \% \Delta Q_{dd_A} / \% \Delta P_B$$

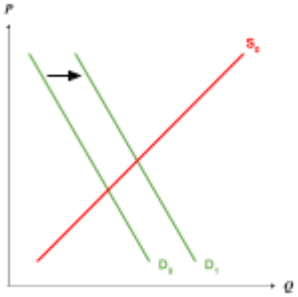
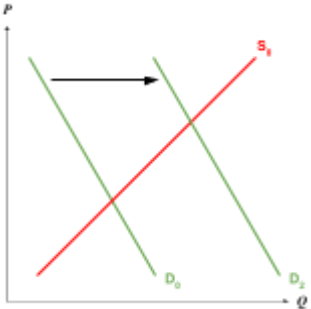
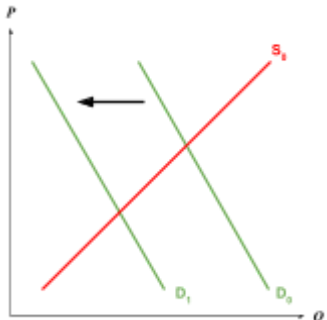
XED > 0		XED < 0	
<u>Substitutes</u> $P_B \uparrow DD_A \uparrow$ (same direction)		<u>Complements</u> $P_B \uparrow DD_A \downarrow$ (opposite direction)	
			
magnitude > 1	magnitude < 1	magnitude > 1	magnitude < 1
<u>Strong substitute</u> $P_B \uparrow DD_A \uparrow \text{MTP}$	<u>Weak substitute</u> $P_B \uparrow DD_A \uparrow \text{LTP}$	<u>Strong complement</u> $P_B \uparrow DD_A \downarrow \text{MTP}$	<u>Weak complement</u> $P_B \uparrow DD_A \downarrow \text{LTP}$

¹ movement along DD curve for one good causes shift in DD for another good

3. **Income Elasticity of Demand (YED)**

Responsiveness of demand for good to change in income, ceteris paribus

$$\text{YED} = \% \Delta Q_{dd} / \% \Delta Y$$

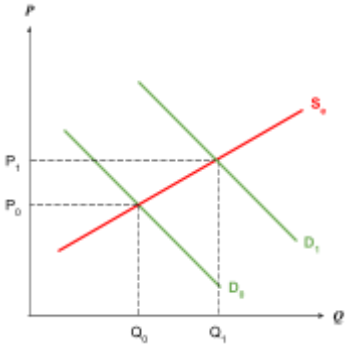
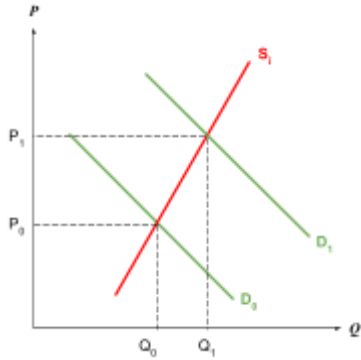
YED > 0		YED < 0
<u>normal good</u> Y ↑ DD ↑ (same direction)		<u>inferior good</u> Y ↑ DD ↓ (opposite direction)
YED > 1	YED < 1	
<u>luxury</u> Y ↑ DD ↑ to larger extent (high dependence on income level)	<u>necessity</u> Y ↑ DD ↑ to smaller extent (little dependence on income level)	
		

Necessity	Income change induce LTP change in Qdd <i>at given price</i> ⇒ income inelastic <ul style="list-style-type: none"> Y ↓ cannot be given up easily as essential for survival, DD ↓ to small extent Y ↑ additional purchasing power not directed towards necessity, DD ↑ to small extent
Luxury	Income change induce MTP change in Qdd <i>at given price</i> ⇒ income elastic <ul style="list-style-type: none"> Y ↓ luxury goods are the first to be given up ⇒ DD ↓ by large extent Y ↑ additional purchasing power goes to create demand for luxury goods, after expenditure on necessities have been accounted for ⇒ DD ↑ by large extent
Inferior	<ul style="list-style-type: none"> Y ↑ greater purchasing power, consumers less w/a to purchase inferior goods as they are now able to switch to goods that yield higher level of utility ⇒ DD ↓

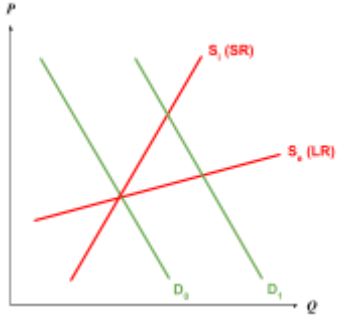
4. Price Elasticity of Supply (PES)

Responsiveness of quantity supplied of good to change in its own price, ceteris paribus
[when there is **CHANGE IN DD**]

$$\text{PES} = \% \Delta Q_{ss} / \% \Delta P$$

PES > 1	PES < 1
elastic P ↑ Qss ↑ MTP	inelastic P ↑ Qss ↑ LTP
	

Determinants

Mobility of FOP	<p>FOP able to switch b/w different locations or uses → when P ↑ prs more able to increase Qss ⇒ PES more elastic</p> <ul style="list-style-type: none"> • <u>Geographical mobility</u>: FOP move b/w diff locations • <u>Occupational mobility</u>: FOP move b/w diff industries <ul style="list-style-type: none"> ○ High-skilled jobs → need time to train workers
Time period	<p>In LR, when P ↑ prs have time to source for more FOP to step up production → Qss ↑ MTP ⇒ PES more elastic</p> 
Existence of spare capacity	<p>More <u>spare capacity</u> → when P ↑ prs able to increase Qss ⇒ PES more elastic</p>

Consumer expenditure (TE): total amount of money that consumers spend on G&S

Producer revenue (TR): total amount of money that producers receive from sale of G&S

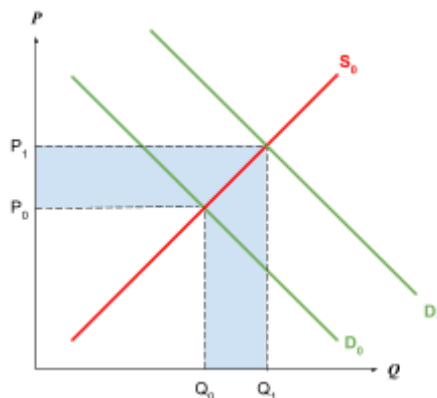
Without government intervention,

$$TE = TR = \text{price per unit (P)} * \text{no. of units (Q)}$$

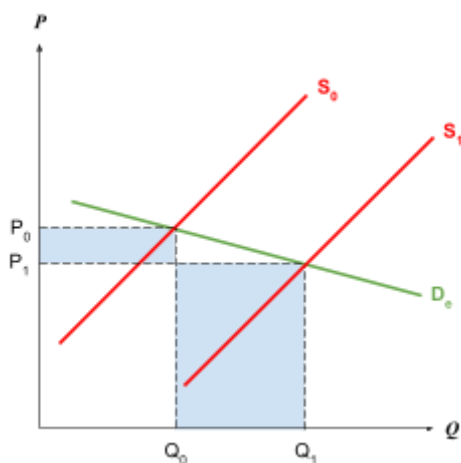
Given SS change, use PED to derive change in TE/TR

Given DD change, use PES to derive change in TE/TR

When DD \uparrow , P \uparrow Q $\uparrow \Rightarrow$ TE/TR \uparrow

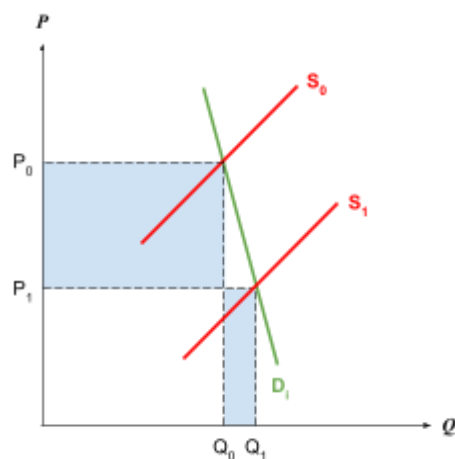


When SS \uparrow , P \downarrow Q $\uparrow \Rightarrow$ change in TE/TR depends on PED



PED elastic:

increase in TE/TR due to Q \uparrow outweighs decrease in TE/TR due to P \downarrow
 \Rightarrow TR \uparrow



PED inelastic:

decrease in TE/TR due to P \downarrow outweighs increase in TE/TR due to Q \uparrow
 \Rightarrow TR \downarrow

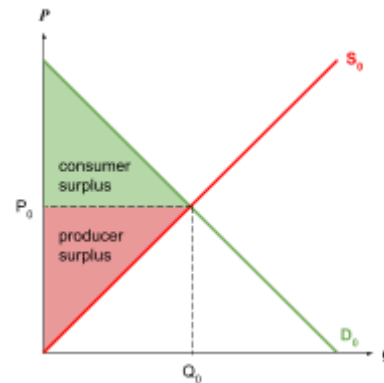
Microeconomic objectives and policies

Consumer surplus: difference b/w price that consumers are willing to pay & actually pay

Producer surplus: difference b/w price that producers are willing to receive & actually receive

Governments' microeconomic objectives: E&E

1. **Allocative efficiency:** efficient use of resources
2. **Equity:** equitable distribution of output



INDIRECT TAX

Levy imposed on sale of G&S, paid indirectly by producers

Objective:

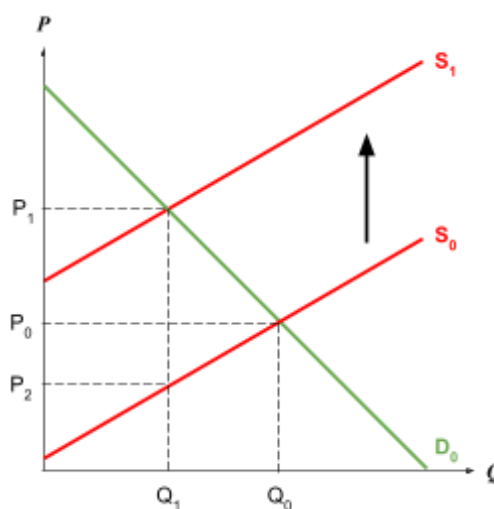
Discourage production or consumption of good
Raise tax revenue to finance govt spending

Examples:

- demerit goods e.g. tobacco, alcohol
- Goods and Services Tax (GST)

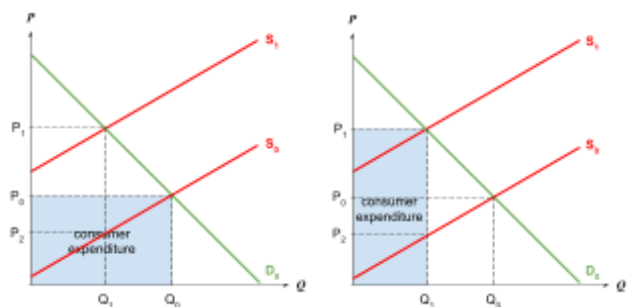
How it works:

MC increase relative to MR → producers ↓ SS to avoid marginal loss = equilibrium $P \uparrow Q \downarrow$



Consumer expenditure

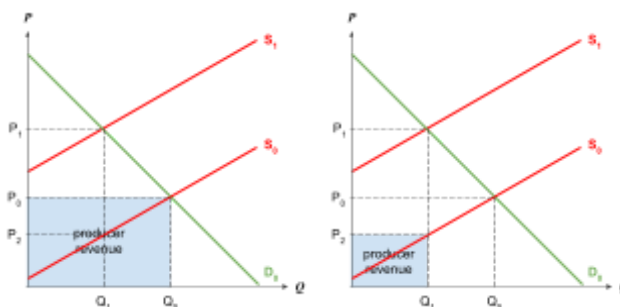
Price consumers pay per unit of output * units of output



- PED elastic: decrease
- PED inelastic: increase

Producer revenue

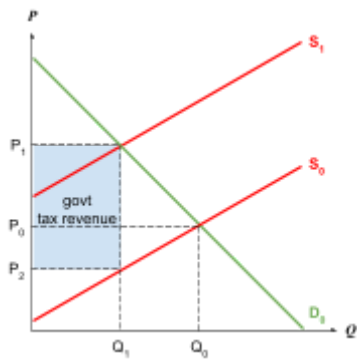
Price producers receive per unit of output * units of output



Decrease regardless of PED

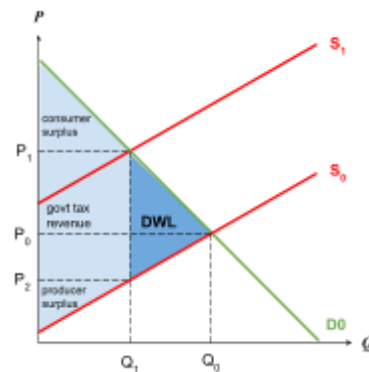
Govt tax revenue

Tax per unit of output * units of output



Microeconomic objectives

Allocative inefficiency



Csr surplus decrease, prs surplus decrease, govt tax revenue

⇒ DWL

Equity

- Regressive in nature: take larger % of income from low-income households than high-income households e.g. soda tax

Effectiveness

Discouraging consumption

- PED elastic: more significant decrease in Qty ⇒ effective
- PED inelastic: less significant decrease in Qty → require high tax rate to induce large increase in price for Qty to fall significantly ⇒ ineffective

Raising govt tax revenue

- PED elastic: less tax revenue generated ⇒ ineffective
- PED inelastic: more tax revenue generated ⇒ effective

Problems

Black market

- Csr find way to satisfy wants in face of high taxes → smugglers incentivised to import good from countries with no/lower tax → undercut legal sellers and gain profit ⇒ ineffective in discouraging consumption

INDIRECT SUBSIDY

Provision of financial assistance by govt to producers

Objective:

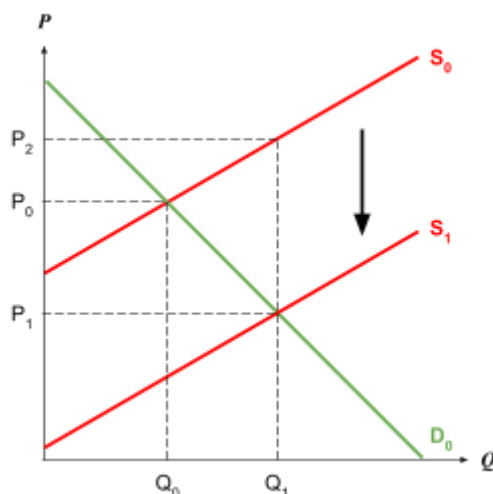
Encourage production or consumption of good
Make good more affordable for the poor

Examples:

- merit goods e.g. healthcare, education
- necessities e.g. petrol, cooking oil

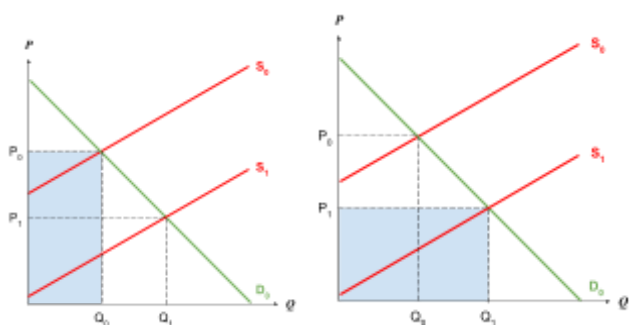
How it works:

MC decrease relative to MR \rightarrow producers \uparrow SS to capture marginal profit \Rightarrow eqm $P \downarrow Q \uparrow$



Consumer expenditure

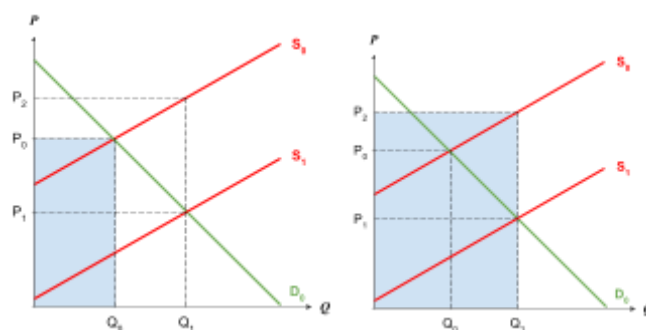
Price consumers pay per unit of output * units of output



- PED elastic: increase
- PED inelastic: decrease

Producer revenue

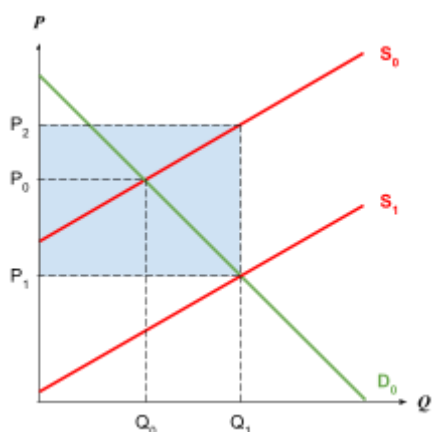
Price producers receive per unit of output * units of output



Increase regardless of PED

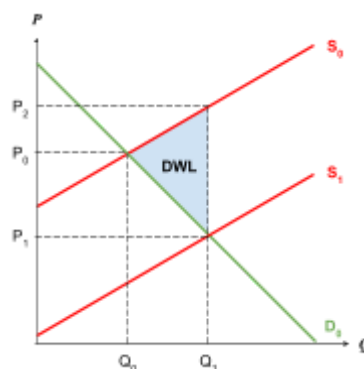
Govt subsidy spending

Subsidy per unit of output * units of output



Microeconomic objectives

Allocative inefficiency



Csr surplus increase, prs surplus increase, govt subsidy spending \Rightarrow DWL

	<p>Equity – depends on type of good</p> <ul style="list-style-type: none"> • Necessities: lower prices → low-income households have greater purchasing power, have access to necessities ⇒ <u>improve equity</u> • Luxury goods: greater increase in purchasing power of high-income than low-income households → benefit high-income households more ⇒ <u>worsen equity</u>
<p>Effectiveness</p> <p>Encouraging consumption</p> <ul style="list-style-type: none"> • PED elastic: small decrease in price sufficient to induce large enough increase in Qdd ⇒ <u>effective</u> • PED inelastic: large decrease in price needed to induce large enough increase in Qdd ⇒ <u>ineffective</u> <p>Lower price of good</p> <ul style="list-style-type: none"> • PED elastic: small decrease in price needed to induce small increase in Qdd ⇒ <u>ineffective</u> • PED inelastic: large decrease in price needed to induce large enough increase in Qdd ⇒ <u>effective</u> 	<p>Problems</p> <p>Black market</p> <ul style="list-style-type: none"> • Subsidy lowers price of good in the country below price of same good overseas • Smugglers incentivised to take risk to make profit by purchasing good at subsidised price at home & selling good at higher price in another country → undermine effectiveness of subsidies to keep necessities affordable and available to locals • Govt conduct checks and enforce rules → divert away scarce resources from alternative uses (opportunity cost) <p>Worsen govt budget position</p> <ul style="list-style-type: none"> • Spending on subsidy, without compensating spending cuts in other sectors <p>Opportunity cost of subsidy</p> <ul style="list-style-type: none"> • Divert funds away from other sectors

PRICE CEILING

Maximum legal price allowed by govt, no G&S can be bought or sold at price above this upper limit (set below eqm price in free market)

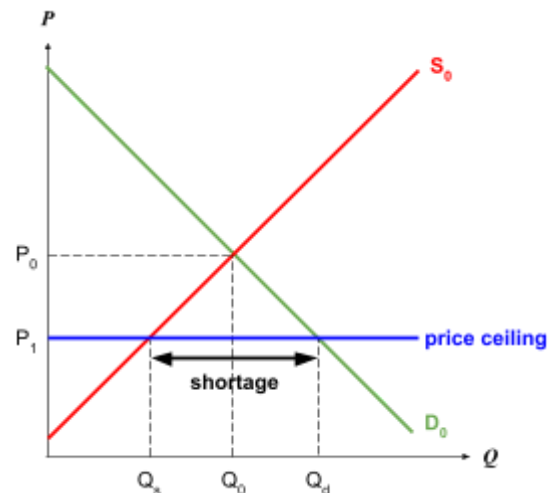
Objective:

Keep goods affordable to consumers e.g. necessities (food, housing, rent)

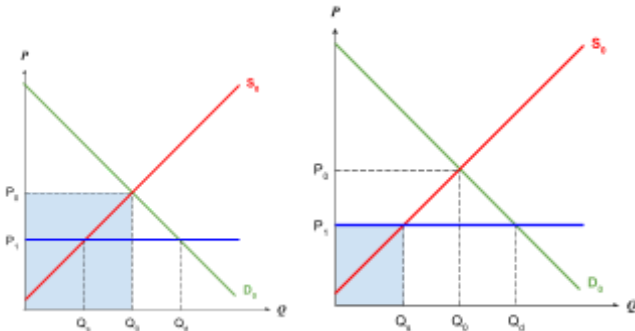
How it works:

Create *persistent shortage* ($Q_{dd} > Q_{ss}$) → size depends on PED & PES

- At lower price, consumers increase Q_{dd}
- At lower price, units of o/p that can only be produced at higher MC are no longer profitable → producers decrease Q_{ss}



Consumer expenditure = producer revenue

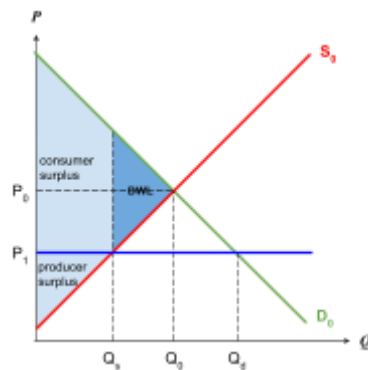


Effect on $TE = TR$ depends on PED & PES

- PED & PES elastic: larger decrease in TE/TR (larger fall in qty)

Microeconomic objectives

Allocative inefficiency



Csr surplus uncertain, prs surplus decrease
⇒ DWL

Equity

- Keep price of good low → more affordable to low-income households
- Counter regressive effect: increase in price of necessities represents larger percentage of incomes of low-income than high-income households → greater decrease in purchasing power
- Fewer units of good available in market → decrease availability of good → hurts other groups of csr

Problems**Black market**

- Csr prepared to pay higher price → sellers incentivised to illegally sell good at higher price → csr have to pay inflated prices well above ceiling price
- Govt conduct checks and enforce rules → take away scarce resources from alternative uses (opp cost)

Quality deterioration

- No ability to increase prices → prs cut cost of production to maintain profitability (switch to lower-grade materials, reduce portion size) → csr utility fall
- Govt issue specific product standards → incur high cost to enforce

Reduction in market supply in LR

- Higher profits in alternative industries which do not face price controls → raise opp cost of staying in existing industry → prs leave industry → market SS decrease → increase size of shortage → higher prices → lower-income households unable to afford G&S

PRICE FLOOR

Minimum legal price allowed by govt
(set above equilibrium price in free market)

Objective:

Protect producers from selling goods priced too low
→ prs receive fair income

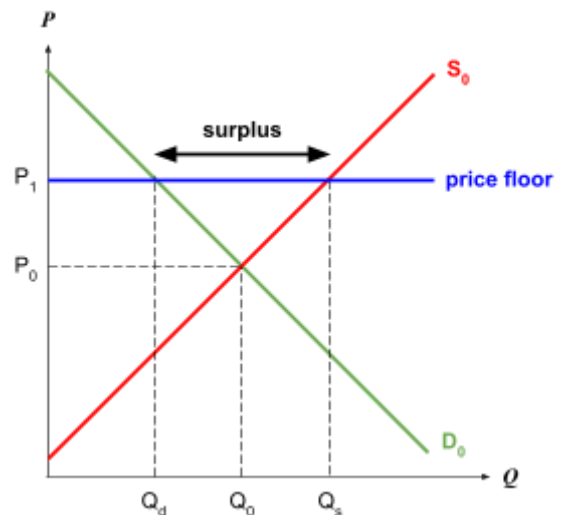
Examples:

- Agriculture
- Minimum wage

How it works:

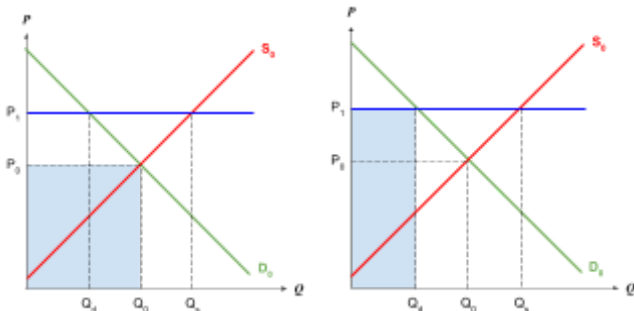
Create *persistent surplus* ($Q_{ss} > Q_{dd}$)

- At higher price, consumers decrease Q_{dd}
- At higher price, units of o/p that can only be produced at higher MC are now profitable → producers increase Q_{ss}



Consumer expenditure

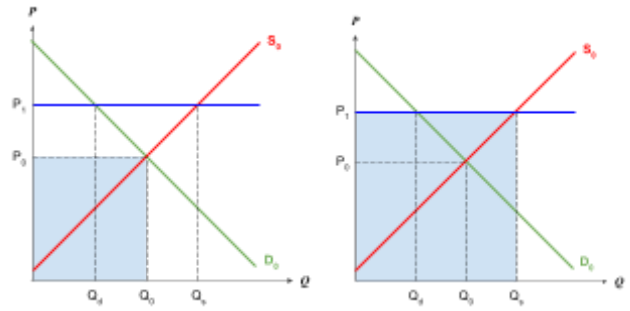
Price consumers pay per unit of output * units of output (Q_d)



- PED elastic: decrease
- PED inelastic: increase

Producer revenue (govt buy up surplus)

Price producers receive per unit of output * units of output (Q_s)



Increase regardless of PED

Govt's response to surplus

Buy up surplus

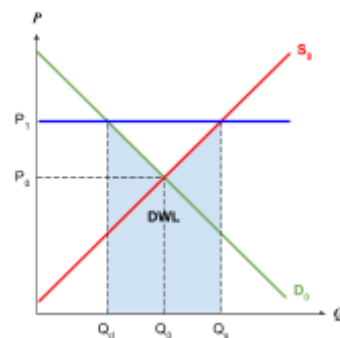
- Worsen govt budget position
- Opportunity cost: at the expense of other sectors
- Raise taxes to finance spending

Raise demand

- Advertising, find alternative uses for good, reduce consumption of substitutes

Microeconomic objectives

Allocative inefficiency



Csr surplus decrease, prs surplus increase, govt spending
⇒ DWL

Equity

Minimum wage

- Raise workers' income, narrow income gap
- Job loss → workers originally employed are now retrenched

Agriculture

- Raise farmers' income
- Higher food price → decrease purchasing power (+ regressive effect) of low-income households, unaffordable

QUOTA

Limit on quantity of goods that can be sold
(set below eqm qty exchanged in free market)

Objective:

Limit consumption of demerit goods (e.g. alcohol, tobacco)

Limit production processes that give rise to negative externalities (e.g. greenhouse gas emissions)

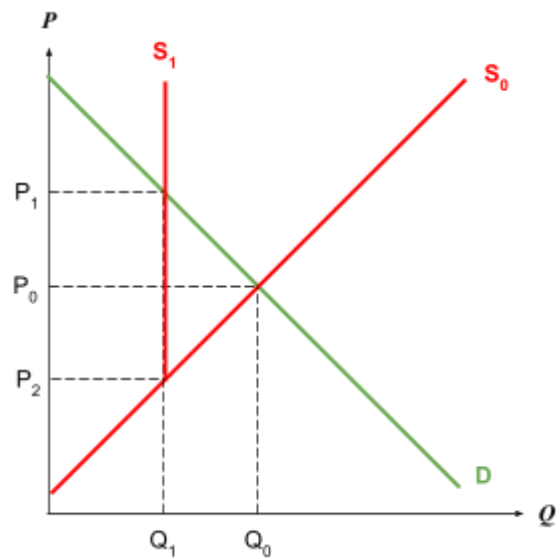
Raise producers' income (PED inelastic goods)

Protect domestic producers from foreign competition, by limiting qty of foreign goods that enter market (e.g. import quota on steel)

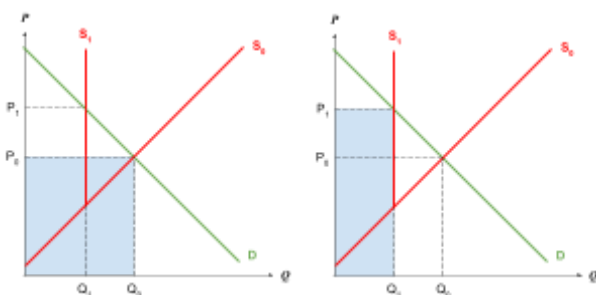
How it works:

Section of SS curve beyond quota qty becomes perfectly price inelastic \rightarrow eqm $Q \downarrow P \uparrow$

Increase in price depends on PED



Consumer expenditure = producer revenue



- PED elastic: decrease
- PED inelastic: increase

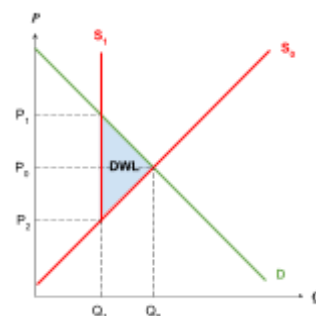
Problems

Black market

- Beyond quota amount and up to original eqm output, there exists quantities of output for which consumers are w/a to pay prices above what it costs to supply good to mkt
- Opportunity for profit \rightarrow entice producers to cheat and produce in excess of quota
- Conduct checks to enforce \rightarrow divert away scarce resources (opportunity cost)

Microeconomic objectives

Allocative inefficiency



Csr surplus decrease, prs surplus uncertain
 \Rightarrow DWL

Equity

- Regressive effect if goods are necessities: low-income households spend larger % of income \rightarrow greater decrease in purchasing power \Rightarrow worsen equity
- Raise producers' income (PED inelastic goods), where producers are disadvantaged group e.g. poor farmers \Rightarrow improve equity

2.2 Firms and Decisions

Cost, revenue, profits

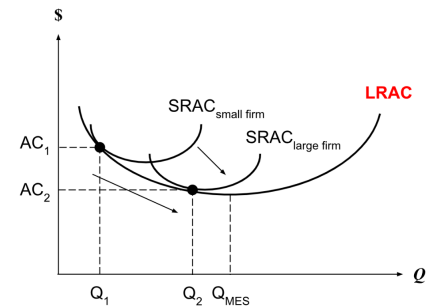
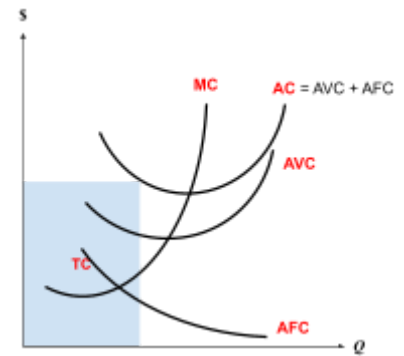
Short run: at least one factor input is fixed

- **Total cost (TC)** = TFC + TVC
- **Total fixed cost (TFC)**: independent of o/p level (unavoidable)
e.g. rent, R&D, marketing cost
- **Total variable cost (TVC)**: changes with o/p level (avoidable)
e.g. wages
- **Average cost (AC)** = AFC + AVC
- **Explicit cost**: cost of using factor inputs
- **Implicit cost**: opportunity cost of using factor inputs

Long run: all factor inputs are variable

Firm is able to vary all factor inputs → expand scale of production

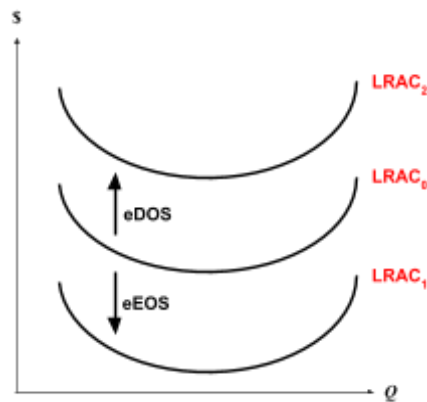
- Internal: expansion of firm
- External: expansion of industry (firm itself does not expand)



Internal economies of scale (iEOS)	Internal diseconomies of scale (iDOS)
<ul style="list-style-type: none"> • Cost savings arising from benefits of increasing o/p by expanding firm's scale of production • Increase in o/p leads to <u>LTP</u> increase in total cost → AC decrease as o/p increase • Movement along downward sloping portion of LRAC 	<ul style="list-style-type: none"> • Rising average cost from increasing o/p by expanding firm's scale of production • Increase in o/p leads to <u>MTP</u> increase in total cost → AC increase as o/p increase • Movement along upward sloping portion of LRAC
<p>Indivisibilities of factor inputs***</p> <ul style="list-style-type: none"> • Machinery that can greatly enhance productivity are too large and expensive for small firms to use • Large firms with higher o/p can spread out costs → <u>lower unit COP</u> → lower pricing to capture larger market share <p>Specialisation of inputs</p> <ul style="list-style-type: none"> • Division of labour → assign workers to specific roles → daily repetition allows workers to accumulate more skills and knowledge → raise productivity → <u>lower unit CoP</u> <p>Marketing economies</p> <ul style="list-style-type: none"> • Bulk purchase of inputs at favourable (discount) rates • Advertising → spread cost over larger o/p → <u>lower unit COP</u> 	<p>Managerial diseconomies</p> <ul style="list-style-type: none"> • Communication problem: bogged down by rules, regulations, standard procedures → slow down decision making, decrease efficiency • Coordination problem: difficult to coordinate between various departments → more supervision required → <u>higher AC</u> <p>Financial diseconomies</p> <ul style="list-style-type: none"> • Need more funds for operations • Firms borrow too heavily, become debt-ridden → undermine credit-worthiness → banks demand higher interests rates on loans to compensate for higher risk → <u>higher AC</u> <p>Marketing diseconomies</p> <ul style="list-style-type: none"> • Many layers of hierarchy → decision makers in large firms are distanced from customer base • Additional marketing expenditure needed to bridge information gaps → <u>higher AC</u>

Financial economies

- Large firm has more assets to offer as collateral → more credit-worthy → banks more willing to offer lower interest rates when taking on loans



External economies of scale (eEOS)	External diseconomies of scale (eDOS)
<ul style="list-style-type: none"> Falling unit costs of production when whole industry expands Downward shift of LRAC 	<ul style="list-style-type: none"> Rising unit costs of production when whole industry expands Upward shift of LRAC
Economies of concentration Sharing of resources b/w firms in industry <ul style="list-style-type: none"> Training: training centres set up to meet industry's growing demand for labour, providing ready pool of skilled workers Infrastructure: shared by firms, lowering operating costs Economies of information <ul style="list-style-type: none"> Firms share cost of R&D → obtain information more cheaply as compared to carrying out R&D independently Economies of disintegration <ul style="list-style-type: none"> Division of production processes among firms → specialisation 	Higher input prices <ul style="list-style-type: none"> Industry expand → Increased demand for FOP + PES inelastic → firms bid higher prices Strain on infrastructure <ul style="list-style-type: none"> Concentration of firms in one region → pollution, congestion, overcrowding

Firms' objectives

1. Profit maximisation

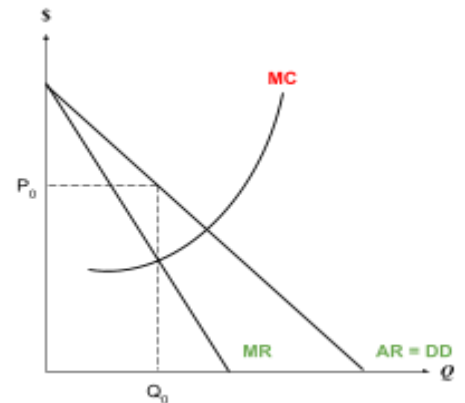
Profit-maximising output: **MR = MC** and **MC is rising**

1) Quantity:

If o/p less than Q_0 , $MR > MC$, firm increase o/p to capture marginal profit, to Q_0 where $MR = MC$

If o/p greater than Q_0 , $MC > MR$, firm decrease o/p to avoid marginal loss, to Q_0 where $MR = MC$

At o/p Q_0 , $MR = MC$, any possible positive marginal profit has been exhausted



2) Price:

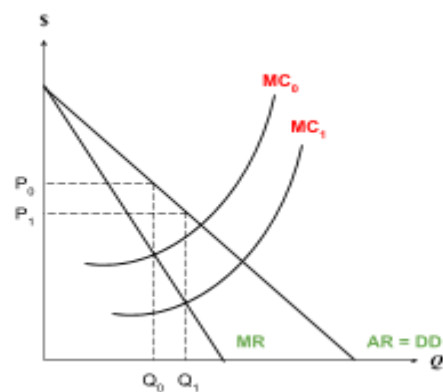
Firm charges highest possible price P_0 given the demand

2. Profit satisficing

1) Revenue maximisation	<ul style="list-style-type: none"> • MR = 0 • <u>Principal-agent problem</u> (separation of ownership and control): owner want to max profits \Leftrightarrow managers paid commission as % of sales revenue \rightarrow aim to max revenue to max self-interests
2) Growth maximisation	<ul style="list-style-type: none"> • AR = AC (max possible o/p that avoids incurring losses) • Gain <u>mkt share</u>, higher LR profit
3) X-inefficiency	<ul style="list-style-type: none"> • Use <u>more input than necessary</u> at certain o/p level \rightarrow AC, MC higher than necessary • Occur due to: <ul style="list-style-type: none"> ◦ Lack of competitive pressures ◦ Imperfect knowledge of the lowest costs or wages needed ◦ Trade unions' demands for higher wages
4) Imperfect info on MC	<ul style="list-style-type: none"> • Usually only consider <u>explicit costs</u> since easier to compute, but <u>economic cost</u> (explicit + implicit costs) is difficult to calculate \rightarrow true MC unknown
Imperfect info on MR	<ul style="list-style-type: none"> 5) <u>Not ceteris paribus</u>: demand curve does not remain static, constantly changes due to other factors affecting demand 6) Firms estimate, rather than accurately determine max profit o/p
7) Social/ envt concerns	<ul style="list-style-type: none"> • Use FOP which do not harm envt \rightarrow incur higher AC, MC \rightarrow lower SR profit • Adopt social/ envt concerns as part of branding to improve brand image \rightarrow align with csr T&P \rightarrow brand loyalty \rightarrow higher LR profit
8) Others	<ul style="list-style-type: none"> • Advertising, R&D (product/ process innovation) \rightarrow <u>sacrifice SR profit to increase LR profit</u>

Firm adjustment process e.g. MC decrease

- Profit-maximising output at Q_0 where $MR = MC$, MC rising
- Firm charges price P_0 , highest possible price given the demand to maximise profit
- When MC decreases, at original output Q_0 , $MR > MC$. Firm increases o/p to capture marginal profit, until Q_1 where $MR = MC$
- ...



Shifts in AC, MC, DD/AR, MR curves

Change in cost of variable input (e.g. wages)	AC, MC
Change in cost of fixed input (e.g. advertising, R&D)	AC only
Increase in demand	DD (parallel shift)
Increase in demand due to product differentiation	DD (pivotal shift/ steeper)
Reap iEOS	SRAC fall, SRMC fall Movement along LRAC curve

Market structure

Mkt structure	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Char	<ul style="list-style-type: none"> large no. of small firms homogeneous product no barrier to entry perfect knowledge 	<ul style="list-style-type: none"> large no. of small firms slightly differentiated product low barrier to entry imperfect knowledge 	<ul style="list-style-type: none"> few dominant firms differentiated / homogeneous product high barrier to entry imperfect knowledge 	<ul style="list-style-type: none"> single firm unique product complete barrier to entry imperfect knowledge
	E.g. primary product market (agriculture)	E.g. F&B	E.g. oil, telecommunication	E.g. utility (electricity, water)
LR profit	Normal profit Firms enter or leave industry such that marginal firm only makes normal profit (no BTE) → only normal profit in LR	Normal profit Firms enter or leave industry such that marginal firm only makes normal profit (weak BTE) → only normal profit in LR	Supernormal profit Supernormal profits not eroded as competition kept out (strong BTE) → retain supernormal profit in LR	Supernormal profit Supernormal profits not eroded as competition kept out (complete BTE) → retain supernormal profit in LR
AE	✓ No mark-up of P over MC	✗ Smaller mark-up of P over MC	✗ Larger mark-up of P over MC	✗ Larger mark-up of P over MC
PE (soc)				
PE (firm)	✓ Weak BTE, firms face intense competition Earn only normal profits in LR, any increase in cost will yield subnormal profits - forced to shut down and leave industry → maximise profits by minimising cost	✓ Weak BTE, firms face intense competition Earn only normal profits in LR, any increase in cost will yield subnormal profits - forced to shut down and leave industry → maximise profits by minimising cost	✗ Strong BTE, firms face less intense competition Firm can charge price high enough to cover high production cost while still earning supernormal profit (can afford to be X-inefficient)	✗ Strong BTE, firms face less intense competition Firm can charge price high enough to cover high production cost while still earning supernormal profit (can afford to be X-inefficient)

DE (w)	X Assumed homogeneous products - R&D is irrelevant	X Weak BTE: Supernormal profits in SR eroded due to entry of new firms -> do not enjoy benefit of R&D (unable to retain profits)	Tension Strong BTE: able to retain supernormal profit from R&D Strong BTE: already enjoy supernormal profit even without costly and risky R&D	Tension Strong BTE: able to retain supernormal profit from R&D Strong BTE: already enjoy supernormal profit even without costly and risky R&D
DE (a)	X LR normal profit: no financial means to engage in costly R&D	X LR normal profit: no financial means to engage in costly R&D	✓ LR supernormal profits: have financial means to engage in costly R&D	✓ LR supernormal profits: have financial means to engage in costly R&D
Equity	✓ Normal profit: revenue earned is just sufficient to compensate business owner for the opportunity cost in the use of resources No sustained redistribution of income from households to firms → equitable	✓ Normal profit: revenue earned is just sufficient to compensate business owner for the opportunity cost in the use of resources No sustained redistribution of income from households to firms → equitable	X Supernormal profit: revenue earned is in excess of what is needed to compensate business owner for the opportunity cost in the use of resources Sustained redistribution of income from households to firms → inequitable	X Supernormal profit: revenue earned is in excess of what is needed to compensate business owner for the opportunity cost in the use of resources Sustained redistribution of income from households to firms → inequitable
Csr choice	X Homogenous products	✓ Product differentiation → greater variety of products to choose from	✓ Product differentiation → greater variety of products to choose from	X No close substitutes

Factors affecting intensity of market competition

1. **Number and size of firms**
2. **Barrier to entry**

Structural	<ul style="list-style-type: none"> • Extensive iEOS to be reaped <ul style="list-style-type: none"> ○ Large firm reap iEOS → <u>lower AC</u> → charge lower price ○ Small firms with higher AC unable to <u>match</u> low price <u>without sustaining subnormal profits</u> ○ ⇒ market dominated by a few large firms 	
Strategic	<ul style="list-style-type: none"> • Aggressive pricing strategies: limit pricing, predatory pricing etc. • Product recognition: <ul style="list-style-type: none"> ○ <u>product differentiation</u> → enhance consumer brand loyalty → more difficult for rivals to induce brand switching ○ <u>high sunk cost</u> incurred → costly for rivals to engage in sizeable advertising campaign 	
Statutory	<ul style="list-style-type: none"> • Licences: issued by govt → grant exclusive rights to firm to supply a particular good, to limit competition • Intellectual property rights: patents, copyrights, trademarks → sole ownership on the use of ideas → confer monopoly power by <u>restricting imitation / duplication</u> • Tariffs and trade restrictions: Keep out foreign competition 	

3. Nature of product

- Homogenous product: price is sole point of comparison for consumers → firms under pressure to keep costs down to compete on prices ⇒ more intense competition
- Differentiated product: price is only one of many points of comparison for consumers → firms able to set prices ⇒ less intense competition

4. Access to information

- Consumers: compare prices and quality of firms' products → compel firms to compete more vigorously ⇒ more intense competition
- New entrants: possess common knowledge about market opportunities → enter market with similar products to compete against existing firms ⇒ more intense competition

Contestability

- Threat / potential entry of new entrants → firms behave in competitive manner
 - Charge lower prices (below SR profit-max level) closer to competitive market price at $P=MC$, accept lower supernormal profit → foreclose entry of competitors (unprofitable to enter market, as $SS \uparrow P \downarrow$)
- Characteristics:
 - Easy entry & costless exit (hit-and-run industry)
 - If there is supernormal profit to be reaped, firms can easily enter the industry
 - If subnormal profits, firms can easily exit the industry at no cost
 - New firms entering market can produce at same per unit cost as existing firms

Market power: ability to exert significant influence over quantity / price of good
(restrict o/p to push up price)

Strong market power	Weak market power	No market power
oligopoly, monopoly	MPC	PC
DD price inelastic <ul style="list-style-type: none"> few close substitutes each firm has large market share → large price-setting ability ⇒ larger mark-up of $P > MC$	DD price elastic <ul style="list-style-type: none"> many close substitutes each firm has small market share → small price-setting ability ⇒ smaller mark-up of $P > MC$	DD perfectly elastic <ul style="list-style-type: none"> identical goods firms can only take market price (intersection of market DD and SS) ⇒ no mark-up of $P > MC$

Strategies

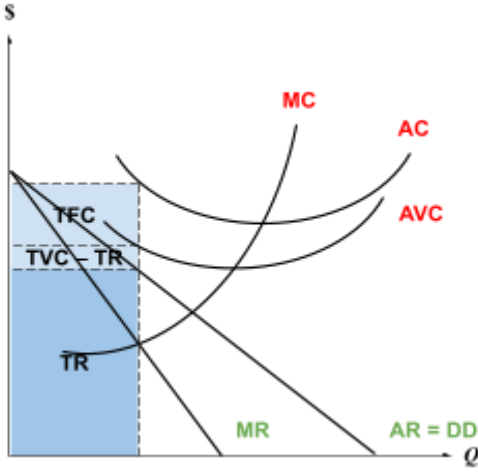
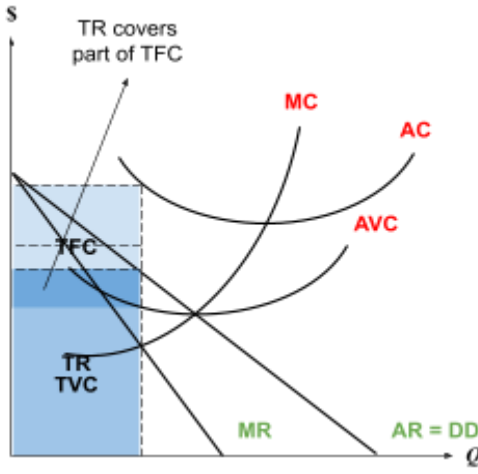
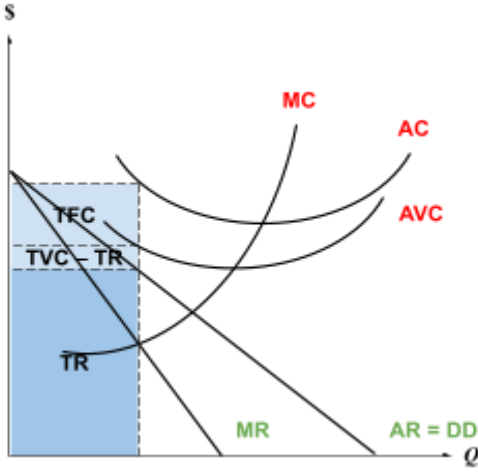
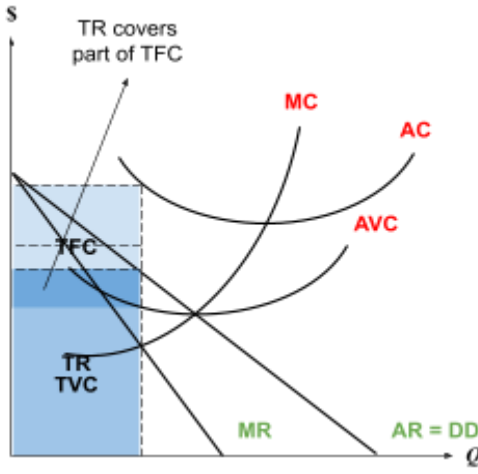
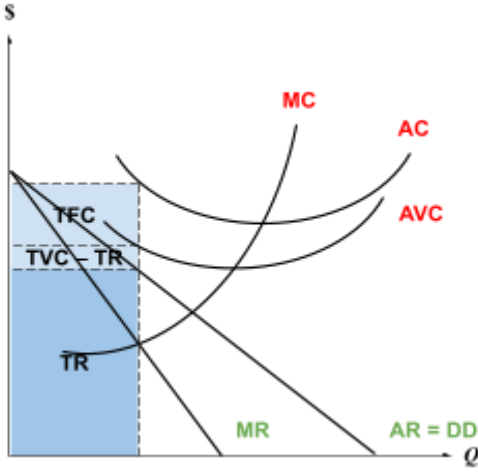
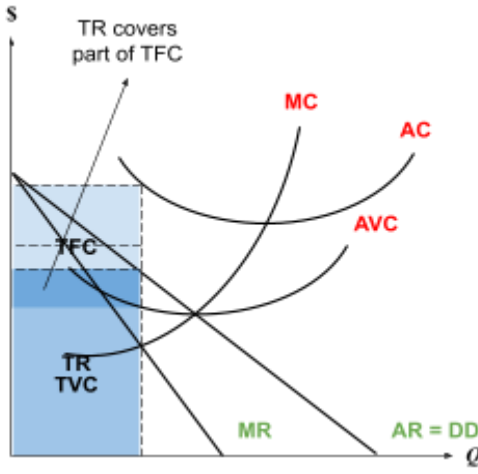
Mainly for oligopoly

In oligopolistic markets, firms could behave

- 1) competitively
 - price competition – price war, limit pricing, predatory pricing, price discrimination, price rigidity
 - non-price competition – product differentiation, mergers & acquisitions, diversification
- 2) collusively
 - cartel (explicit collusion)
 - price leadership (tacit collusion)

Strategic pricing

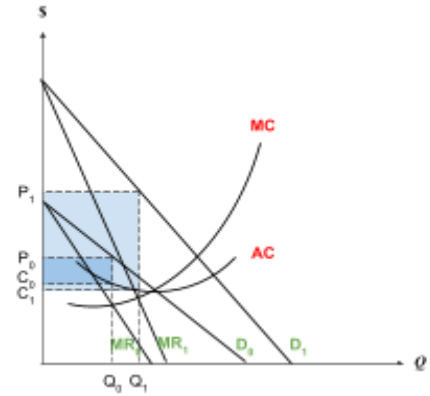
- WHAT: Each seller takes the actions and reactions of its rivals' marketing strategy into account when making its own production and marketing decisions
- WHY: Few large firms each command large share of the market
 - [willingness] Action by one firm has significant impact on DD of other firms → rivals respond to defend market share and profits (**mutual interdependence**)
 - [ability] Rival firms have financial reserves (accumulated from supernormal profits) to respond with counter-strategies to defend market share and profits → able to deviate from SR profit-maximisation to increase LR profit

Growth	[market adjustment process]										
Diversification	<p>Venture into other markets</p> <ul style="list-style-type: none"> Horizontal diversification: adds new products to a company's lines that are meant to serve existing customers → increase sources of DD ⇒ $DD \uparrow$ Vertical diversification: perform complementary stages of production within a single business unit → vertically integrate production stages → greater control over cost of FOP → $AC \downarrow$ <p>Limitations</p> <ul style="list-style-type: none"> Step into unfamiliar territory, provide low quality of G&S → unable to competitive with incumbents → limited increase in DD & TR Reap IDEOS 										
Shut down	<p>Decision to shut down / continue operation is aimed at <u>minimising loss</u></p> <table border="1"> <thead> <tr> <th>Short run ($TR < TC$)</th><th>Long run</th></tr> </thead> <tbody> <tr> <td>shut down if $TR < TVC$</td><td>shut down if subnormal profit</td></tr> <tr> <td>Variable cost (TVC) is avoidable, fixed cost (TFC) is unavoidable</td><td>All costs are variable in LR, unavoidable, better to earn nothing than to incur losses</td></tr> <tr> <td> <ul style="list-style-type: none"> $TR \geq TVC$: <ul style="list-style-type: none"> Shut down: loss = TFC Continue: TR cover TVC and <u>part of TFC</u> → <i>minimise loss</i> $TR < TVC$: <ul style="list-style-type: none"> Shut down: loss = TFC → <i>minimise loss</i> Continue: loss = TFC + (TVC – TR) </td><td> <ul style="list-style-type: none"> Normal profit: level of profit just sufficient to induce firm to stay in industry in LR Supernormal profit: level of profit more than what is necessary to induce firm to stay in industry in LR Subnormal profit: level of profit less than what is necessary to induce firm to stay in industry in LR </td></tr> <tr> <td> <p>Shut down:</p>  </td><td> <p>Continue:</p>  </td></tr> </tbody> </table>	Short run ($TR < TC$)	Long run	shut down if $TR < TVC$	shut down if subnormal profit	Variable cost (TVC) is avoidable, fixed cost (TFC) is unavoidable	All costs are variable in LR, unavoidable, better to earn nothing than to incur losses	<ul style="list-style-type: none"> $TR \geq TVC$: <ul style="list-style-type: none"> Shut down: loss = TFC Continue: TR cover TVC and <u>part of TFC</u> → <i>minimise loss</i> $TR < TVC$: <ul style="list-style-type: none"> Shut down: loss = TFC → <i>minimise loss</i> Continue: loss = TFC + (TVC – TR) 	<ul style="list-style-type: none"> Normal profit: level of profit just sufficient to induce firm to stay in industry in LR Supernormal profit: level of profit more than what is necessary to induce firm to stay in industry in LR Subnormal profit: level of profit less than what is necessary to induce firm to stay in industry in LR 	<p>Shut down:</p> 	<p>Continue:</p> 
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shut down if $TR < TVC$	shut down if subnormal profit										
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<p>Shut down:</p> 	<p>Continue:</p> 										

Price competition

Price war

- Firm lower price to increase market share
→ rival see $DD \downarrow$ → rival cut price to defend market share, protect profits cutting prices
- Price fall below AC → rival *unable to sustain losses* for extended period of time, shut down, exit industry → firm gain market share ⇒ higher LR profit

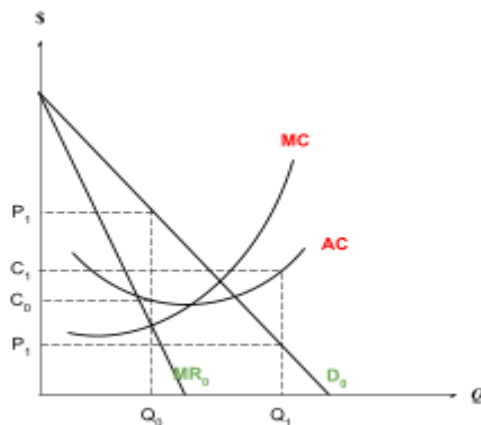


Limit pricing: deter entry of firms

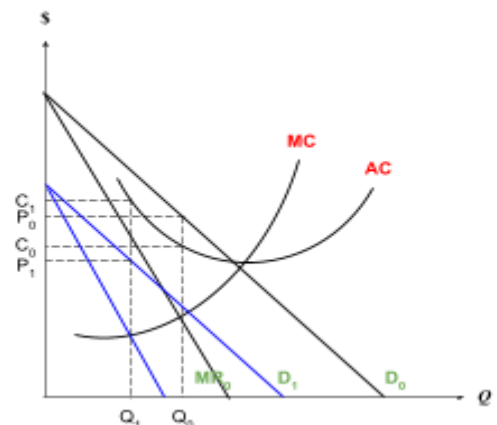
- Existing firm set low price → unprofitable for new entrants to compete
 - Price below that which max SR profit
 - Price low such that entry of new firm would add to mkt SS and push price further down *to the point that new entrant would face losses*
 - Price low but *sustainable* for existing firm
- Firms sacrifice current profits to maintain mkt power ⇒ higher LR profit

Predatory pricing: drive out existing competitors

- Predator set very low price (below MC / AVC)
- With low prices offered, csr switch away from rival's products → rivals' $DD \downarrow$ → subnormal profit → shut down in long run
- Firm raise price back to profit-max price, gain mkt share ⇒ higher LR profit



Incumbent firm

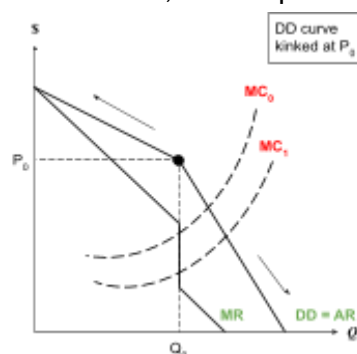


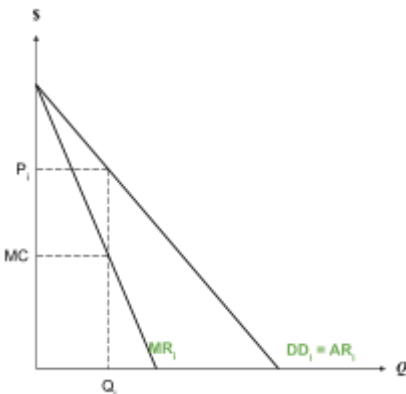
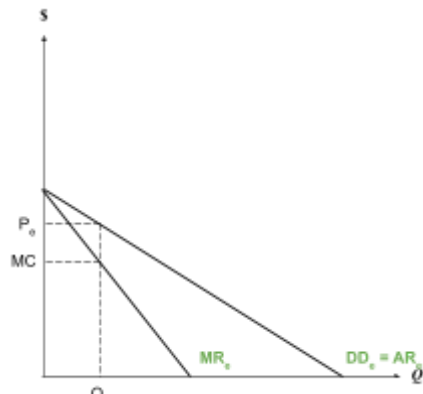
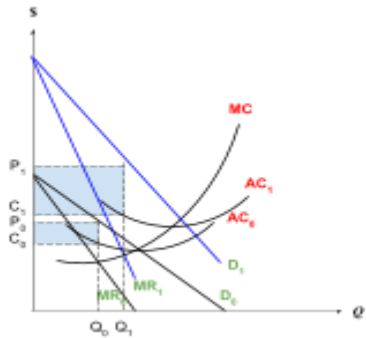
Rival firm

Price rigidity

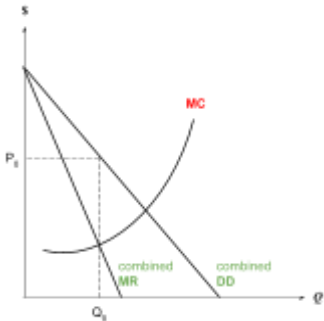
Kinked Demand Curve Theory

Reason: rival firms match price reduction, but not price increase



	<ul style="list-style-type: none"> • Prices stable without firms deliberately fixing prices <ul style="list-style-type: none"> ◦ Firm lower price below P_0: DD \uparrow, gain mkt share, TR \uparrow \rightarrow mkt share of rivals decrease, <u>follow</u> price cut to protect profits \rightarrow PRICE WAR \rightarrow firm's Qdd \uparrow LTP \rightarrow PED inelastic \Rightarrow profit decrease ◦ Firm raise price above P_0: more expensive than rivals \rightarrow by keeping prices constant, consumers switch to rivals \rightarrow larger mkt share (so <u>not follow</u>) \rightarrow firm's Qdd \downarrow MTP \rightarrow PED elastic \Rightarrow profit decrease • MR has discontinuous (vertical) section: even if MC shifts within discontinuous section of MR, o/p remains unchanged at Q_0
3rd degree price discrimination	<p>Charge <u>different prices</u> for the <u>same good</u> to different groups of consumers for reasons <u>not associated with cost differences</u></p> <p>Conditions:²</p> <ol style="list-style-type: none"> 1. <u>Same good</u> sold to diff market segments 2. <u>No cost difference</u> in supplying to diff market segments 3. <u>Price difference</u> not explained by cost differences <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p><i>inelastic sub-market</i></p> <p>Charge higher price \rightarrow Qdd \downarrow LTP \Rightarrow <u>TR</u> \uparrow</p> </div> <div style="text-align: center;">  <p><i>elastic sub-market</i></p> <p>Charge lower price \rightarrow Qdd \uparrow MTP \Rightarrow <u>TR</u> \uparrow</p> </div> </div>
Product differentiation	<p>Consumers do not regard products as identical</p> <p>\rightarrow DD rise, more price inelastic</p> <p>\rightarrow AC rise</p> <p>Advertising</p> <ul style="list-style-type: none"> • Create <u>perceived differences</u> in product <p>Improve product quality thru R&D</p> <ul style="list-style-type: none"> • Create <u>real differences</u> by introducing features that cater to csr T&P <div style="text-align: right;">  </div>

² To prove PD, check ALL boxes of the definition
To disprove PD, show breakdown of any one part of the definition

Collusion	<p>Oligopolists agree on price to limit competition</p> <p>Cartel (explicit collusion)</p> <ul style="list-style-type: none"> Firms <u>act as if they were a single monopoly</u>: o/p at Q_0 where combined MR = combined MC → <u>max combined profits</u> <ul style="list-style-type: none"> Price fixing: each firm follow market price set Output quota: allocated to each firm Output quotas for individual firms members / common price may not be individually profit-max <p>EG: Organisation for Petroleum Exporting Countries (OPEC)</p> <p>Price leadership (tacit collusion)</p> <ul style="list-style-type: none"> One of the oligopolists is <u>price leader</u> Price leader sets price, accepted as market price by other firms When price leader initiates change (in price / output) to <u>max its own profits</u>, other firms follow → may not max own profit 
Mergers and acquisitions (M&A)	<p>Reap iEOS (operate as one larger firm) → LRAC fall → SRAC fall, SRMC fall</p> <p>Horizontal merger: merge with firm in <u>same industry, same stage of production</u></p> <ul style="list-style-type: none"> Gain market share dominance → DD ↑ more price inelastic More fully exploit iEOS → lower MC, AC <p>Vertical merger: merge with firm in <u>same industry, different stage of production</u></p> <ul style="list-style-type: none"> Forward integration: move into <i>succeeding</i> stages of production → greater control over distribution, reduce dependency on middleman (distributors of end products) who might charge high fees → lower AC, MC Backward integration: move into <i>earlier</i> stages of production → greater control over FOP by producing FOP directly → lower AC, MC <p>Conglomerate merger: merge with firm in <u>different industry</u></p> <ul style="list-style-type: none"> <u>Diversity risk</u>: revenue not overly affected by decrease in DD for one product → reduce uncertainty & risks, esp. during recession

Cognitive biases → consumers make irrational purchase decisions

Firms can make use of cognitive biases in their strategies

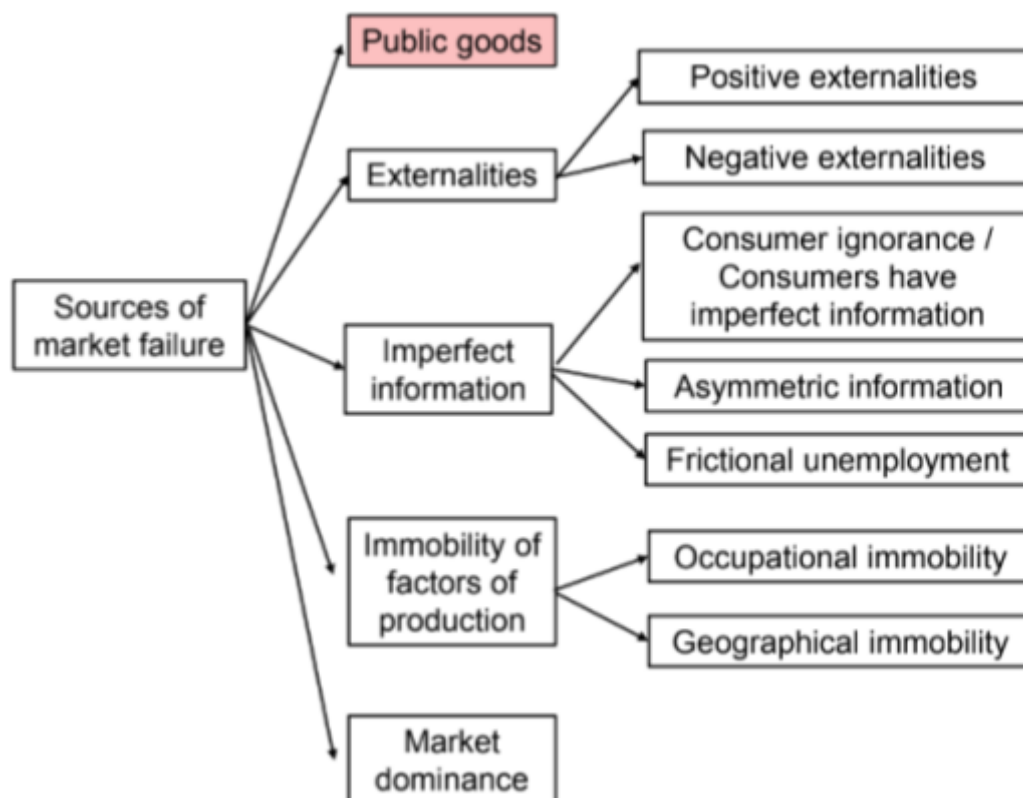
Sunk cost fallacy	Loss aversion	Salience bias
<p>Consumers consider sunk cost (cost <u>already been incurred</u> and <u>cannot be recovered</u>, bygone and should not be taken into consideration) when making decision</p> <p>[Consumers should only consider MB & MC]</p>	<p>Consumers experience losses more severely than equivalent gains → tend to prefer <u>avoiding loss</u> over making equivalent or greater gain</p>	<p>Consumers tend to focus on information that is more prominent over other less prominent but equally relevant pieces of information → make decisions according to elements that <u>appear more salient</u></p>

Market outcomes

Allocative efficiency: allocation of scarce resources that maximises society's welfare	<p>P = MC (no mark-up of P over MC)</p> <ul style="list-style-type: none"> P: value that consumers place on good MC: opportunity cost incurred by society to produce good P > MC: <u>Increase o/p will increase society's welfare</u> → <u>underproduction</u> (DWL) P = MC: Adjusting o/p will not bring about further increase in society's welfare 	
Productive efficiency: output produced with least costly combinations of inputs	<p>Society's POV: lowest point on LRAC, i.e. Q_{MES}</p> <ul style="list-style-type: none"> Falling section of LRAC: reap iEOS, can further <u>reduce unit CoP by increasing o/p level</u> Rising section of LRAC: experience iDOS, can further <u>reduce unit CoP by decreasing o/p level</u> Minimum point of LRAC (MES): fully enjoy iEOS, all iEOS exploited, avoid onset of iDOS, <u>cannot further reduce unit CoP by adjusting o/p level</u> 	<p>Firm's POV: any point on LRAC</p> <ul style="list-style-type: none"> LRAC = lowest possible average cost of producing any given level of o/p in LR To maximise profit, firms minimise cost → <u>produce on LRAC</u> x-inefficiency: produce same o/p at higher cost → <u>produce above LRAC</u>
Dynamic efficiency: technologically progressive (innovation, R&D) to meet consumers' changing needs and wants	<p>Product innovation</p> <ul style="list-style-type: none"> Improve <u>quality</u> of product Increase <u>variety</u> of product, expand consumers' choice → consumers able to find goods that better cater to their T&P ⇒ increase consumer welfare/ utility 	<p>Process innovation</p> <ul style="list-style-type: none"> Increase <u>productivity</u> → lower MC, AC → charge lower price to increase mkt share → increase csr purchasing power, able to buy more goods to satisfy more needs and wants ⇒ increase consumer welfare/ utility
Equity: fair distribution of wealth, income	<ul style="list-style-type: none"> Revenue earned is <u>just sufficient</u> to compensate business owner for the opportunity cost in the use of resources No <u>sustained redistribution of income</u> from households to firms 	
Consumer utility	<ul style="list-style-type: none"> Higher price → budget-constrained csr now pay higher prices on their purchases, leaving less budget to spend on other G&S → purchasing power decrease → csr utility ↓ 	

2.3 Market Failure

Market failure: free market, operating without government intervention, is allocatively inefficient, leading to society's welfare not maximised



Policies

Market-based	Command & control	Hybrid
Policies influence BUT final decision on how much to consume / produce ultimately rests with the market	Govt dictate o/p through laws and regulations, csr/ prs have to comply	Combination of both
<ul style="list-style-type: none"> • Taxes and subsidies • Public education / moral suasion • Pro-competition policies 	<ul style="list-style-type: none"> • Standards, bans • Compulsory competition • Govt provision • Direct price setting 	<ul style="list-style-type: none"> • Tradable permits

***When writing essay, cover different aspects of policies to give a scope of answers

Public goods

Non-provision in free market (missing market)

E.g. street lighting

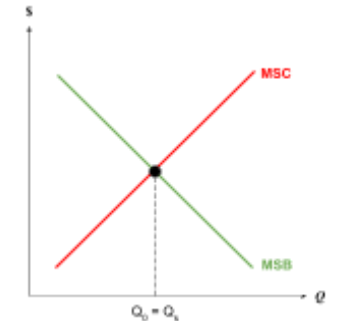
- **Non-rivalrous:** consumption by one person does not diminish qty for another person to consume
 - Cost of supplying the good to an additional consumer is zero → $MC=0$
 - To be allocatively efficient where $P=MC$, producers will have to charge zero → no rational producer will want to provide good
- **Non-excludable:** not possible or economically feasible to exclude someone from using the good even if he does not pay for it
 - Free-rider problem: non-payers can enjoy benefits of good paid by payers
 - No incentive for people to pay themselves and reveal their demand → no price signal → firms unable to charge a price for the good → unprofitable for firms to supply the good
- **Non-rejectability:** csr cannot reject benefits provided by good

free market allocates zero resources to provision of public good ⇒ complete market failure

*NO DIAGRAM!

Direct provision by govt

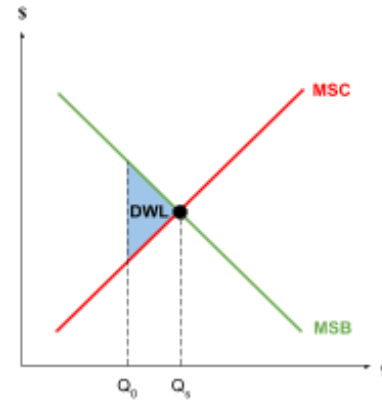
- Financed by tax revenue
- Govt decide what & how much to provide
 - Estimate MSB & MSC of producing & consuming the good → produce at Q_s where $MSB=MSC$



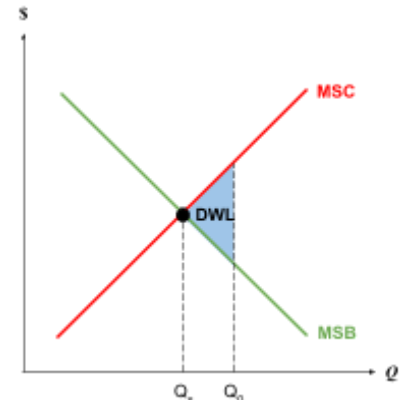
Effectiveness

- [-] Imperfect information on part of govt
 - Difficult to accurately calculate expected benefits i.e. ascertaining market price of the good as such a good has no price (which is a gauge of its value to csr) → DD for good is estimated through surveys or votes, and this information is used in cost-benefit analysis

Under-provision



Over-provision

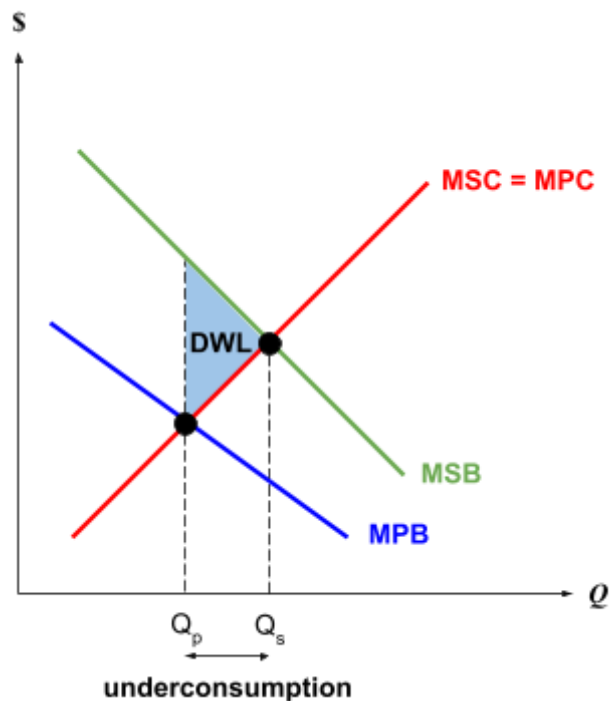


- [-] Inefficiency of state-owned enterprises: no profit motive and competition → incur higher costs than necessary (x-inefficient) & lower rate of innovation and quality of good
- [-] Opportunity cost: other public goods and merit goods foregone

Externality

Non-socially optimal levels of good

Positive externality: spill-over benefits on third party

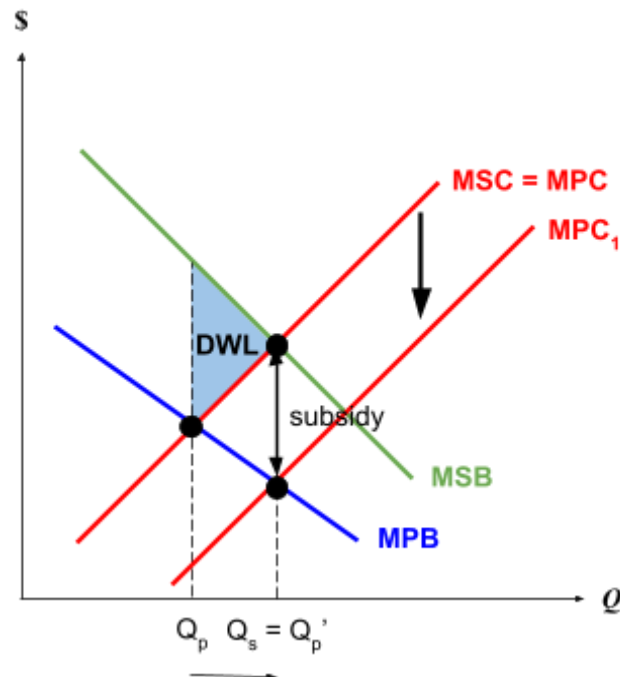


- Define MPB, MPC in the given context
- Individuals only consider MPB and MPC → consume private eqm output of Q_p where $MPB = MPC$
- Positive externality generates MEB: third parties enjoy spill-over benefits → additional benefit to society exceeds additional benefit to consumers/producers alone → $MSB > MPB$
- Socially optimal output at Q_s where $MSB = MSC$
- $Q_p < Q_s$ → under-consumption
- Output levels between Q_p and Q_s not consumed where $MSB > MSC$ → loss of additional benefit to

Market-based solution

Subsidy

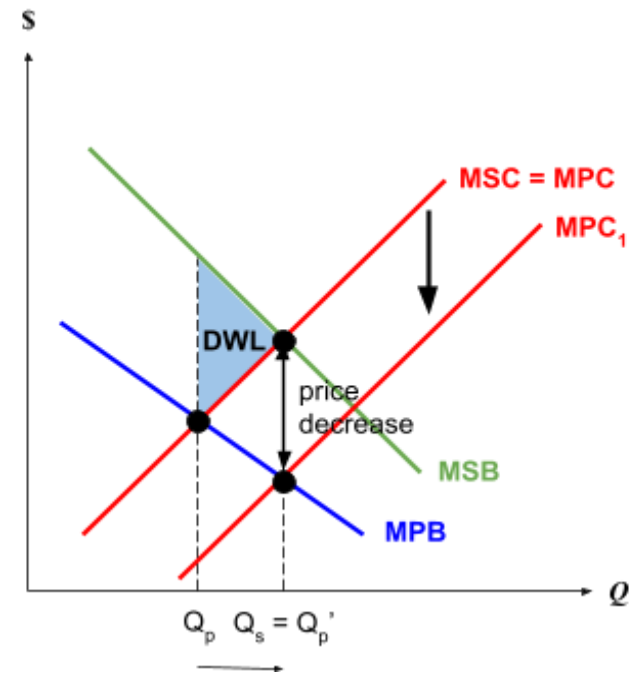
Direct subsidy



Granted to party that generates externality:

- **Subsidy = MEB at Q_s**
- Internalise external benefit: can now be captured in the form of cost savings → MPC decrease
- $Q_p' = Q_s$, eliminate DWL

Indirect subsidy

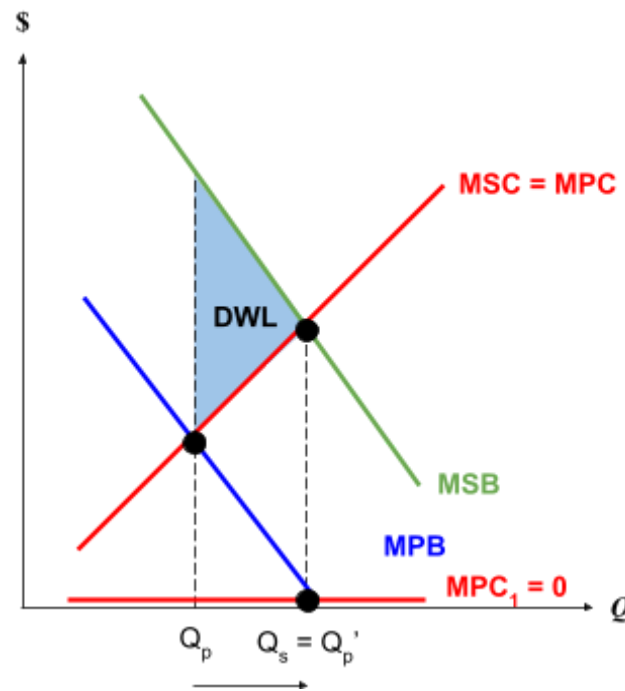


Granted to seller of good whose consumption generates externality:

- Incentivise prs to increase SS to capture positive marginal profits → downward pressure on mkt price
- **Price fall = MEB at Q_s**
- Lower price, MPC of csr decrease
- $Q_p' = Q_s$, eliminate DWL

society exceeds additional cost avoided → deadweight loss (society's welfare not maximised)

Free provision (100% subsidy): $MPC = 0$

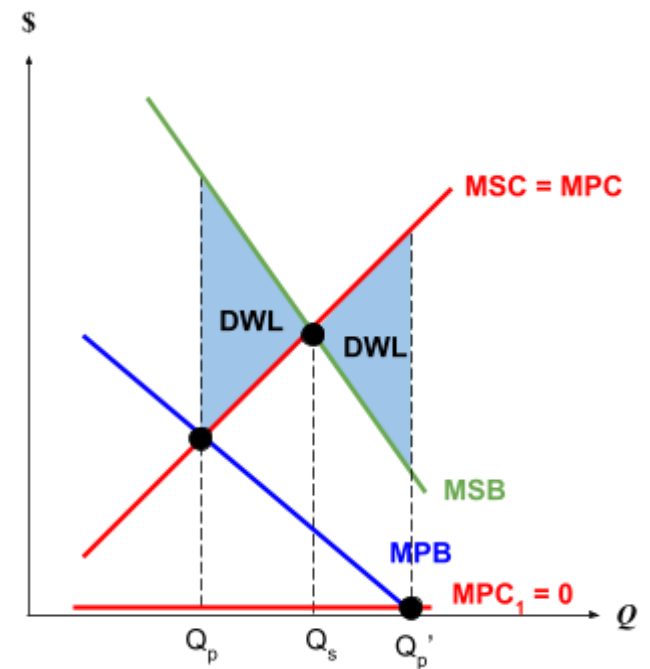


- $Q_p' = Q_s$

Effectiveness

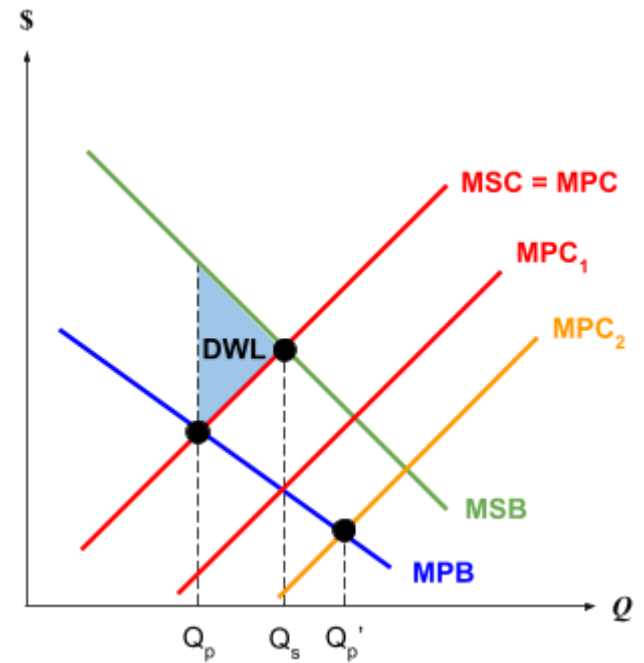
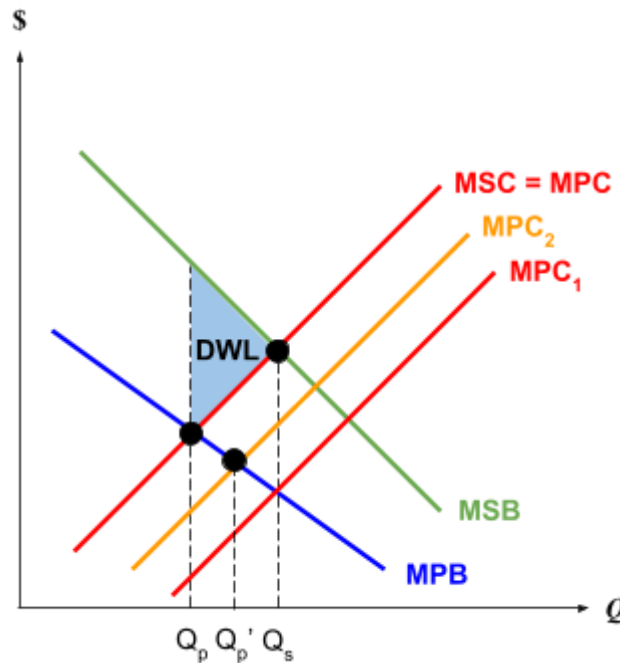
- [-] Imperfect information: difficult to accurately determine exact monetary value of external benefit → amount of subsidies → under- or over-subsidise

Under-subsidise



- $Q_p' > Q_s$ → **over-consumption**
- Compare both areas of DWL

Over-subsidise



- [-] Uncertain outcome: final effect on output depends on PED & PES
- [-] Govt budget
 - Worsen govt budget position
 - Opportunity cost of subsidy
 - Raise taxes to finance subsidy spending
- [+] Improve equity: lower final price of good esp. necessities (large % of income of low-income households) → progressive effect on income distribution
- [-] Firm inefficiency
 - Lower firms' cost, give them higher profits without doing anything → firms under less pressure to keep tight control over costs → x-inefficiency
 - Less impetus on firms to R&D to deliver better quality goods → dynamic inefficiency

Moral suasion

- Change people's attitudes and behaviours by
 - urging them to "do the right thing" – portray certain behaviour as prosocial and others as socially-unacceptable
 - draws on people's social preferences, their desire for status, to follow norms or to have a positive self-image from which individuals derive moral (dis)utility
- Encourage consumption / production of good by increasing public awareness and knowledge
 - Urge csr towards certain desired behaviour (**voluntary adoption**)
 - Incentive for firms to respond in shift in csr t&p

Effectiveness

- [+] Mindset change leads to enduring change
- [-] Mindset change takes time
- [-] Depends on receptiveness
 - Voluntary adoption depends on compliance cost – will voluntarily make the behavioural change if personal cost is low (monetary or otherwise)
 - [-] Voluntary adoption depends on whether it is in their interests to do so – if the activity is already widely practised, free rider problem can inhibit effectiveness of moral suasion (mask wearing)
 - Confirmation bias

C&C measure

Compulsory consumption

- MEB is so large that govt makes consumption of good compulsory
- Not everyone has the means to pay mkt price for the good → policy accompanied with free provision [graph]

Direct provision / nationalisation

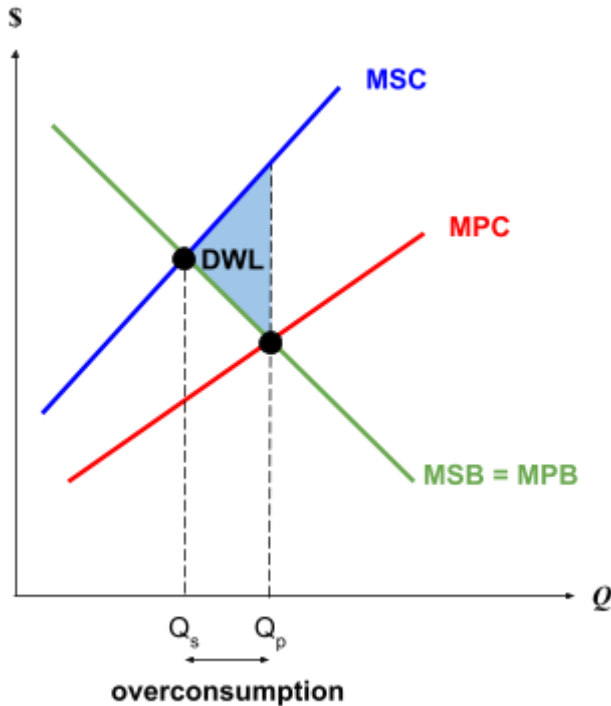
- Govt either produce good / contract it to private producers → govt control o/p, pass directives to product o/p based on its estimates on Qs

Effectiveness

- [-] High cost to govt
- [-] Inefficiency of state-owned enterprises

Non-socially optimal levels of good

Negative externality: spill-over costs on third party

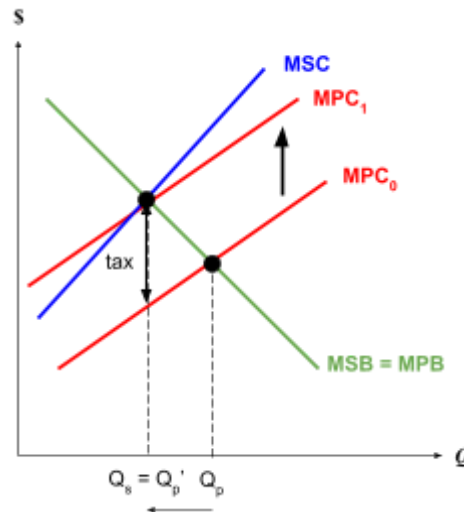


- Define MPB, MPC in the given context
- Individuals only consider MPB and MPC → consume private eqm output of Q_p where $MPB = MPC$
- Negative externality generates MEC: third parties experience spill-over costs → additional cost incurred by society exceeds additional cost incurred by consumers/producers alone → $MSC > MPC$
- Socially optimal output at Q_s where $MSB = MSC$

Market-based solution

Tax

Direct tax



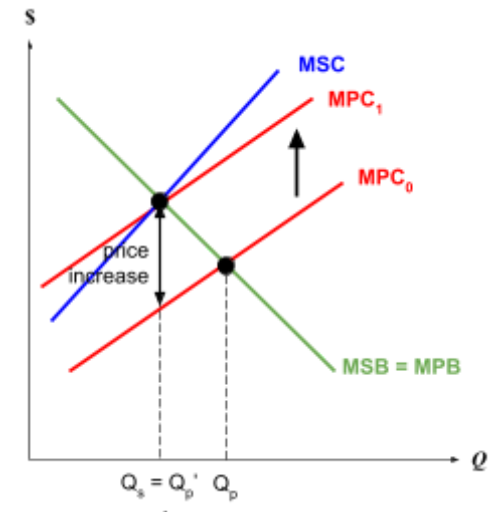
Imposed on party that generates externality:

- MPC incurred by csr/ prs increase
- **[Internalise]** external cost: can no longer be disregarded by csr / prs → now face the full cost (private + tax) of their actions]
- **Tax = MEC at Q_s**
- New eqm at Q_p' coincide with Q_s

Effectiveness

- [+] Tax revenue to finance other projects
- [+] Firms incentivised to R&D, innovate and adopt green solutions to reduce tax paid → reduce MEC
- [+] Harness cognitive biases
 - Saliency bias: make certain info more prominent to get ec agents to be more responsive to policy
 - Loss aversion: penalties on negative behaviour tend to be more effective than rewards on positive behaviour
- [-] Imperfect information on the part of the govt: unable / difficult to accurately determine monetary value of externality → under- or over-estimate MEC

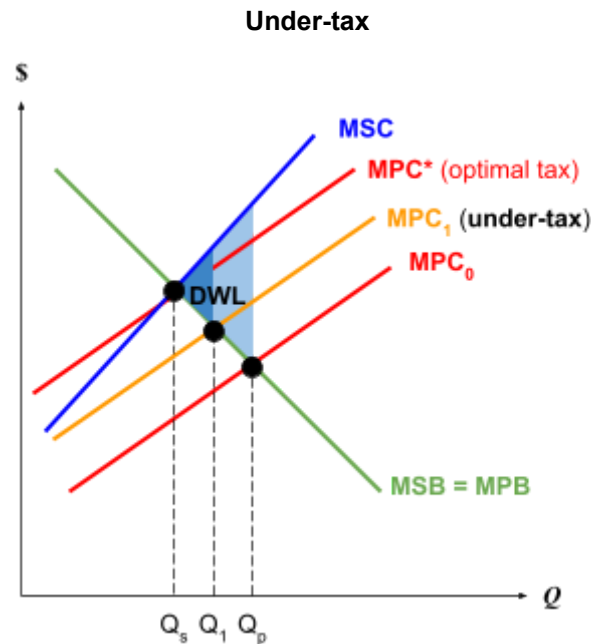
Indirect tax



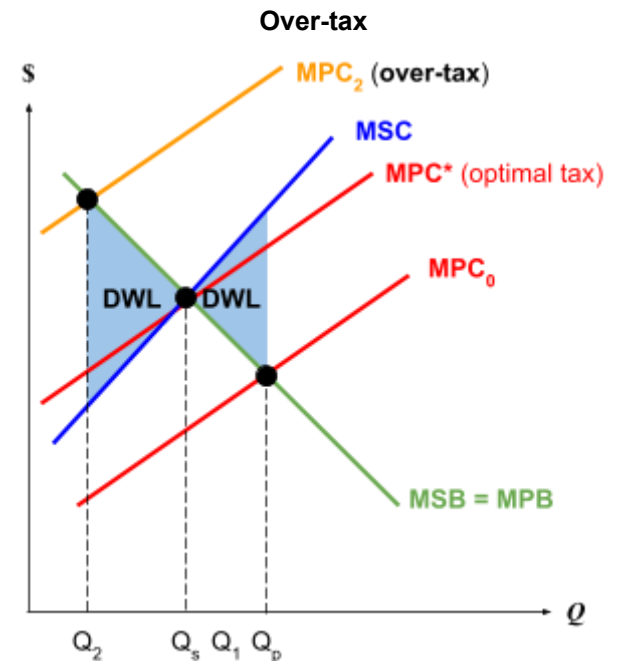
Imposed on prs of good whose consumption generates externality:

- Raise marginal cost of prs → reduce SS to avoid marginal losses → pass on part of the increase in marginal cost to csr by raising prices → MPC incurred by csr increase
- **Price increase = MEC at Q_s**
- New eqm at Q_p' coincide with Q_s

- Consumers acting in pursuit of self-interest disregard MEC, consume up to Q_p : $Q_p > Q_s \rightarrow$ **over-consumption**
- Output levels between Q_p and Q_s consumed where $MSC > MSB \rightarrow$ society bear cost in excess of benefits \rightarrow **deadweight loss** (society's welfare not maximised)



- Reduce o/p towards Q_s but does not totally eliminate over-production
- Smaller DWL \rightarrow net improvement in society's welfare



- Reduce o/p so far that it is below $Q_s \rightarrow$ over-production becomes under-production (one inefficient point \rightarrow another inefficient point)
- Compare both areas of DWL \rightarrow net improvement in society's welfare

- Monitoring and enforcement
- Uncertain outcome - depends on PED & PES
 - PED inelastic \rightarrow o/p decrease to small extent \rightarrow undermine effectiveness
- [+] Tax revenue - finance project to remedy situation, or compensate third parties
- [+] Tax revenue - reduce other taxes
- [-] Equity: regressive taxes on goods that take up larger percentage of incomes of low-income households \rightarrow worsen income distribution

Moral suasion

C&C measure

Bans

- $MSC > MSB$ over all outputs

Effectiveness

- [-] Imperfect information on the part of the govt

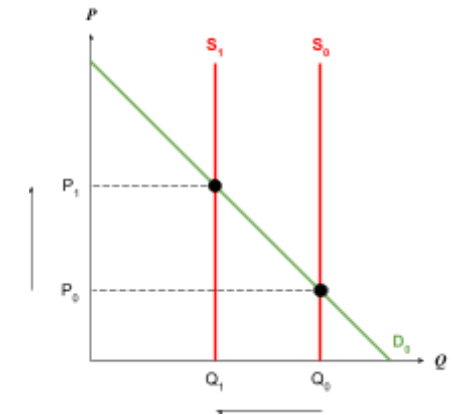
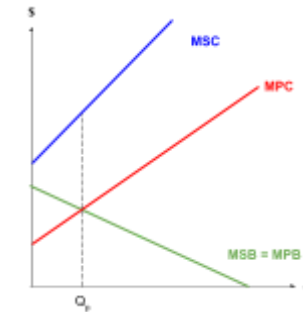
Hybrid measure

Tradable permits (cap-and-trade)

C&C	Mkt
Govt decides on no. of permits to issue	Price of permits determined by interaction of market forces of DD & SS <ul style="list-style-type: none">• SS is perfectly inelastic, fixed by govt• DD depends on factors e.g. economic activity, technology
Intended outcome: <ul style="list-style-type: none">• Progressively reduce SS of permits to achieve long-term target e.g. reduce CO_2 emissions• SS decrease \rightarrow push up price of permits (carbon price) \rightarrow incentivise prs to switch to low-carbon technology	

Effectiveness

- [+] Efficient distribution
 - Permits will go to those who value them most (signalled by willingness to pay higher price to bid)
- [+] Revenue for govt
 - Fund the transition to green tech / public transport
 - Compensate the group adversely affected
- [+] Certain outcome
 - No matter how the market eventually distributes the permits, the permits determine the cap
- [+] Efficient distribution
 - SELL: Firms that are able to reduce emissions more cheaply will choose to do so & sell the unused emissions permits



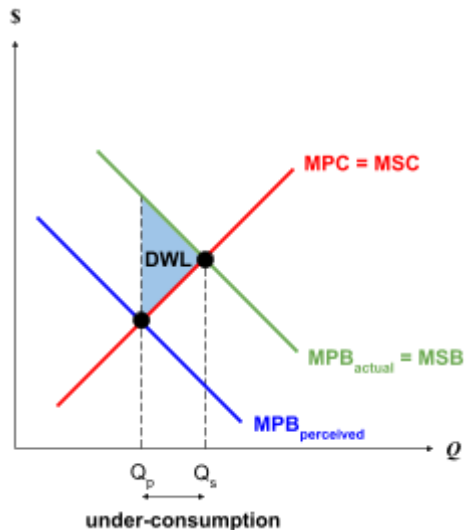
- BUY: Firms that find it costly to cut emissions will choose to buy permits to avoid having to cut emissions much
- Outcome: Emissions cut (cap) achieved at the lowest cost to society
- [-] Price volatility
 - Price of permits determined by interaction of mkt forces of DD & SS
 - In periods of decreased economic activity (recession) → decrease DD for permits → decrease in price of permits [graph] → may be cheaper to simply purchase permits rather than invest in low-carbon technology
 - Implication: Govt has to anticipate the decrease in DD → decrease SS simultaneously
- [-] Cognitive biases
 - Having paid so much for COE (tradeable permit) of car ownership, csr want to average down the cost of such spending by using their cars more!!
- [-] Cheating
 - Requires monitoring, enforcement and deterrence

Imperfect information

Non-socially optimal levels of good

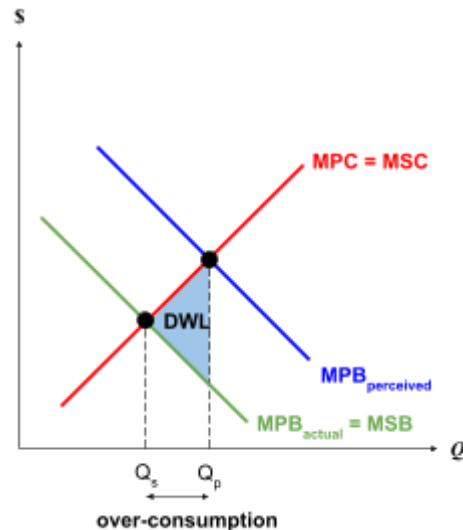
Consumer ignorance

Merit good



- Define MPB & MPC
- Consumers not aware of full extent of benefits → underestimate benefits → perceived MPB < actual MPB
- Shaped by imperfect information, consumers consume up to private eqm level Q_p where perceived MPB = MPC
- Socially optimal level Q_p where $MSB = MSC$
- **Under-consumption** → DWL

Demerit good



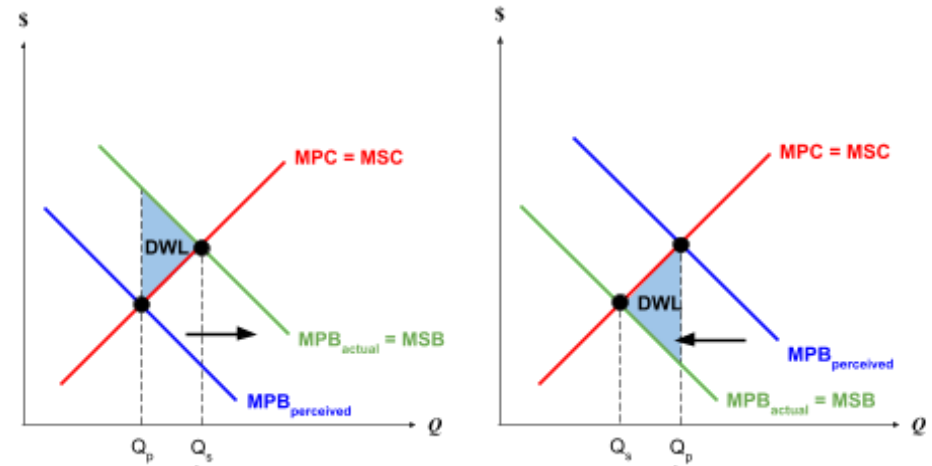
- Define MPB & MPC
- Consumers not aware of full extent of harm → overestimate benefits → perceived MPB > actual MPB
- Shaped by imperfect information, consumers consume up to private eqm level Q_p where perceived MPB = MPC
- Socially optimal level Q_p where $MSB = MSC$
- **Over-consumption** → DWL

Asymmetric information

One party has more information than another party regarding characteristics of

Market-based solution

Close information gap



Public education

- Govt provide accurate, comprehensive, timely information
- Shift perceived MPB towards actual MPB → move Q_p towards Q_s

Legislation

- Govt introduce laws to
 - prohibit false and misleading information e.g. false advertising
 - mandate information disclosure
- Shift perceived MPB towards actual MPB → move Q_p towards Q_s

Effectiveness

- [-] Voluntary nature
 - depends on receptivity of csr, outcome highly uncertain
 - Confirmation bias: people seek out or evaluate information in a way that fits with their existing thinking and preconceptions → reject public education messages sent out by govt
- [-] Govt budget, opp cost

goods and services for sale

- **Adverse selection**

Products of different qualities are sold at a single price because seller/buyer incentivised to conceal information → buyer/seller not sufficiently informed to determine true quality at the time of purchase

Second hand car market: (lemon problem)

- Seller has more information about quality of used cars than buyer → seller hide some info from buyer
- Buyer has less information on quality of good → run risk of being sold low quality good → offer lower price
- Sellers of **plums** unwilling to offer good for sale → leave market → only **lemons** offered for sale
- Market adversely selects against plums in favour of lemons
- More and more sellers of plums leave market → market increasingly dominated by lemons → extreme situation where market for plums disappears → potentially Pareto improving exchanges do not take place → potential net benefit to society from having some good quality goods exchanged is lost → society welfare not maximised ⇒ allocative inefficiency

Insurance market:

- Buyer has more information about his health condition than seller + seller unable to adequately monitor buyer's behaviour
- Individuals with poor health more likely to want insurance → proportion of individuals with poor health in pool of insured people increases
- Claims from customers rise → rise in cost → charge higher premium to protect profit
- Marginal cost of purchasing insurance increases, only consumers who expect to reap sufficiently high marginal benefits will purchase insurance (poor health) → healthier individuals with low risks choose not to be insured
- Market adversely selects against healthy individuals in favour of

Infrastructure to improve information flow (frictional unemployment)

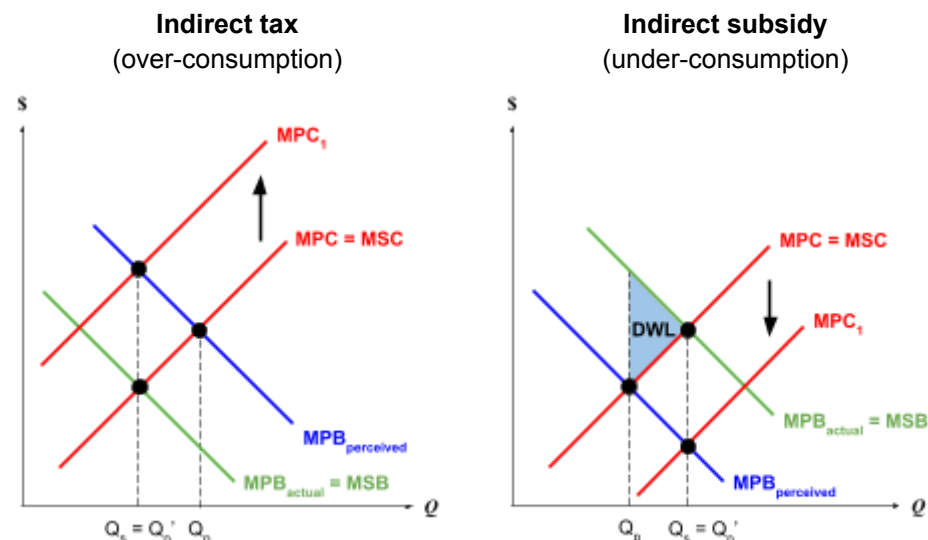
- Govt set up job matching platforms / infrastructure e.g. jobs fair

Lemon Law (asymmetric information)

- Legislation that provides consumer protection for defective goods
- Consumers have the right to request repair, replacement, reduction in price, rescission of contract for goods that do not conform to contract / of unsatisfactory quality or performance standards
- Avenues for csr to seek recourse → reduce incentive for seller to attempt to sell defective goods / hide defects

Tax and subsidy

**does not correct root cause (information failure)



- Tax levied on prs: increase marginal cost of production → firms decrease SS to avoid marginal losses → charge higher price of good → pass on part of cost increase to csr
- MPC incurred by csr increase
- Subsidy granted to prs: decrease marginal cost of production → firms increase SS to capture marginal profits → charge lower price of good → pass on part of cost decrease to csr

individuals with poor health

- ... fewer Pareto improving exchanges ...

• **Moral hazard**

Tendency to change behaviour when the cost of that behaviour will be borne by the other party, after contract agreed upon

Insurance market:

- Buyer has more information about his health condition than seller + seller unable to adequately monitor buyer's behaviour
- Buyer more willing to take on high-risk activities since covered by insurance
- Increase likelihood of insurance payout → more claims, rise in cost → companies charge higher premium to protect profit
- Insurance companies' cost rise to the point that they no longer make profit → no longer provide service → missing market

• **Supplier-induced demand**

- Seller has more knowledge than buyer, profit-maximising seller uses superior knowledge to influence demand in his self-interest → perceived MPB > actual MPB
- Shaped by imperfect information, consumers consume up to private eqm level Q_p where perceived MPB = MPC
- Socially optimal level at Q_p where MSB = MSC
- **Over-consumption** → DWL

• **Real-wage unemployment**

- Firms have imperfect info about worker productivity (monitoring of workers is costly or impossible) → workers incentivised to shirk as less likely to be caught for shirking
- To discourage shirking, firms pay higher wages to raise marginal cost of shirking (lost of income when fired from job)
- Wages above mkt eqm wage → surplus labour → **unemployment**

- MPC incurred by csr decrease

Effectiveness

- Effect on govt budget
- Imperfect info
- PED / PES more inelastic → less effective in altering consumption level → requires more tax / subsidy

C&C measure

Regulation and legislation

Restriction on consumption (over-consumption as perceived MPB > actual)

- Restrict consumption thru total bans, partial bans → reduce consumption towards Q_s
- SG: casino exclusion measures

Compulsory consumption (under-consumption as perceived MPB < actual)

- Raise consumption level towards Q_s
- SG: Compulsory Education Act

Direct provision (under-consumption)

- Govt produce the good → charge lower price / offer it free → raise consumption towards Q_s

Effectiveness

- [-] Imperfect info on the part of govt
- [-] Direct provision → high cost to govt & inefficiency of state-owned enterprises

Frictional unemployment

- Workers have imperfect info about types of jobs available
Employers have imperfect info about type of available labour (due to high search cost involved in acquiring information)
- Workers are w/a to work at prevailing wage rate, actively searching for jobs but do not have jobs
- Pareto improving exchanges do not take place: workers get higher income, employers make higher profits
- Productive inefficiency as o/p of G&S is below its potential o/p (opp cost of unemployment is the o/p forgone) → society's welfare below max attainable level

[PPC]

Factor immobility

Non-socially optimal levels of good

Occupational immobility

Barriers to mobility of FOP between different industries and uses

- Workers retrenched from declining industry → job-specific skills not transferable to other industries → **mismatch** b/w skills possessed by unemployed & skills demanded by employers
→ occupationally immobile ⇒ structural unemployment

Continuing education and training (CET)

- Retraining and upgrading skills of displaced workers whose skills have become obsolete
- Govt provide tax incentives or subsidies to firms to induce them to send workers for upgrading courses

Reform education system

- Revamp and gear education system towards the needs of the economy e.g. digital / care / green economy

Geographical immobility

Lack of willingness and ability of FOP to move between and within countries

- Retrenched workers in economically-depressed regions: social ties e.g. family ties or financial factors e.g. high cost of relocation → unable / unwilling to relocate to take up jobs in other areas which are booming
→ geographical immobile ⇒ structural unemployment

Move workers to jobs

- Govt provide financial assistance to individuals who are willing to relocate in order to find employment for which they are qualified by reason of training and experience – mobility assistance programme for the unemployed

Move jobs to workers

- Govt use tax and financial incentives to attract investment → direct it into certain locations e.g. regions with high unemployment

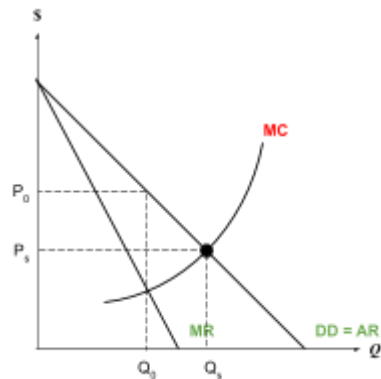
Inability of factor of production to shift from one location to another → unemployment of resources (point lies inside PPC)

- Moving from point will lead to improvement in society's welfare - with more output produced, more wants can be satisfied and higher level of utility attained
- Raise production of one good without sacrificing production of another good
- Factors of production left idle, society incurs opportunity cost in terms of forgone output → society's welfare below max attainable level



Market dominance

Non-socially optimal levels of good



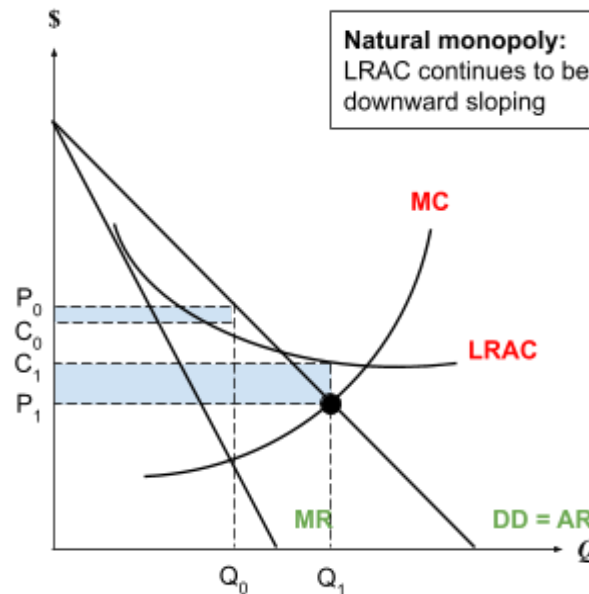
- In imperfect market structure, firm possess market power → price setting ability → downward sloping DD curve
- Allocative efficiency: society produces and consumes a combination of G&S that maximises welfare → society's valuation of last unit of G&S (Price) is equal to value of resources that go into producing that last unit of G&S (Marginal Cost) → $P=MC$
- Profit-maximising output at Q_0 where $MR=MC$, charge price P_0 given DD
- Socially optimal output at Q_s where $P=MC$ ($MSB=MSC$)
- Underproduction of G&S as $Q_0 < Q_s$
- Over Q_0Q_s units, value of benefit to society > cost incurred by society in producing one additional unit → loss of net potential benefit to society → DWL

Direct price setting (price cap)

MC pricing

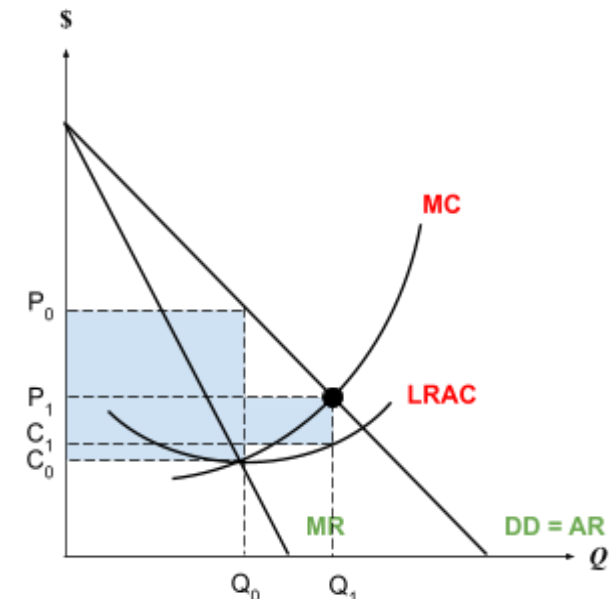
Monopolist required to charge $P=MC$ (allocative efficient o/p level) → lower price, higher o/p level

Natural monopoly



- Extensive iEOS (cost structure of industry) → LRAC falls over entire range of mkt DD
- Firm makes subnormal profit → no private firm willing to enter mkt to supply good → govt needs to subsidise loss

Artificial monopoly



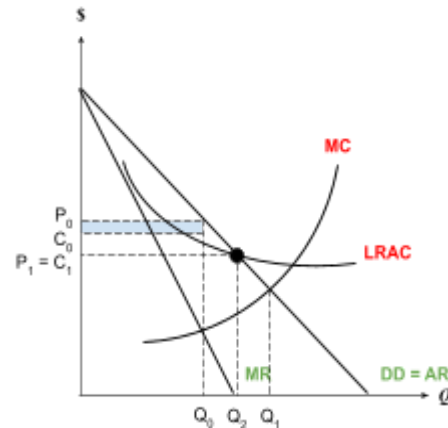
- Created by statutory / strategic BTE
- Firm continues to make supernormal profit → no need subsidy

AC pricing

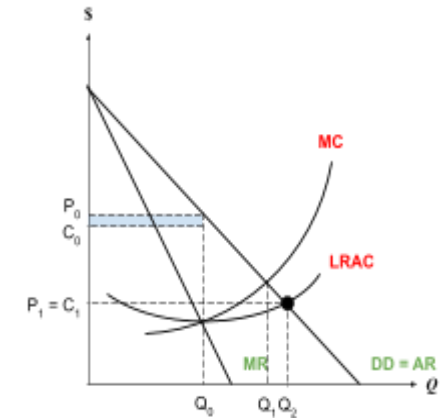
Monopolist required to charge $P=AC$ (close to allocative efficient o/p level) → lower price, higher o/p level

Firms makes normal profit → no need for govt to subsidise

Natural monopoly



Artificial monopoly



- New o/p closer to allocative efficient o/p level → size of DWL reduced
- New o/p overshoots allocative efficient o/p level → compare size of two DWL

BOTH

- Reduce allocative inefficiency / achieve allocative efficiency
- Increase consumer surplus, greater equity
- Reduce X inefficiency

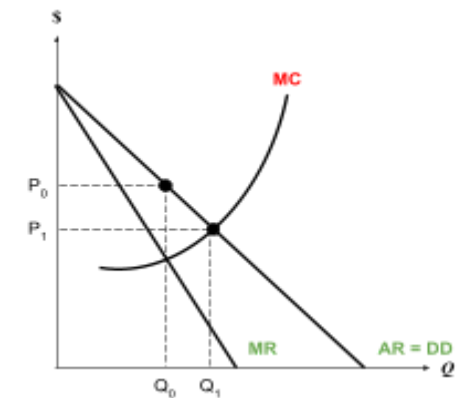
Effectiveness

- [-] Loss of productive efficiency & dynamic efficiency
 - Any successful efforts by firms to cut costs are passed on to csr, not retained by firms as additional profits → lack incentive to cut costs via innovation
- [-] Asymmetric information
 - Firms know more about their own costs than regulators → incentivised to overstate costs → charge higher price & produce at lower o/p → undermine effectiveness of policy

Pro-competition policy

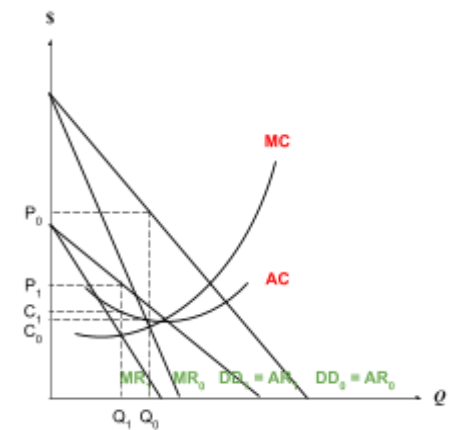
Antitrust law

- Penalise anti-competitive practices OR break up monopolies into smaller independent units → increase competition → firms act more competitively → lower price and increase o/p → smaller mark-up of $P > MC \Rightarrow$ reduce allocative inefficiency



Market liberalisation to improve market contestability

- Dismantle/relax laws that form statutory BTE e.g. grant licences to new firms → introduce competition, more firms enter mkt → weaken mkt power of incumbent firms → DD fall + more elastic
- Smaller mark-up of $P > MC \Rightarrow$ reduce allocative inefficiency
- Supernormal profit reduced \Rightarrow reduce inequity
- Incumbents incentivised to produce on LRAC, minimise losses to protect profits → reduce X inefficiency / productive inefficiency
- Incumbents incentivised to R&D to protect profits → dynamic efficiency



Effectiveness

- [-] Loss of productive efficiency: firms make less supernormal profits → less channelled to fund R&D
- [-] Less cost savings ...
 - Smaller o/p → less able to reap iEOS → higher MC, AC
- [-] Less productive efficient (society's view): smaller o/p → produce further away from MES
- [-] Difficult to prove that firms actually collude / engage in anti-competitive actions

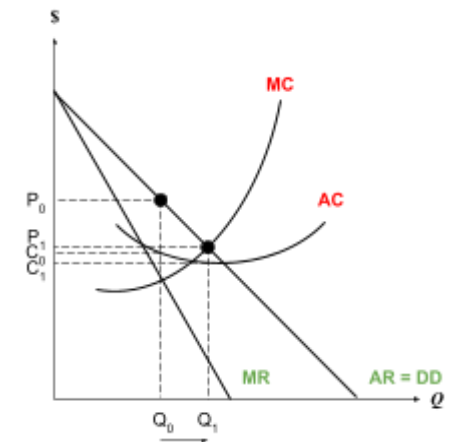
Nationalisation

Market liberalisation to improve market contestability

- Govt acquire private company → nationalised industry operate in public interest → produce at larger o/p & charge price closer to that in competitive mkt → smaller mark-up of $P > MC$ ⇒ reduce allocative inefficiency
- Size of supernormal profit reduced ⇒ reduce inequity

Effectiveness

- [−] Inefficiency of state-owned enterprises
- [+] Govt budget: supernormal profits made by monopoly adds to govt budget

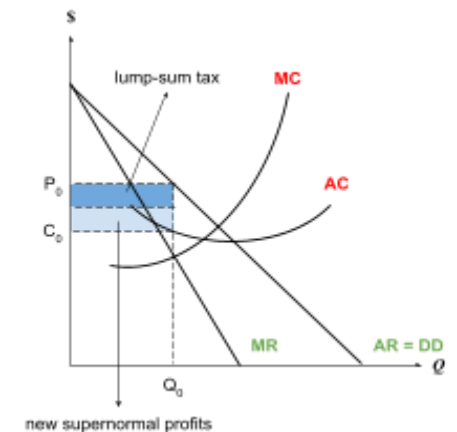


Lump-sum tax

- reduce size of supernormal profit → reduce income inequity

Effectiveness

- [−] Asymmetric information: firms know more abt amount of profit earned than regulators → incentivised to cheat by understating profits earned → reduce tax faced → undermine effectiveness of policy
- [−] Does not improve allocative efficiency: does not affect firm's MC → profit-max P & Q remains the same
- [−] Reduction in dynamic efficiency: any additional profits earned are taxed by govt → reduce firms' w/a to innovate
- [+] Govt budget: collect more tax revenue → improve budget position
 - Use tax revenue to redistribute to low-income households



Inequity

- Free market responds to “dollar votes”: resources allocated in order to satisfy consumers’ effective DD (i.e. w/a to buy) → csr with higher incomes are likely to determine which G&S will be produced
- Resources allocated to production of G&S demanded by csr with higher income
- G&S priced out of reach of low-income csr due to the lack of ability to pay → not be provided to those who do not have effective DD even when they need it
- Market forces allocate resources based on wants rather than needs → distributive failure, where resources over-allocated to the rich & under-allocated to the poor ⇒ inequity

Cooling measures (housing market)

Reduction of Loan-to-Value (LTV) limit

- LTV limit determines maximum % of a property’s appraised value or purchase price that a lender is willing to finance through mortgage loan
- Lower LTV limit → households able to secure reduced amount of funds to purchase housing (via mortgage loans) → discourage potential homebuyers → DD for housing fall ...

Elevation of Additional Buyer's Stamp Duty (ABSD) & Seller's Stamp Duty (SSD)

- ABSD: property tax imposed on individuals who own properties in SG, includes both residential and commercial real estate
- SSD: tax levied on properties that are sold within a short holding period
- These measures discourage property flipping and short-term speculation → reduce DD in the housing market → ... price fall → more affordable

Exercises

Scarcity

Using the PPC, explain the concept of scarcity, choice and opportunity cost. [10]

Introduction

- Explain how scarcity → choice → opportunity cost
- **[Reason for scarcity]** Limited resources, unlimited human wants
- Relevant **definitions**

Introduction to PPC

- **[Address point]** PPC reflects scarcity, choice, opportunity
- **Definition** of PPC

Overview of PPC

- **Diagram** and **explanation**

Explain how PPC reflects scarcity

- **[Address point]** increase production capacity in economy → outward shift in PPC → decrease scarcity, vice versa
- **[Explain & Elaborate]** increase in quantity and quality of factor of production
- **[Example]** Education and training → greater human capital
- Hence PPC shifts outwards

Explain how PPC reflects choice

- **[Address point]** change in taste & preference → movement along PPC → change in choice
- **[Explain & Elaborate]** change due to technological advancement
- **[Example]** invention of smartphones and tablets → consumers prefer electronic publications → market more inclined to produce more electronic publications

Explain how PPC reflects opportunity cost

- **[Address point]** PPC is concave to origin because opportunity cost of producing good increases as its quantity increases
- **[Explain & Elaborate]** as economy produces more of a good, it has to use resources not equally suitable for production of different goods → give up producing more units of other goods to produce each additional unit of the good
- **[Example]** farmer use less fertile land to increase production of strawberries → yield of strawberries per acre of land decreases
- Hence PPC is concave

Demand and supply

Typical part (a) questions

- Impact on DD/SS, TE/TR
- Explain sharp rise in price
- Explain how price mechanism works

Typical part (b) questions

- Policy – consider DD/SS-side, price floor/ceiling, diversification etc.

NYJC 2023 Q1(a)

Singapore recorded an increase in attrition rates among local and foreign nurses in the public sector in 2021, compared with 2020. The number of nurses now is 58,000 and Ministry of Health estimates that this will need to grow to 82,000 by 2030 as one in four Singaporeans will be aged 65 and above, up from one in six today. The base salaries of public healthcare nurses were also increased between 5 and 14 per cent.

Explain why a shortage of nurses might still exist even with the rise in the salaries of nurses. [10]

- R1: Shortages might still exist due to inelastic demand and supply of nurses → larger wage increase required to eliminate shortage
- R2: Shortages might still exist due to increase in demand and/or fall in supply of nurses

RI 2023 Q1(a)

Singapore's property market prices rose 10.6% in 2021 and 8.6% in 2022. Construction delays, manpower crunch and supply chain bottlenecks have contributed to the rising prices. In response, authorities raised buyer's stamp duty, tightening the maximum loan limit while ramping up supply of public housing of BTO.

Explain the persistent shortage in the public housing market despite the rise in price. [10]

- R1: High demand and fall in supply
- R2: Price inelastic demand and supply

RVHS 2023 Q1(a)

Malaysia is introducing an export ban on chicken, in addition to the existing price ceiling to keep chicken prices low domestically. Singapore imports live chickens from only Malaysia and this makes up 34% of its overall chicken supply - the most widely consumed meat here. Concurrently, there are also campaigns encouraging Singaporeans to consume vegan meat for health and ethical reasons.

Explain how the above events will lead to a sharp increase in the price of chicken in Singapore. [10]

- R1: Fall in supply is larger than the fall in demand
- R2: Fall in supply reinforced by a price inelastic demand

SAJC 2023 Q1(b)

Ticket scalpers – who snap up tickets, often in bulk, then resell them for profit on the secondary market – are back in business since large events and international acts resumed after the pandemic. Fans of Blackpink and Coldplay to, most recently, Taylor Swift, have been forced to buy tickets from scalpers as tickets for their concerts were sold out quickly. These are usually sold at a very high markup, with these resellers often citing the "hassle" and "stress of queuing up" as reasons for the price increase.

Discuss possible strategies that concert organisers could use to improve the market outcome for this type of concert for producers and consumers. [15]

- R1: Improved market outcomes for producers (increased revenue): raise price of concert tickets
- R2: Improved market outcomes for consumers (increased consumer surplus): increase SS of tickets through use of a larger venue

TJC 2023 Q1(a)

The 2021 global semiconductor shortage was triggered by increased electronic device purchases during the pandemic and supply disruptions caused by Covid-19 shutdowns. As the manufacturing of semiconductors takes time, there are fears of persistent shortages and surging prices. Encouraging recycling of semiconductor component parts from old electronic devices may help mitigate the shortage by dampening the need for new semiconductors.

Explain why there was a persistent shortage in semiconductors and how this may lead to a surge in their prices. [10]

- R1: Persistent shortage – DD increase, SS decrease + price inelastic supply (price increase is insufficient in clearing shortage)
- R2: Surge in prices – Sharp increase in price due to a price inelastic supply

N2019/II/2(b)

A firm in Singapore is facing an increase in demand for its goods which has led to an increased demand for labour. Its demand for labour is also inelastic. In addition, large numbers of its workers born in the 1960s ("baby-boomers") have been retiring, reducing the number of workers available to the firm.

Discuss whether making changes to the foreign worker levy is likely to be the most effective way the Singapore government can address the labour shortages experienced by such firms. [15]

Foreign worker levy is a tax on the employment of labour → reducing it leads to fall in firm's marginal cost

Aim: Solve labour shortages experienced by firms

1. Reduce demand of local workers
2. Increase supply of local workers

Policy 1: Reduction in foreign worker levy.

- > Reduce the marginal cost of hiring foreign workers for firms. Firms will then switch to hiring more foreign workers to replace local workers.
- > Reduce the demand for local workers

Limitations

1. Displaces local workers which leads to an increase in unemployment and worsen income inequity
2. Increasing reliance on foreign workers

Policy 2: Government subsidies to encourage automation

- > Government to provide subsidies to encourage firms to automate certain labour intensive processes. Machines will thus replace the job of a worker.
- > Reduce the demand for local workers

Limitations

1. Costly. Incur opportunity cost of available government funds when the government spends money to subsidise firms.

Policy 3: Increasing retirement age

- > Government to increase retirement age to support and encourage older workers to continue in the workforce

Limitations

1. Firms may choose not to hire these workers as it may increase their cost due to lower worker's productivity

Evaluation: consider short-term / long-term

N2017/II/2(a)

Falling interest rates, continued income growth and other factors contributed to a period of rapid residential property price inflation in Singapore from the middle of 2009. However, the government has successfully pursued policies to restrict this rise to the extent that residential property prices actually fell in 2014 and 2015.

Use supply and demand analysis to explain why falling interest rates and continued income growth may have led to a rapid rise in residential property prices. [10]

How will $\downarrow i/r$ and continued Y growth \uparrow the DD for residential property?

- \downarrow Interest rate \rightarrow \downarrow cost to borrow to finance property purchases \rightarrow \uparrow DD for property
- Continued income growth \rightarrow more income to pay for property purchases \rightarrow increase upgrading of property and also investment in property \rightarrow \uparrow DD for property

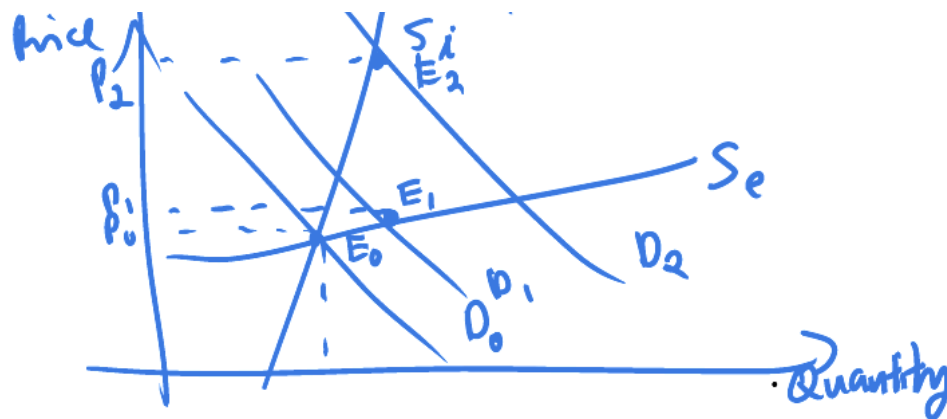
What is the likely YED and PES for residential property?

- YED: depends on the type of property

- Higher end property like Built-to-Order (BTO) larger flats, condominiums and private houses: $YED > 1$ (normal-luxury)
- Middle tier property smaller HDB flats: $0 < YED < 1$ (normal-necessity)
- Low end property like 2 room HDB flats: $YED < 0$ (inferior goods) – not really needed in this question as the focus should be in $YED > 0$ with rising income that will raise demand and thus price.
- 1 room HDB flats are generally for rental and not for purchase.
- PES: all property takes a long time to build so low PES (steep supply curve)

How will YED, PES and the shift in DD result in a rapid rise in residential property prices?

- A more proportionate \uparrow in DD (especially for higher end property) and $PES < 1$ supply curve \rightarrow rapid \uparrow in property prices as compared with a less than proportionate \uparrow in DD and $PES > 1$ supply curve
- Illustrate and explain the diagram below



N2018/II/1(a)

The average price of tickets for two concerts performed by singer-songwriter Ed Sheeran in November 2017 at the Singapore Indoor Stadium was S\$180. Tickets went on sale six months earlier and both concerts sold out almost immediately. Some tickets were later being offered for resale at prices well above their face value.

Using demand and supply curves, explain why there is an excess demand for tickets and why there is a high resale price. [10]

R1: Explain how excess demand comes about

SS of tickets is fixed, based on seating capacity of stadium \rightarrow SS is perfectly price inelastic
 Ed Sheeran is highly popular singer with many die hard fans \rightarrow DD is highly price inelastic

Difficult to set profit-max price

- Incur high total fixed cost (TFC) e.g. rental of venue, audio equipment \rightarrow total variable cost (TVC) e.g. hiring of ushers, making of concert souvenirs is insignificant compared to TFC \rightarrow MC of providing an additional consumer entry is close to zero
- Since profit-max o/p occurs where $MC=MR$, $MC = 0 \rightarrow MR = 0 \rightarrow$ to maximise profit, need to max TR, i.e. all tickets must be sold

- With imperfect information, impossible to accurately estimate the exact demand → to maximise TR by selling off all the tickets, set relatively low price

Price set by concert organisers is below eqm price → quantity demanded exceeds quantity supplied → shortage

R2: Explain how the resale market operates, leading to a high resale price

Shortage prompts csr to turn to the secondary market to purchase tickets

Number of sellers in secondary market is extremely limited and fixed → SS is perfectly price inelastic, but lower than eqm qty traded in primary market

DD price inelastic

⇒ high resale price, much higher than that in primary market

Firms and decisions

Typical part (a) questions

- Explain how level of competition (type of market structure) affect price and output decisions
- Objective of firms: profit-maximisation, profit-satisficing
 - Explain how rational producers make their production decisions

Typical part (b) questions

- Discuss if ____ is the best strategy
 - Consider price, non-price strategies
 - Increase profit by increasing revenue / lowering cost
- Discuss if government intervention can lead to improved outcomes for society

ACJC 2023 Q2(a)

China's 50 electric vehicle (EV) battery manufacturers will be able to produce four times the demand of EV battery in the country and the top 10 manufacturers have a market share of 97 per cent.

Explain how the level of competition in the EV battery industry in China influences firms' price and output decisions. [10]

- Oligopoly market structure
- R1: Low level of competition leads to high price setting ability and low output
- R2: Mutual dependence leads to stable prices and output

ASRJC 2023 Q2(a)

Explain one reason why consumers might be better off and one reason why consumers might be worse off when firms are faced with increasing competition. [10]

- R1: lower prices, more variety, better quality of products
- R2: higher prices (not able to reap iEOS, higher AC), poorer quality/variety (firms reduce quality of goods to reduce cost / less able to R&D)

EJC 2023 Q1(a)

Explain what needs to be considered when a rational firm makes decisions on pricing and non-pricing strategies. [10]

- R1: Benefits of pricing and non-pricing strategies: raise TR / lower TC → profits rise
- R2: Costs of strategies: TR may not rise / TC may not fall → profits may not rise
- R3: Constraints

HCI 2023 Q3(a)

Explain why some firms make subnormal profits when faced with a higher level of competition but remain in the market while others shut down. [10]

- R1: Explain how a firm earns subnormal profits when faced with a higher level of competition
- R2: Explain why these firms remain in the market while others shut down (Explain the shutdown condition in the short run: $AR < AVC$)

MI 2023 Q2(b)

Discuss the extent to which firms faced by high levels of competition are more vulnerable to closure than firms in less competitive industries. [15]

- R1: Firms faced by high levels of competition (PC firm or MPC firm) are more vulnerable to closure in a recession than firms in less competitive industries (Monopoly or Oligopolist).
 - PC/MPC firms make only normal profits in LR due to low BTE → higher tendency to fall into subnormal profits
Monopoly/Oligopoly firms make supernormal profits in LR due to high BTE → any reduction in the price would not necessarily force them into subnormal profit position & even if they do earn subnormal profits, can make use of accumulated profits to help them tide through the tough times.
 - Monopoly/Oligopoly firms previously cost-inefficient due to lack of competition → cut costs to increase profits
PC/MPC firms already productive efficient due to high level of competition → unable to cut costs further
- R2: Firms faced by high levels of competition (PC firm or MPC firm) are less vulnerable to closure in a recession than firms in less competitive industries (Monopoly or Oligopolist).
 - Sunk cost in PC/MPC firms is lower (MPC firms are small and does not use hi-tech capital goods) → lower costs → harder for them to reach the price level where they would need to shut down i.e. $AR(P) < AC$.
- R3: There are other factors that will cause the firm to shut down other than type of market structure.
 - Depends on nature of goods – YED, esp during recession

NJC 2023 Q2(a)

GrabFood (56%), Foodpanda (35%) and Deliveroo (8%) dominate Singapore's online food delivery industry. Commentators observed e-commerce companies Amazon and Shopee potentially have an advantage in entering the online food delivery industry given their access to large customer databases, sophisticated analytics capabilities and e-commerce frameworks in place.

Explain why Singapore's online food delivery industry might be considered to be an oligopoly. [5]

Features of market structure – oligopoly

1. A few dominant firms
2. High barriers to entry

3. Nature of product: differentiated
4. Imperfect knowledge of market conditions

N2015/II/3(a)

'Market dominance is the main factor determining the profitability of firms.'

Explain how market dominance can influence a firm's price and output decisions. [10]

- Define market dominance
- R1: Low market dominance – perfect competition: when there is no market dominance, resultant market structure is PC market where firms are price takers, produce at profit maximising output where $MC=MR$
- R2: High market dominance – monopoly: with market dominance, monopoly able to restrict output below optimal level, charge higher price to increase profits

N2008/II/2(b)

Discuss the extent to which the behaviour of firms depends in reality on the actions of their competitors. [15]

- R1: behaviour of competitors affects pricing and output decisions of a firm
 - Briefly explain characteristics of oligopoly, why oligopolists are mutually interdependent
 - Explain price rigidity → how firms react (increase/decrease price → lose TR)
 - Explain price war → how firms react (firms view as sign of competition, trigger price war → hurt profit level) → adopt non-price strategy to compete
 - E.g. pharmaceutical market, car manufacturing market
- R2: behaviour of competitors may not affect pricing and output decisions of a firm
 - Monopolistic competition: large number of small firms, each has small market share
 - So the actions of one firm do not affect and are not affected by the actions of the other firms in the market, and this means that there is no strategic interdependence.
 - When an MC firm changes its price, it will not have any significant effect on the other firms in the market. The rival firms will hence not react by changing their prices. Therefore, when an MC firm makes pricing and output decisions, it need not take into consideration the reactions of the other firms in the market. In this sense, the pricing and output decisions of an MC firm do not depend on the behaviour of competitors.
 - E.g. F&B industry: if a restaurant reduces the price of its dishes, the reduction in the price will not have any significant effect on other restaurants which will not prompt them to react, so no need to consider the reactions of other restaurants.
- Evaluation
 - Depends on market structure
 - If the market produces essential good e.g. public transport or telecommunications, government regulation is likely to be a major determinant of the pricing and output decisions of the firm or firms. E.g. Singapore government regulates public transport

market through Public Transport Council, the two public transport operators are required to seek approval from the Public Transport Council for any fare increments.

- Government intervention to restrict firms from responding: e.g. antitrust laws to disallow M&A, nationalisation

N2016/II/3(a)

In Australia, small and remote communities face high and stable prices for petrol. The petrol is supplied by one or two small petrol stations owned by small independent retailers. Prices are lower and more volatile in the large cities, where there are a large number of big petrol stations owned by a small number of big oil companies.

Explain why less market competition might lead to higher and more stable prices. [10]

- R1: Higher prices
 - No incentive to keep price low to compete with competitors, gain mkt share, increase profits
 - In a competitive market, numerous sellers compete with each other to attract customers, often leading to lower prices as they try to gain a larger market share.
 - When there are fewer competitors, sellers have more control over pricing, as they face less pressure to lower prices to match or beat their rivals.
- R2: More stable prices
 - No break out of tit-for-tat price war / price competition (rival firms keep price low and bid prices down) as each firm already has large market share, high profits → **price rigidity (explain)**

Market failure

TJC 2023 Q3(b)

Since the outbreak of “monkey pox” (mpox) in May 2022, there have been 88,600 confirmed cases and 152 deaths. However, as compared to the Covid-19 vaccinations which have been made widely available and provided for free by the Singapore government, this is not the case for mpox vaccinations. This is because the risk to the general public remains low with disease transmission predominantly via close physical or prolonged contact.

Discuss the view that the extent of government intervention always depends on the degree of market failure. [15]

- R1: Explain how the extent of government intervention depends on the level of market failure – compare the extent of market failure in the market for vaccinations against Covid-19 vaccinations against monkeypox
- R2: Explain how the extent of government intervention may not always depend on the extent of market failure, but instead on the extent of inequity e.g. market for private education