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LECTURE 1 – DEMAND AND SUPPLY

Exam : 6 essays to choose 3 (jargon).

What is Economics?

The study of the production, distribution, and consumption of wealth in human society. The study of how individuals and groups make decisions with limited resources as to best satisfy their wants, needs, and desires.

Applying theoretical concepts to practical situations. Because of scarcity of resources we do not have enough money. There is a finite amount of resources. Sooner or later these resources will run out.

As rational human beings we tend to express *infinite needs*. There is no limit to how much we would like to consume. The dilemma is on one hand to express unlimited demand and on the other hand we are faced with the issue of scarcity so there's a limit to how much we can consume. The production of the world cannot satisfy the demand of its 7 billion inhabitants.

Scarcity - the excess of human wants over what can actually be produced.

Demand and supply are the most fundamental things to economics.

An economy is made up of **consumers** and **producers**. They make up the economic system, there's no need for a government.

There were a group of people and decided how many production had to be produced. This system worked.

After the Second World War, **Russia** was the biggest economic power in the world, even better than the US. During the early decade of communism, it worked wonders. In the end, the whole system was so complex that it collapsed. So inefficient that in 1989 the Soviet Republic decided it was over.

On the other extreme we have the market system. Everything decided by the market forces (a system whereby those who produce and those who consume meet, agree on a price, and a transaction occurs). The market per se at times may fail to deliver. We can have **Market Failure**.

For a market to function we need consumers and producers. Consumers have to buy and pay. You cannot exclude people from consuming a service but we also have the problem of **Free-Riding**. Ultimately, at the end of the day, everyone will decide not to pay. If direct payment is not mandatory, people will for sure free-ride. The only way of addressing this problem is by having the government itself delivering such services. Taxation. Certain services which cannot be excludable, tend to fail in a market system. That is why we need the government who collects taxes and finance these services.

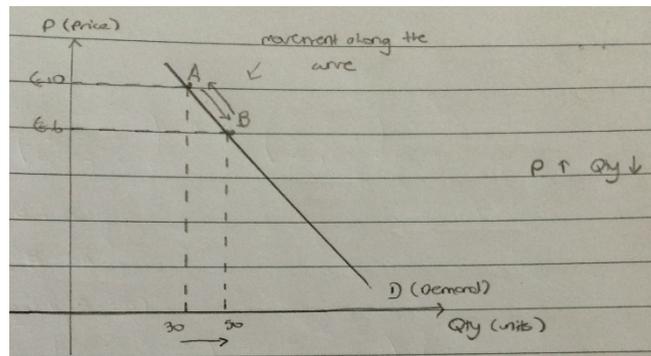
The middle way is a mixed economy between the government and a market system.

Public Goods - anything that the market will fail to deliver.

In addition to public goods we also have **merit goods**. Governments are of the opinion that their respective residents should be provided with **basic services** such as health and education. Those kind of goods and services that the government thinks that are essential for the population to enjoy and therefore provided by the public sector but there is still room for the private sector to deliver such services.

The Demand Curve

If prices go down we consume more and v.v. A negative relationship between the price and the quantity (indirectly proportional). We consume things because of **utility and satisfaction**. If the price of something goes up, we are not willing to buy it because after an increase in price our satisfaction is lower relative to the one before. Given that our happiness is influenced by the number of units that we consume, if we consume in less units, we are going to be less happy (we are rational human beings who try to safeguard our satisfaction).



People tend to measure richness, not by how much money you have in your bank account but by the amount of goods and services you are consuming.

Trying to mitigate this problem (explain why the demand curve is downward sloping):

- The Income Effect - consume less and feel poorer.
- The Substitution Effect - whenever the price of a good goes up, we try to find a substitute to restore our level of satisfaction.
- Our willingness to pay is influenced a lot by the utility we have to consume something. The initial stages of consumption, will give us a high utility. The more we consume, we have less utility and therefore the less we are willing to pay. When we have too much of something, we are less willing to pay. When you start to consume something that is scarce, you are willing to pay a lot for it.

Whenever we move from one point to another and we stay on the same curve D, we say that we have moved along the curve. Any change in price will lead to a **movement along the curve**.

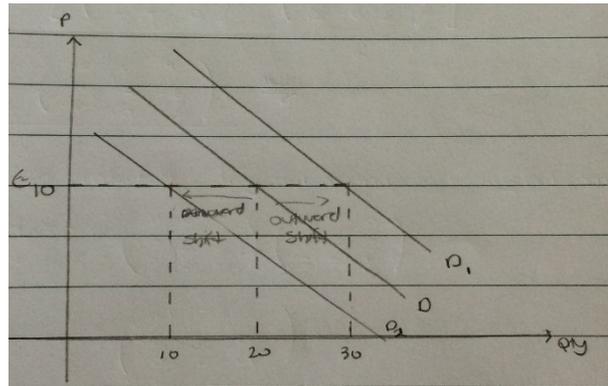
The **demand** for a particular good or service is not only influenced by a change in price, but also influenced by non-price determinants. There are other factors that go beyond the change in price. These lead to shifts.

In **2003**, people in the US engaged in a property binge (took out loans and purchased estates). In **2008**, someone realised that all this was a **big inflated bubble** and the demand for real estate went down. People were caught up with land and owing more than they owned

(valuation was low). **Everyone selling at once.** Automatically people started to reduce their consumption to accumulate once more their wealth. This mass wipe out of wealth has knocked down demand and people are consuming less (both on a micro and a macro level).

Factors that lead to shifts :

- Income - **more income** implies that we are willing to consume more at the same price.
- Wealth - the **stock of assets** that a person owns (money, property). The **accumulation of income.**
- Taste - if something runs **out of fashion**, people will **demand less of it.**
- Price of complementary (if the price of diesel goes down, people will consume more diesel engines) and substitute (if the price of butter goes up, people will consume less in favour of margarine) goods.

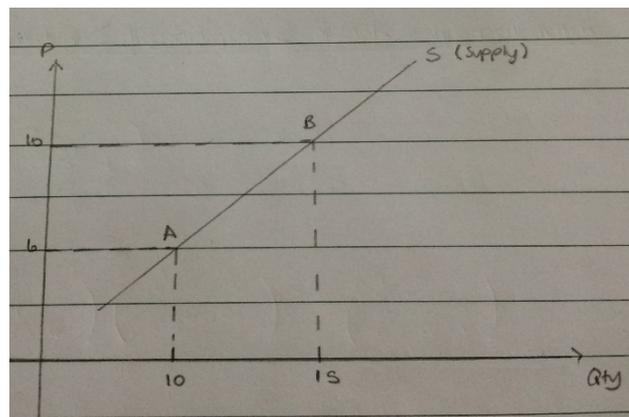


The Supply Curve

The higher the price, the higher the quantity (the supply curve is upward sloping). Perspective of suppliers.

Reasons for an upward slope :

- The **higher the price, the more we are willing to produce.** It is highly likely that we will realise more profits.
- The **more we produce, the more likely it is that our cost of production goes up.** The selling price has to be higher to make up for this cost of production.
- Whenever there is a **lucrative business**, the more suppliers would like to join in. The higher the price, the more suppliers would be tempted to join into the market to get their fair share.



- A change in price will lead to a movement along the curve. Ceteris Paribus (all other things being equal) except for the change in price. If there is a change that is brought about by a non-price determinant, then we will have either a shift outward(right) or a shift inward(left).

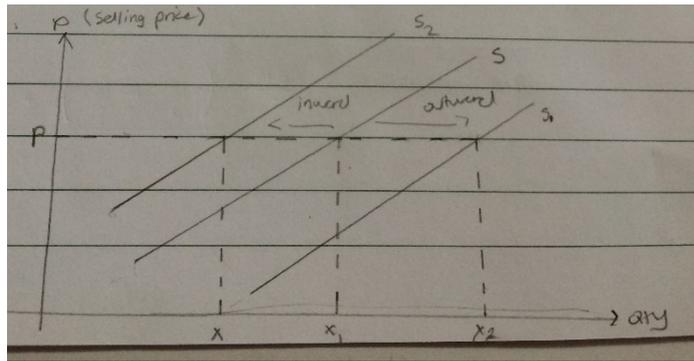
Positive changes will lead to an outward shift and v.v.

Positive Changes :

- Technology - drives down prices of goods and can lead to a substantial improvement in quality. Computers : we can still consume the same as before but the price is much lower than in the past. A shift outwards will bring about a lower price and more units of output.
- Government policies - subsidies (solar water heaters). Reducing the price and producers are encouraged to supply more at a lower price (the difference in price is paid by the government).
- Increase in suppliers - competition is healthy. Suppliers will supply more and act as a drag on prices.

Negative Changes :

- Increase in price of raw materials - it is less profitable for the supplier to supply that good. If national insurance (social security contributions - *bolla*) has to go up, entrepreneurs will scale down their production because it's more expensive to produce.
- Government imposes attacks - when the eco contribution was introduced on plastic bags (supplier had to pay a tax) and the supplier had to pass that on the consumer and therefore the supply of plastic bags shifted inwards considerably. Taxes on production.
- Random shocks - an earthquake. There is a disaster and suppliers can simply produce less at each price level.



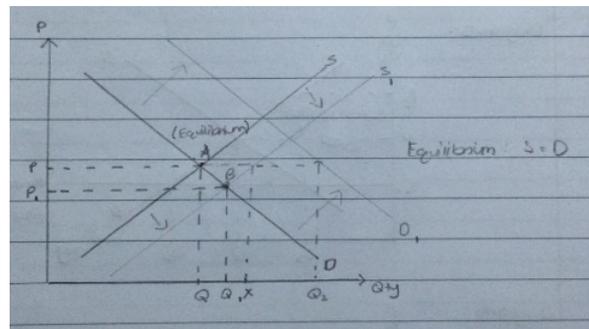
LECTURE 2 – THE MARKET

Movement along the curve - change in price.

Shifts of the curve - a result of non-price determinants (fashion, weather, population, income, wealth, technology and cost of production).

Improvement in technology (computers) - supply curve will shift outwards.

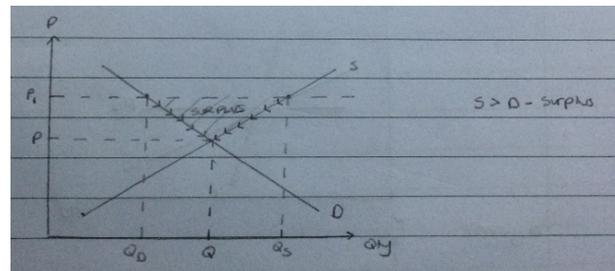
Market Equilibrium - the point where supply and demand intersect. The point where $S=D$. If the **supply curve shifts outwards**, at each and every price level, we're going to have **more output (X)**.



Increase in disposable income - demand curve shifts outwards. A shift in the **demand curve** will bring about **higher prices**. People have more income and since producers will notice that the customers are more willing to consume, they will increase the price level and absorb that income in terms of profits.

In practical terms, the market is always in a **Disequilibrium State**.

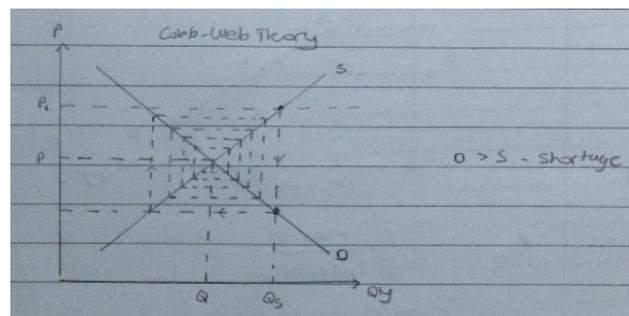
The market price P_1 is higher than the equilibrium price P . Because the price is higher than it is supposed to be, we observe that the demand is inferior to the equilibrium and supply exceeds the equilibrium supply. We have a situation of a **Surplus** (supply exceeds demand). The surplus will be eliminated **through movement along the curves** (price level will go down until that surplus is exhausted).



Cobb-Web Theory - how the price mechanism solves the issue of surplus. A continuous change in price will move to the equilibrium and the market clears out (from a surplus we move into an equilibrium position).

Retail - sales (a reduction in price).

We have to reduce the price until we find a demand for that price, even below the market equilibrium. Now the price is inferior to the equilibrium price (as oppose to



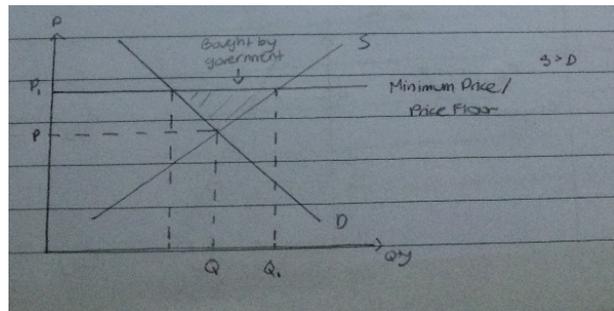
before) and therefore we have a **Shortage** (demand exceeds supply). The market is still in a disequilibrium states.

Producers will sell what they are producing at a higher price. Now there is another surplus but it is lower relative to the one before. The market has to adjust once again. This price mechanism process keeps on going until finally the market clears out (that can be a question of months and also a question of a market which will never equilibrate). It is very dynamic. Prices are continuously going up and down and those movements are influenced by the disequilibria that we have in the market.

Agriculture - the price changes from one week to another because it depends on the harvest.

How does **Government Intervention** (price controls) stop all this from happening?

Minimum Price / Price Floor - something that the government decides via legislation. In order to achieve a certain price, the government has to legislate it. The law will stipulate that the price charged for this particular good/service cannot be below the level of P_1 (minimum price). The price cannot go below this level (there is a floor below which you cannot go).



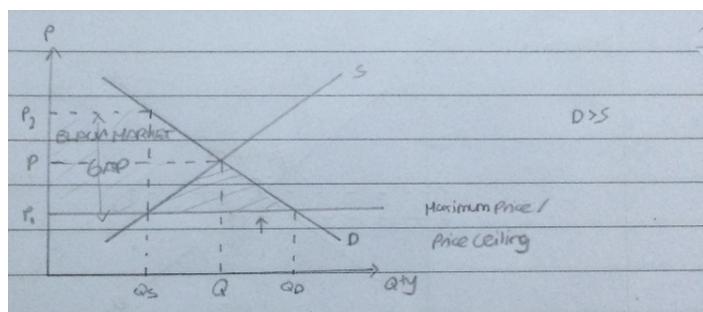
Why? Common Agricultural Policy - farmers (3%) receive 40 % of the resources of the budget (they are very powerful). If we had to leave everything up to the market, the farmers would only get P for their agricultural produce and they sell Q. With the help of minimum price, they not only manage to secure a higher price, but because they are being paid a higher price, they are encouraged to produce even more. Whatever the price, they will manage to sell.

Consumers don't only have to pay more, but will also have to pay more through tax since the government has to buy all the surplus (either destroyed or given as aid to African countries).

Prime motive and aim is to protect the interest of farmers and secure the supply of food.

They do this at the detriment of consumers (paying a high price and consuming less than we would consume if the price was lower).

Maximum Price / Price Ceiling - the price charged cannot be higher than P_1 . There's a limit to how much producers can charge, by means of law. Whereas before we had a surplus, now we have a shortage, meaning that demand now is greater than supply.



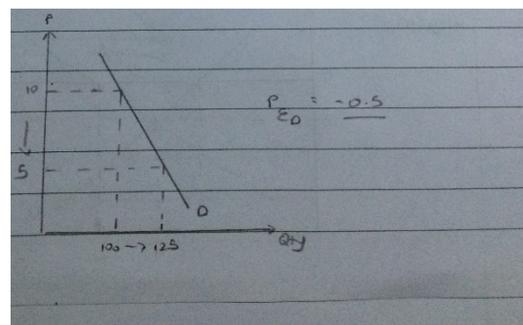
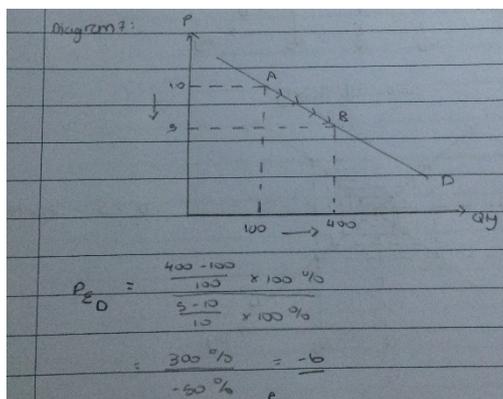
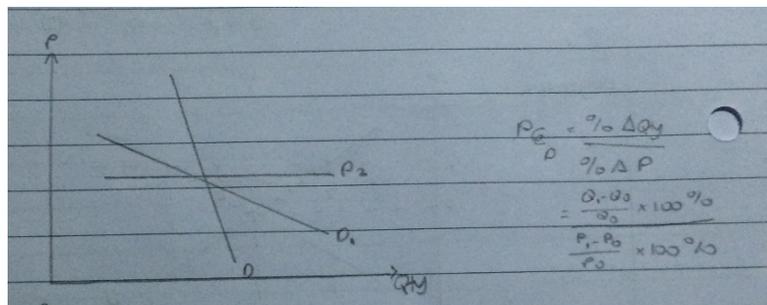
Why?

- Price ceilings are more common during desperate times. **During the war food is in short supply.** If the government would leave the market on its own, the prices would go high and people won't be able to consume it. Therefore, during these times, the government legislates that food cannot be sold higher than P_1 . How are we going to deal with the shortage? Through rationing (victory kitchens). In that way, the quantity

supplied is divided in equal parts between those who are eligible to consume. People don't get as much as they would like but only get a portion.

- Property Rent - after the war, Malta was practically flat. People had to live somewhere. Landlords were renting out property at high prices to those who were willing to pay (instability). In 1948, government decided to regulate property rent through price ceilings. These remained with us for 50 years (until 1995). Nowadays rent is completely based on market principles. If the price ceiling is not revised, it can lead to unintended consequences (**we've managed to build half of our island**).
- **Unintended consequence** - the black market. Whenever something is in short supply, those who have the resources will try to go round the system even if it is illegal and try to bribe the producers by paying a premium so that they can consume more. In the case of a price ceiling, at Q_s , there is a demand further up, for the same quantity but who are willing to pay at P_2 . That gap is the premium that consumers are willing to pay to consume goods/services via the black market.

Price Elasticity of Demand - the responsiveness of quantity with respect to a change in price. How much quantity will change if there is a change in price. The responsiveness of quantity with respect to change in price is noted in D , D_1 and D_2 .



Comparing 1st to 2nd answer (-6 and -0.5) - the interpretation is that for every 1% change in price level, in the first case demand will change by 6 times and in the other scenario demand will change by 0.5 times. The responsiveness of demand by a change in price. The steepness of the curve depends on these numbers. The first curve is less steep relative to the second one. ***The steeper the curve, the less the price elasticity of demand.*** The first curve is **Elastic**. The second curve is **Inelastic**.

The minus sign doesn't mean anything. It simply shows us that we're dealing with demand (there's a negative relationship with price and quantity and therefore we're bound to have a

minus). The sign prior the number only tells us whether we're dealing with a supply or a demand curve.

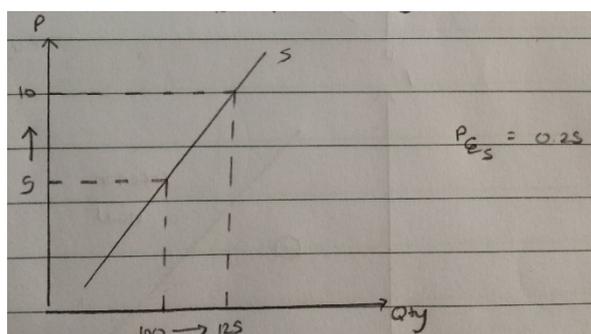
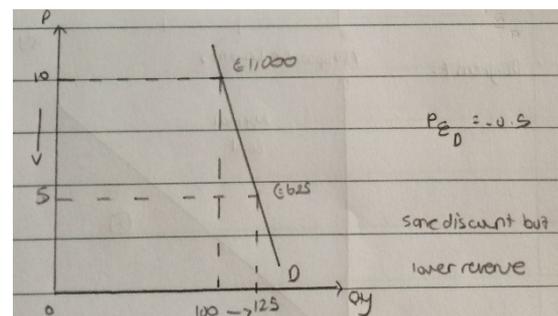
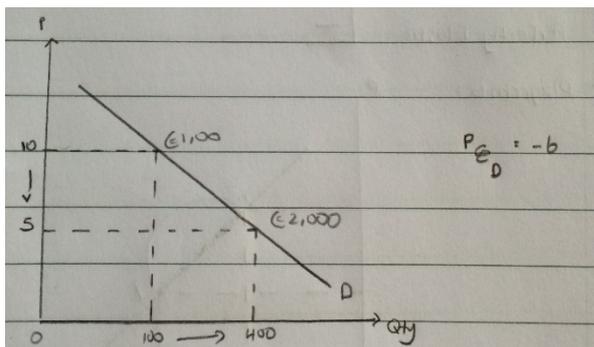
LECTURE 3 – ELASTICITY OF SUPPLY AND DEMAND

The main aim of having a price floor is to guarantee a minimum income to the suppliers.
Unintended consequence - we are going to have a surplus.

The main aim of price ceilings is to protect the consumers. Shortage of food and housing.

Price mechanism - continuous movement in the price given that there is a disequilibrium in the market (either a surplus or a shortage).

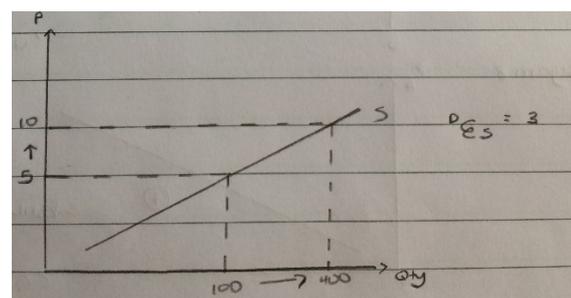
Price Elasticity - what is the effect on quantity when there is a change in price. Steepness - explains the responsiveness.



The sign before the value of elasticity of demand is always negative, representing the fact that we're dealing with demand, where the price and quantity are negatively related.

We have a positive relationship between the price and quantity in a supply curve therefore

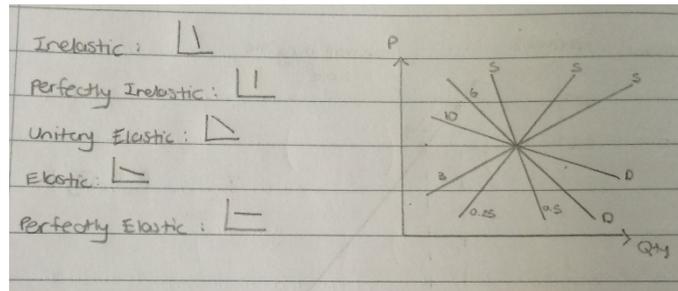
there is always a positive sign before the value of elasticity of supply.



- $0 < \epsilon < 1$ - Inelastic

- $\epsilon = 0$ - Perfectly Inelastic - irrespective of the price, we will consume exactly the same amount.

- $\epsilon = 1$ - Unitary Elastic - if price goes down by 10%, the quantity will go down or up by the same extent.



- $1 < \epsilon < \infty$ - Elastic.

- $\epsilon = \infty$ - Perfectly elastic - we're going to consume an infinite range but we're going to do so only at a particular price.

The higher the elasticity, the flatter is the curve. If the number tends to infinity it will be perfectly horizontal.

If we're going to **discount** our prices to sell more, we need to **know by how much**. We have to be sure that what we're going to do is going to work. If the **demand is inelastic**, it's not **profitable to reduce your prices**. It does not make sense to offer a discount because if we reduce the price by a substantial amount, we still won't manage to increase sales and revenues will decline. It makes sense to play around with the colour, size etc. rather than modify the price.

If the demand is **elastic and we offer a small discount**, that discount will **trigger a substantial amount in our revenues**. It makes **sense to play around** with the price and leave everything else constant.

Government - example cigarettes (inelastic). If the prices increase, quantity will go down minimally but the total tax will increase. Demand is so inelastic that the increase in tax will by far outlay the decrease in quantity. Despite the increase, people will just reduce their consumption by a minimal amount. It makes sense to tax things that are inelastic. When there was the introduction of **eco-contribution** on plastic bags, there was just a minimal price of **€0.05 and the demand went down from about 40,000** to a few hundreds. Therefore demand for plastic bags is elastic.

When we have the case of an **inelastic good**, the price will go down substantially, the quantity will go up in a minimal way (negligibly), but total expenditure will still go down. The reduction in price won't compensate with the change in quantity. When we have the case of an elastic good, the price will go down substantially and so will the quantity, and the total expenditure will go up.

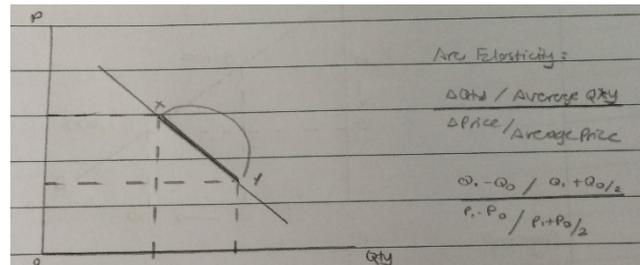
Determinants of Elasticity :

- The more **Substitutes** and the closer they are to the good and the service in question. Prices of petrol and diesel. The more substitutes we have, the more responsive it is to the price.
- The **Share of Expenditure** that we allocate to such good. Newspaper - if the price had to go up by cents, you won't bother since it's still in the region of €2.00. The higher the share the more elastic the demand for it, will be.

- **Time** - it is only over time that consumers change their behaviour, so if the price of something goes up today, people will take a while before they respond. People don't react immediately. Same thing applies for supply. Oil - recently it hit the lowest price in 3 years. Both demand and supply take a while to respond to change in price. The more time there is, the more responsive the quantity tends to be.
- **Share of costs with respect to total cost** - if the price goes up, producers will be willing to supply less because the cost of supply will increase substantially.

What we have done so far is referred to as **Point Elasticity** (the responsiveness from a point X to another point Y).

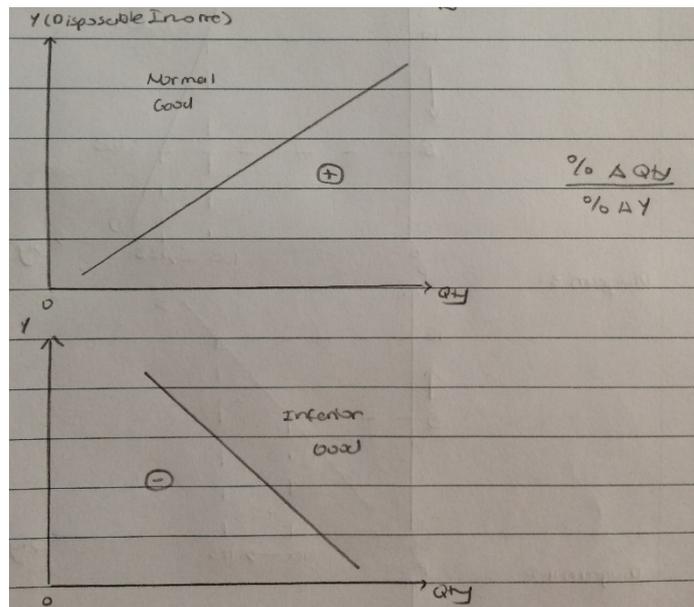
Arc Elasticity (very similar to the Point) - we tend to measure the elasticity along the 2 points. Measuring the responsiveness along the curve between the 2 points, not from one point to the other.



Income Elasticity of Demand

Income Elasticity of Demand - dealing with the responsiveness of quantity to a change in income.

Normal Good - most of the goods that we consume. If we have more income we tend to consume more. Example eating out. If our income goes up, we can go eat out every week. A **positive** relationship between your income and quantity.



Inferior Good - public transport. It is expensive to use your own car. If you have low income, money-wise it is more worth it to use public transport. If you earn more income, you're going to consume less public transport because you can afford your own car. **Negative** relationship between your income and quantity.

The elasticity tells us our responsiveness to a change in income.

Eating out is elastic to a change in income. A normal good will still be elastic, the only differences act on the steepness.

Luxury goods (sports car, property) are very income elastic. If your income increases, you will demand more.

Determinants of Income Elasticity of Demand:

- **Satisfaction** - we consume to satisfy our utility, so if to satisfy ourselves we have to consume a lot, it means that every change in income will completely translate into

consumption (highly elastic). If we satisfy ourselves with small amounts of consumption, if income goes up we're going to consume only a part of it because we satisfy ourselves immediately (elasticity won't be high). The more goods we need to satisfy ourselves, the higher the elasticity will be.

- **Rich / Poor** - someone who is on social benefits (income of 7,000). If that person starts to work (12,000), given that there is some kind of lack of material, that percentage change in income is going to bring about a much higher change in quantity consumed. The rich person is perhaps satisfied with what he is consuming. An extra 100,000 won't make a difference in their consumption level. The poor person is more responsive to a change in income rather than the rich person.
- **High Income Elasticity is important for the economy** - if we have high elasticity, the moment that wages go up, people will consume a lot and therefore a lot of economic growth. If income elasticity is low, even though wages will go up, consumers will only consume a negligible amount and that won't trigger the economic growth. The more people consume, the more economic growth there will be.

Cross-Price Elasticity

The price of A mapped with the quantity of B. Superimposing 2 diagrams.

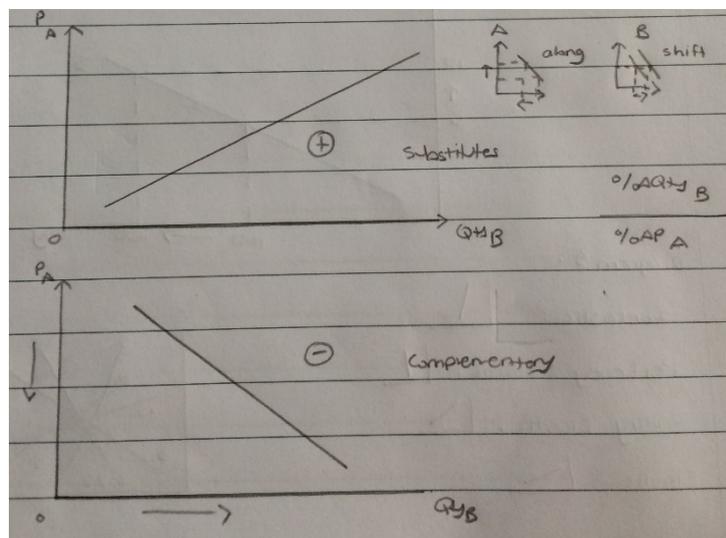
Substitutes - when the price of A goes up, the quantity of B goes up as well. When the price of something goes up and we end up consuming more of the other. Shifting our consumption from A to B. If the answer is just 0.25, it means that they are substitutes but not so close in terms of quality.

Complimentary Goods - petrol and diesel. If out of a sudden the price of diesel had to fall, we would expect people to consume more diesel engines than petrol diesel. If the price of diesel had to go up, then we would expect a decline in the consumption of diesel engines.

Whenever we observe complementarity, we notice that we have a negative relationship. If the value that we get is very high, it

means that the 2 goods actually really go hand in hand. Happens even in terms of shares. If the price of iron shares goes up, it's highly likely that the price of cars share prices go down.

If we get a positive sign, then of course it means they are substitutes, if we have a negative sign, it means that they are complimentary goods.

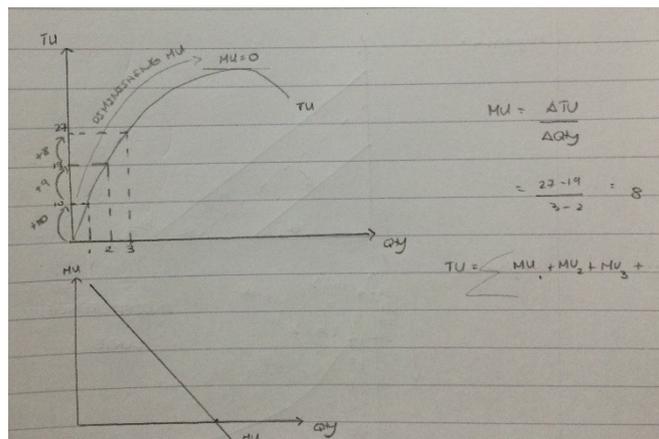


LECTURE 4 - THEORY OF DEMAND

We consume because from consumption we derive happiness and satisfaction. Therefore, we consume goods and services because we want to be happy (a rational person would try to maximise his/her happiness/utility).

TU (Total Utility) - the total satisfaction that we derive from consuming a particular good. As if I am mapping out the total happiness that I am deriving from the consumption of a particular good.

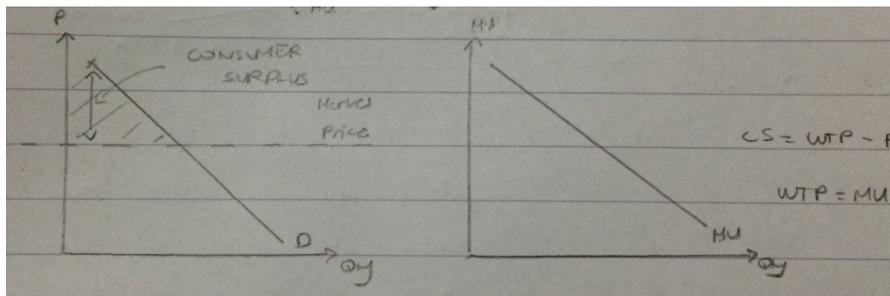
There is an increase in total utility, then it stalls and after a while it starts to decline. Utility is increasing at a decreasing rate - it is increasing but the increment each time round with the consumption of more goods, is going down.



$$\text{Marginal Utility} = \frac{\Delta TU}{\Delta Qty}$$

Marginal Utility is the additional utility that we derive from the consumption of an extra unit of good/service. Example: chocolate. When we consume the second bar we are satisfied but not as much as the first bar. That happiness starts to slowly decline. Therefore, the first conclusion is that marginal utility declines with the increase in consumption. The total utility is made up of the summation of marginal utilities.

Diminishing Marginal Utility - the decrease in happiness. Because of this, the fact that total utility increases at a decreasing rate makes sense. Marginal utility diminishes because the more we consume of something, the less satisfied we are with the additional unit. It keeps on going down and it is also possible that we experience **Disutility** - what we're consuming is making us sick.



Linking marginal utility with the demand curve.

We can observe the similarity between the 2 graphs. They are both dealing with quantity on the x-axis but one has price and the other has marginal utility on the y-axis.

Marginal Utility reflects the price that we are willing to pay. When you see something, there's first the desire to buy it. Without knowing, we transform that desire into money. In order to be satisfied, how much are we willing to pay? I am valuing my happiness to the equivalent of money.

Consumer Surplus is equal to the willingness to pay, minus the actual price, where the willingness to pay is equal to our marginal utility. Our over enjoyment (we were willing to pay 30, but the price is 20). We are over satisfied.

When we say that something is **expensive**, implicitly we are saying that the price is higher than marginal utility. $P > MU$ - what we are paying actually exceeds the satisfaction that we are going to derive. It won't be rational to buy that good.

We ask for a discount to try to minimise the gap between the satisfaction that we think we're going to get and the actual price.

In a way, the price that we're willing to pay reflects marginal utility. Given that the more we consume the less satisfied we are, the less we are willing to pay. That is why there is this negative relationship between price and quantity, and between marginal utility and quantity.

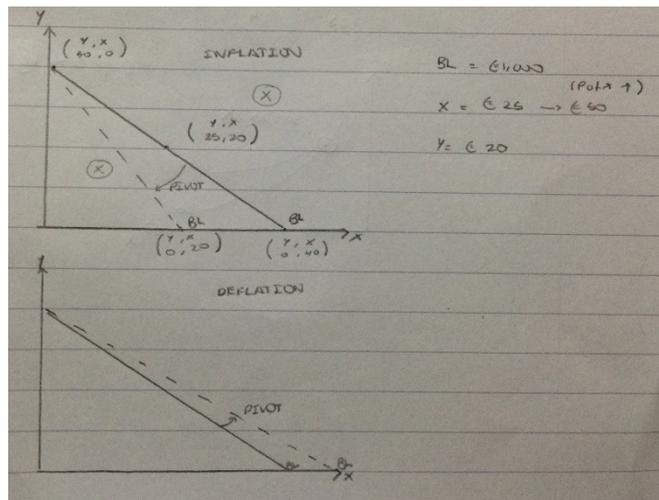
We stop consuming at the point where marginal utility is equal to the price. At that point, consumer surplus is zero (exhausted).

We always transform happiness into money. We always want to earn more because subconsciously we tend to associate consumption with money.

BL (Budget Line) - represents the resources that we have at our disposal that we can spend on either Y or X (2 goods). The budget line is telling us that at one extreme, we can buy 50 of Y and 0 of X. At the other extreme, we can buy 0 of Y and 40 of X. Basically, the budget line gives us an indication of how many units of Y and X we can consume given the limited resources that we have. Any other bundle that lies along the line is another possible combination. Anything outside our budget line is beyond our means.

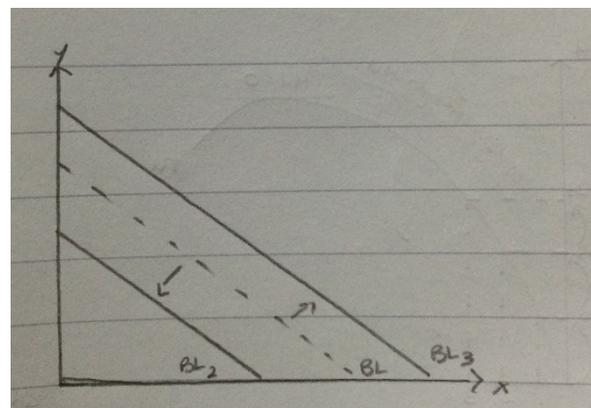
The Budget Line is not something static and can therefore change. Some characteristics that change the budget line:

- Inflation** - an increase in the price level of a particular good. If the price of X goes up, assuming that the budget is fixed and remains as is, what happens is that we're going to consume less of X. If the price of X doubles, the budget line will pivot inwards and now we're able to consume only 20 units of X. Price doubles, therefore we can only consume half of the quantity we used to consume before. The price of Y stays the same, therefore we can still consume the same units of Y.
- Deflation** - prices in Japan started going down instead of going up. When prices go down, it means that the economy is going to experience a lot of trouble. If consumers notice that prices are going down, everyone will start to postpone their consumption decision. Consumption will start to go down, given that there is less demand, unemployment goes up and people will continue to postpone their consumption. It is a vicious circle. Deflation increases the purchasing power of consumer.



The Budget Line, BL can shift inwards to BL2 when we either experience **General Inflation** (both the price of X and Y go up - therefore we're able to buy less of both X and Y assuming that our income remains the same) or **Less Disposable Income** (can be the result of higher taxation, pay cut)

The Budget Line BL can shift outwards to BL3 when we either experience **General Deflation** or **More Disposable Income** (a promotion, an increase in wage).



Indifference Curves - Dealing with quantities and referring implicitly to utility once again.

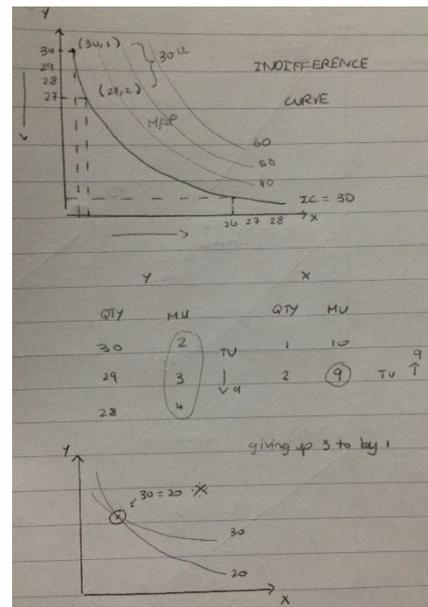
We have quantities on both the Y and the X axis.

The Indifference Curve represents a constant utility/satisfaction of 30 Utils. The curve itself is telling us that irrespective of which bundle we consume, that bundle will translate into 30 Utils satisfaction which is equivalent to 30 Utils).

The Indifference Curve always slopes downwards the right, meaning that it always assumes a convex shape. The reason is because of Diminishing Marginal Utility. The curve represents a trade-off, meaning when we move along the curve, we are giving up some of Y in order to get more of X. Irrespective of the change in bundle, we are still going to get 30 Utils. When we are consuming too much of something, we are going to get less satisfaction out of it in terms of marginal utility. When we have too much of something, the satisfaction that we get from any additional unit is low. When something is scarce, we tend to give high value and satisfaction to that. When you have a lot of consumption, you can give up a bit of it in order to get something of another sort. The loss that we experience from Y is compensated by consuming X. This explains the convexity of the curve.

Indifference Map (more than one indifference curve). Indifference Curves to the right always represent higher utility. These indifference curves represent higher levels of utility.

Indifference curves cannot intersect. Each curve is unique in terms of utility. We cannot say that one curve is equal to the other at a point if we're implying that one has a utility of 20 and the other has a utility of 30. They must be always parallel to each other.



(a)

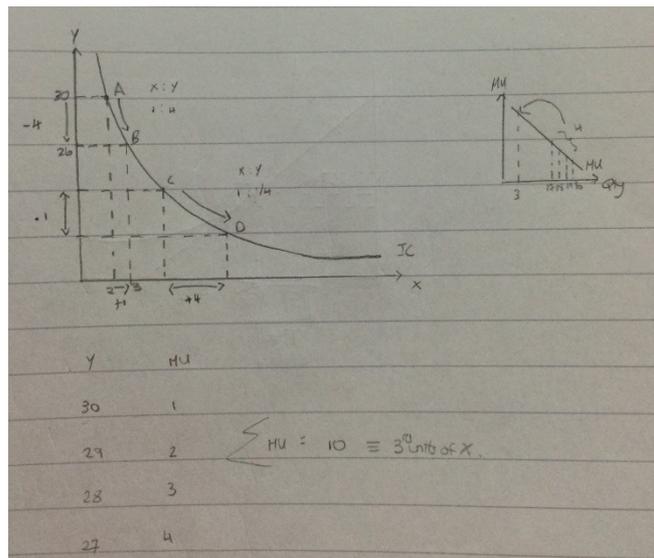
to

LECTURE 5 - INDIFFERENCE CURVES AND BUDGET LINES

The Indifference Curve represents the total utility that we derive by consuming different bundles of Y and X. Irrespective of the bundle that we choose, each and every time as long as we are on the indifference curve, we get the same total satisfaction. Total Utility is constant on an Indifference Curve.

The convexity of the Indifference Curve is attributed to Diminishing Marginal Utility (DMU). This law is about the fact that the more we consume of something the less satisfaction we derive from that particular consumption. More consumption - less utility (diminishing). The extra satisfaction that we derive from buying an additional good, declines with the more goods that we consume.

Bundle A and bundle B give us the same utility given that they are on the same indifference curve. How can you justify that I am willing to give up 4 units of Y and manage to retain the same level of happiness just by gaining an additional unit of X?



When we are at the initial stages of consumption, marginal utility is very high. When we have consumed a significant amount, marginal utility is low. The less we have of something, the more we tend to appreciate it.

At high levels of consumption the marginal utility that we are getting for the 30th, 29th, 28th and 27th good is low. However the marginal utility of the 3rd good is much higher and will compensate for those 4 units of Y.

The law of DMU is reversed, depends on which point on the curve we are.

Marginal Rate Of Substitution (MRS) - The amount of a good that a consumer is willing to give up for another good, as long as the new good is equally satisfying. The

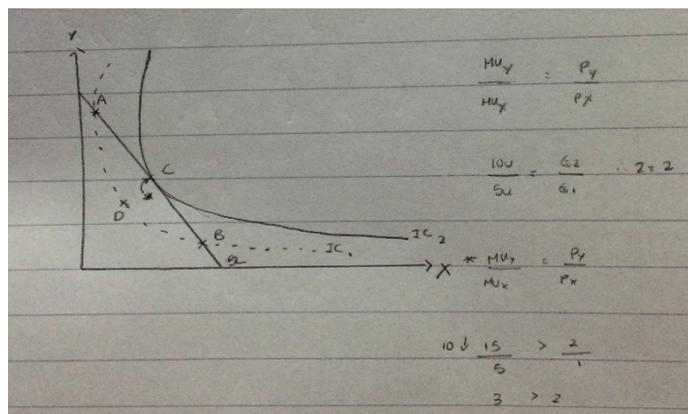
marginal rate of substitution is always changing for a given point on the curve, and mathematically represents the slope of the curve at that point.

Merging the availability of resources together with the level of satisfaction (total utility). If we would like to consume at A, it is a point which is affordable. However, in terms of utility (IC1), that bundle is no longer available.

Point A - we're making full utilisation of our resources but other combinations can give us much more utility.

Point D - if we had to consume it, we have some savings.

A, B and D are all on the same curve so we are going to achieve the same level of utility, but if we had to opt for D, it is cheaper.



A, B and C are the same in terms of expenditure, but given that C is on a higher Indifference Curve IC2, this gives us a higher utility relative to IC1. If we had to choose A or B, we would not be rational. Why should we spend the same amount of resources and get a level of utility which is inferior to something which can be achieved?

Consumers always try to maximise their happiness (rational human beings) by trying to get the highest satisfaction with the lowest possible cost. Therefore **C** is our optimisation - we're getting a higher level of satisfaction with respect to A and B, with the same level of expenditure.

Why is it that C is the obvious answer? It's because of the **Equi-Marginal Principle**. In a simple put way, it is the point where the curve is at a tangent with the Budget Line. The lowest point of the curve is touching with the Budget Line. In mathematical terms, the Equi-Marginal Principle is explained as :

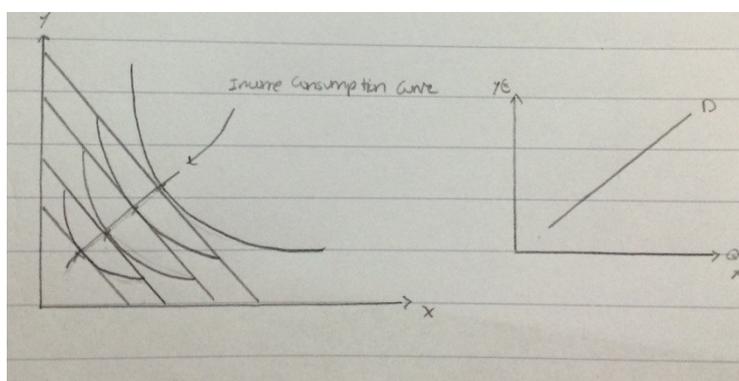
$$\frac{MU_y}{MU_x} = \frac{P_y}{P_x}$$

This means that when the ratio of the utilities is equal to the ratio of the prices, then that is the point where we optimise our consumption (when the 2 gradients are equal). Both the gradient of the indifference curve and the gradient of the budget line are the same. The lowest point of the indifference curve is touching with the budget line.

If the ratio of marginal utility is higher than the ratio of prices. The only way to reduce the ratio of utility is by consuming more of Y (since we already have a substantial amount and consuming another unit will reduce our utility of Y). By consuming more of Y, I will reach the point C which is the optimised one.

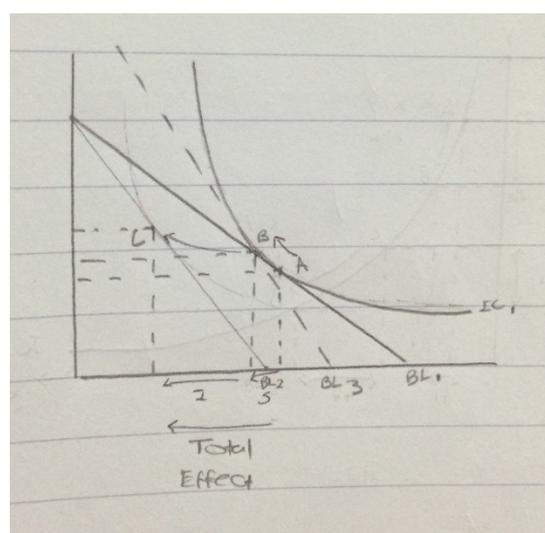
Each one of the Indifference Curves is financed by a higher budget.

The **Income Consumption Curve** tells us how much we're consuming of Y and X with a higher income. We can interpret this curve as our Demand Curve. The more income we have, the more units of X that we will consume. More income is leading to higher satisfaction because we are consuming more units of X. The 2 diagrams are referring to the same thing.



Income substitution effect indifference curve (example of normal good)

Categorising the total change in terms of income and substitution effect. When the price goes up, we consume less because of the substitution effect. Given that we try to safe guard our utility and we have a fixed amount of income, we give up that good that costs more and try to substitute it with something else. At the same time, we have less purchasing power because of the increasing prices. Therefore because of the income effect, we tend to feel poorer. With the help of budget lines and indifference curves, we're going to have a look at the income and substitution effect.



Dealing with an increase in price for a normal good, with respect to quantity X.

Budget Line BL3 is completely based on the assumption that we're going to get more resources. If we get more resources, there is the substitution effect. If that

assumption is knocked off, along with the substitution effect we have to also consider the income effect.

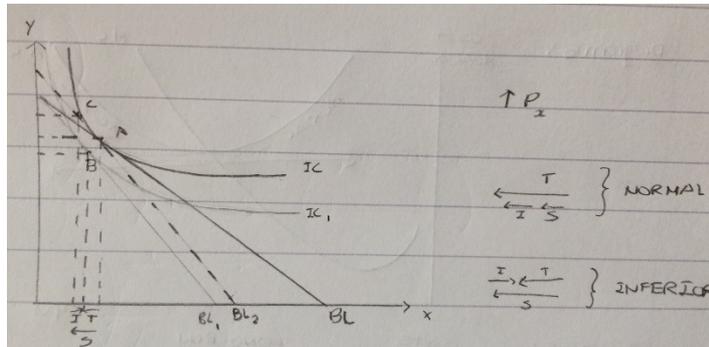
- Price of X goes up: BL1 → BL2 (pivot).
- Now we have a new IC satisfying BL2 meeting IC2 at point C.
- Assuming that there's a rise in income, BL2 → BL3 (shift). Compensating for the loss of purchasing power.
- Now BL3 cuts IC1 at point B and we don't experience a change in utility.
- Although we are on the same IC, we are still consuming a different bundle since the price of X is higher (substitution effect).
- However, the assumption is not real and will rarely take place. Therefore, we have to take this into consideration and move back from point B to C (income effect).

LECTURE 6 - THE THEORY OF COSTS

Inferior Good - we tend to consume more of it when we have less resources (public transport).

Income substitution effect indifference curve (example of inferior good)

In order to map out the substitution effect, we still have to refer to the original indifference curve IC. The only problem is that with our new budget line, we cannot afford to do so, therefore we are going to assume that somehow from somewhere, we're going to get additional resources. The new budget line (BL1) which represents the new price ratio, will shift outwards until we have a new tangent (our budget line is touching with the original indifference curve IC). Thanks to this fictitious budget line (BL3) we are in a position to map out the substitution effect. The movement from A towards C represents our substitution effect.



The Substitution Effect is greater than the Total Effect, so the Income Effect is positive. The total effect is less negative relative to that of the normal good. A small difference from the normal good where our total effect was negative, and part of it was the substitution and the other was the income effect. This is because in the case of the inferior good, part of the substitution effect is off-set by the income effect. When we feel poorer, we're still going to consume less but not as much as if it was a normal good.

If we have a given good, (special type of inferior good: bread and meat during the war - the price of both goes up but we give up meat to have bread given that bread is the cheapest option), we're going to consume more. There is a negative substitution effect and it is ultimately off-set by the income effect.

The Theory of Costs/Production (Theory of Supply)

Costs:

- Fixed - those type of costs that are not influenced by the level of production. Whether we produce 100 or 1,000, we're still liable to pay the same amount of costs. Not influenced by the level of output:
 - Rent.

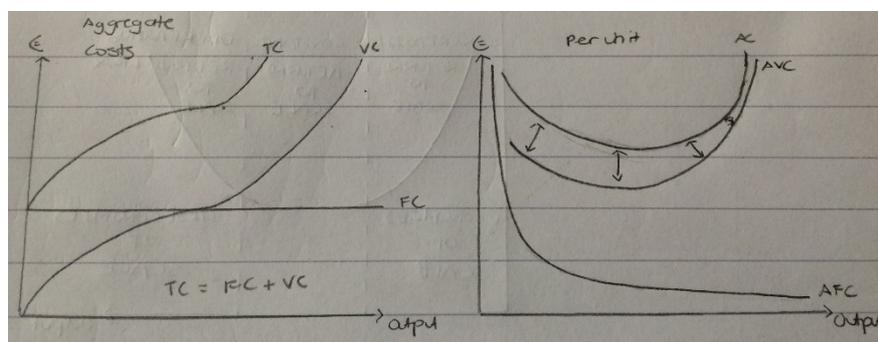
- Royalties.
- Advertising.
- Variable - the cost varies with the level of production. The more units we produce, the more costs we are likely to incur:
 - Wages.
 - Raw materials.

The nature of costs changes with the time period. A crucial element that we're going to deal with is the **Time Period**. We deal with 2 timespans:

- Short-run - that period which is less than a year (from 1 day to 12 months).
- Long-run - that period which goes beyond 1 year (1 year+).

Costs are influenced by the time period. In the short-run some of our factors of production (land, labour, capital and entrepreneurship) are in fixed supply. Some of these factors of production in the short-run are fixed. If we have a factory and we want to double our floor space, we need to buy some land, engage in a promise of sale, get permits, start building, start to furnish etc. It takes us for sure more than a year, therefore it is not possible in the short-run. In the short-run perhaps we can make our labour work overtime, we can hire new employees (not in the public sector - bureaucracy). In the short-run we have both fixed and variable costs. In the long-run, given that we can increase all of our factors of production, we assume therefore that all of our costs are variable. In the long-run we don't have fixed costs.

Short-Run Costs



Aggregate Costs - variable and fixed costs. The Fixed Costs do not change with the level of output. Irrespective of how much we produce, the curve remains horizontal (it does not fluctuate with the level of output). The Variable Cost has a particular curvature. Costs start to increase the more output we have, then there is an upturn and the increase is more rapid. The Total Costs run parallel to the variable costs and the difference between the 2 curves represents our fixed costs.

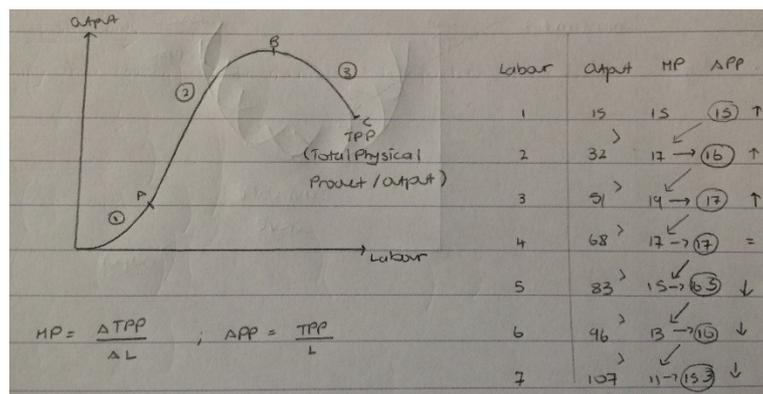
$$TC = FC + VC.$$

Cost per unit (cost/unit) - average fixed cost is at first high, then it declines quickly the more output we generate. Average variable cost. The gap between the 2 gets narrower, the more output we have. That is because our AFC is declining in a sharp way.

$$AC = TC / \text{Output}$$

Aggregate – an upturn and then costs start to increase at a much faster pace. This is because of the **Law of Diminishing Marginal Returns**. When we have an amount of capital which is over-manned by too many units of labour, we start to suffer from Diminishing Marginal Returns. From each additional unit of labour that we employ, we get less units in return.

What happens in reality?

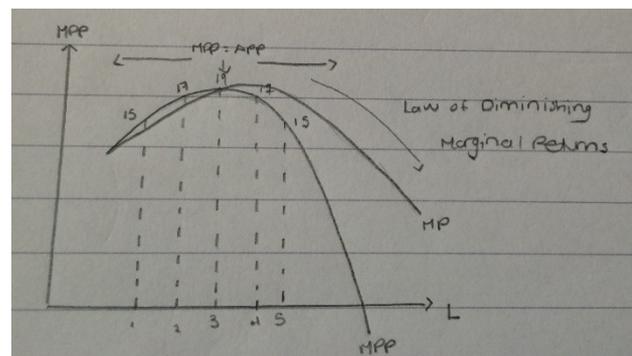


At the initial stages of production, we benefit from an increase in output, which is increasing at an increasing rate. After diminishing marginal returns sets in (point A), then output starts to increase at a decreasing rate. Then we reach a peak (point B), after which output starts to decline.

Marginal Physical Product - the additional amount of output that we get by employing another unit of labour.

$$MPP = \frac{\Delta TPP}{\Delta L} ;$$

$$APP = \frac{TPP}{L}$$



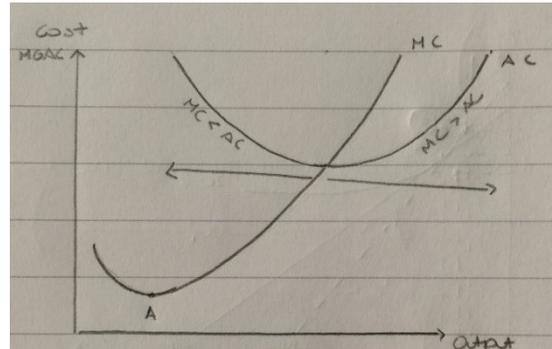
Why does the **APP (Average Physical Product)** curve starts to decline when it intersects with the MPP curve? Whenever we are adding a number which is bigger than the average, the average will increase, but the moment that we start adding a number to our average which is lower than the average itself, then the average will go down. As long as we keep adding a margin to our average, that is higher than the average itself, the average will continue to increase.

Comparing the output with the cost curves.

Marginal Cost - additional cost incurred in producing an extra unit of output.

MC and MPP curves are mirror-imaged curves. Why?

The Marginal Cost is going down, then it starts going up. At point A, the law of diminishing marginal returns sets in. We're going to pay our workers the same wage rate per hour. The first one gives us 15 units, the second one gives us 17. The cost per unit is going down because we're paying



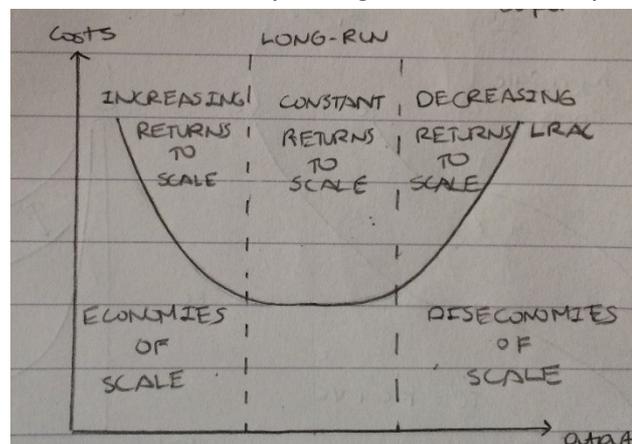
each worker the same wage, but the workers are giving us more output. The additional cost of producing an additional output starts to go down. The moment that Law of Diminishing Marginal Returns sets in, our marginal costs start to increase once again. We're paying the same wage, but we're getting less units of output. Therefore the marginal cost goes up. The highest output in MPP reflects the lowest cost in MC. If you had to divide the cost by output, you will get the MC curve.

It's the same thing with the Average Cost - declines to the left of the marginal cost but starts to increase to the right of the marginal cost. The moment that $MC > AC$, the AC starts to go up. When output is going up, costs are going down. When output is going down, costs are going up.

Long-Run Costs

LRAC = long run average cost

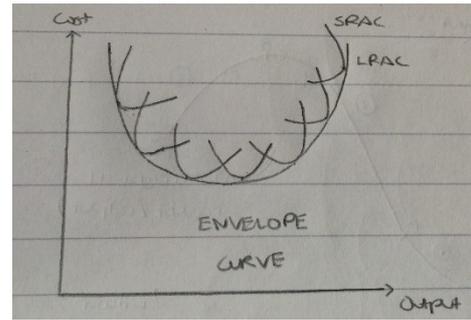
First we start to experience increasing returns to scale - inputting 100 units of input and in return getting 125. Increasing returns of output relative to what we are inputting. Because of this, we benefit from economies of scale - the cost advantages that enterprises obtain due to size, output, or scale of operation (container principle + division of labour + bi-products). Cost per unit starts to decline.



If we keep on producing, our input to output ratio is stabilised - inputting 100 and getting out 100. Therefore our costs will stabilise as well. At that point we have constant returns to scale.

If our firm grows beyond a certain point and it is too difficult to manage things, then it is highly likely that we become inefficient. Inputting 100 and getting 75 in terms of returns. It is not possible to monitor everything. Management problems, even perhaps industrial problems with the unions. The economies of scale are lost at this point. Workers are less productive because they feel more alienated.

The LRAC is made of a series of SRACs. In a nutshell, if we have 5 years, the long-run is made up of 5 short-run average cost curves. The LRAC is encompassing all the SRACs. The long-run is made up of the lowest possible cost on the short-run.



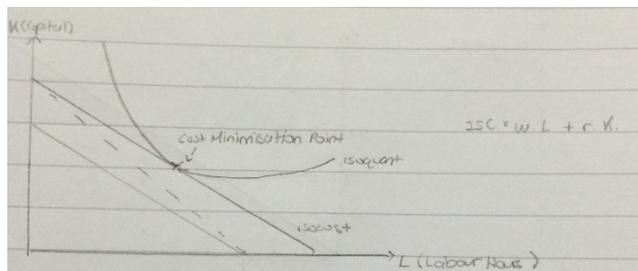
LECTURE 7 - MARKET STRUCTURES

Isocosts and Isoquants

Budget Lines and Indifference Curves from the firm's perspective. Instead of X and Y we have K and L. 2 inputs namely capital (machinery etc. that can be used in the production process) and labour hours.

Isocosts represent the amount of resources that the entrepreneur can dedicate to either capital or labour or both. In a nutshell, we can either dedicate all of our resources to capital and none to labour such that we have

a capital intensive firm or we can dedicate all of our resources on labour and none to capital such that our firm is labour intensive, or else a mixture of both. The isocost represents our wage bill + the cost to service capital.



$ISC = w \cdot L + r \cdot K$; $w = \text{wage rate}$, $L = \text{labour hours}$; $r = \text{rate of interest}$; $K = \text{units of capital}$.

Unless we have cash which is available, we have to obtain capital via credit. Wage is the cost of labour. Interest payment serves as a cost to capital. Similar to the budget line, the isocost can pivot and as well shift.

Reasons that can pivot or shift the isocost inwards:

- An increase in wages brought about by an increase in the inflation rate. Prices go up therefore workers will demand higher wages. The isocost, similar to the budget line, will pivot inwards.
- If the central banks decide to increase the rates of interest to lessen inflation, then the cost of servicing capital will increase as well. If there is inflation and wages are going to increase and at the same time, the rates of interest will go up, therefore the isocost will shift inwards.

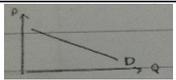
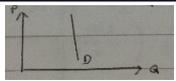
Factors that can lead to a shift outwards:

- When there is a deflation, it is highly likely that wages go down and that interest rates decrease. So eventually, the isocost will shift outwards. Deflation will effect both capital and labour.

- A result of more resources. If the entrepreneur has more resources available, he is able to get more capital and labour.

The **isoquant** represents a constant level of output throughout. The indifference curve was about constant utility and the isoquant is about constant output. Where the isoquant is at a tangent with the isocost is our **Cost Minimisation Point**. When we were discussing consumers, we were discussing about the optimisation of utility, now we are discussing the minimisation of cost. Produce as much as possible, with the least possible cost.

Market Structures

Structure	No. of Firms	Example	Freedom of Entry	Type of Product	Demand Curve
Perfect Competition	Very many	Agriculture	Unrestricted	Homogenous	
	Many	Restaurants	Unrestricted	Differentiated	
Oligopoly	Few	Oil/Cars/Banking	Restricted	Differentiated/Undifferentiated	
Monopoly	One	Utilities	Restricted/Blocked	Unique	

Perfect Competition represents the ideal situation for competition to thrive. In a way it is a bit to the extreme because although we tend to refer to it quite a lot in theory, it is very difficult in real life to have something as perfect competition (because of the number of assumptions taken). It is the best market structure we should have if we want to maximise welfare. It is that kind of structure whereby we have very many entrepreneurs. We have a lot of small businesses and each business has a negligible market share. Given that they are so small, no one has control over the market. There is freedom of entry. All those who would like to enter this business, can do so and there are no restrictions. The kind of good or service that we're dealing with is considered to be homogenous, meaning that all goods are the same (identical). In agriculture (the closest example of this kind of market structure), goods are very similar, however not identical. In this kind of market structure, given that producers are small, we tend to assume that the producers are price takers. This means that the producers do not have any control over the price (they don't influence it), but rather consumers have complete control over the price. We're taking a big assumption that is not realistic in real life, which is perfect knowledge. We assume that all consumers and all producers are aware of what is happening in the market, which is of course impossible. Because of this, there is no need for advertising. Because of perfect knowledge and because competition is so intense given that there is complete freedom of entry, it does not pay businesses to charge a

price which is beyond the market price. Given that we are assuming that there is perfect knowledge, consumers will immediately go to another vendor. The moment a particular business increases its price, it will be competed out of the market (increase in the price is not possible). Offering a lower price to increase the market share is technically possible but practically no. The market share of all these firms is negligible, so if someone is going to decrease the price, that won't result in higher sales because the enterprise we're referring to is small and does not have the capacity to expand. It does not pay to reduce the price because we cannot grow. Because of all these assumptions, we have a situation where we have a perfectly elastic demand curve. Because of this curve, this is a price-taking market structure.

Monopolistic Competition. In terms of numbers we do not have as much businesses as before, but in terms of size, they are bigger. There are no restrictions and whoever wants to enter the market is welcome. The good or service we're dealing with is a differentiated good or service. The goods in question are not identical but are similar (restaurants - pasta is similar in all restaurants but in terms of taste it might differ). Because of this slight difference in the product, now demand is no longer perfectly elastic but it is highly elastic. If the price of pasta A goes up it is highly probable that we will substitute it with pasta B.

Oligopoly. Now we have few firms, just a handful. They enjoy a bigger slice of the market and even the firms themselves, they are much bigger. The market is somehow restricted. It is not so easy to penetrate the market. The goods or services can be both differentiated or undifferentiated. Differentiated - in principle, cars are a means of transport but one car is different from the other (colour, type of engine etc.). Undifferentiated - the service or product is pretty much the same (home loan from banks or oil). Locally, all of our markets are considered to be either oligopolies or monopolies. We can consider our demand curve to be inelastic (it is less elastic than the one before). Both monopolistic competitive firms and oligopoly firms are considered to be price-makers, meaning that the firms have control over the price.

Monopoly consists of one firm which is dominant. The market is restricted or completely blocked to new entrance. The type of product or service is considered to be unique (you either consume that or else you don't consume anything). Examples: utilities (water, electricity). Our demand curve is highly inelastic. Not perfectly inelastic but highly. Of course, the monopolist is a price-maker as well.

Revenue

2 sets of revenues:

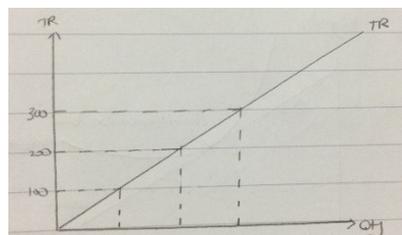
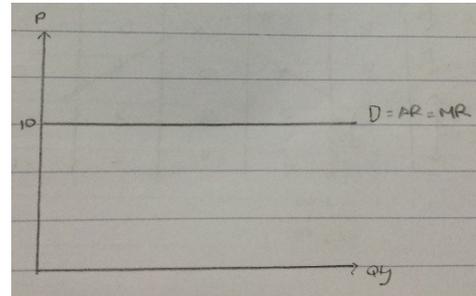
- Revenue structure of price-taking firms.
- Revenue structure of price-making firms.

Revenue Structure of Price-Takers

Qty	P	TR	AR	MR
1	10	10	10	10

2	10	20	10	10
3	10	30	10	10
4	10	40	10	10
5	10	50	10	10

Our demand curve is perfectly elastic since this is a price-taking market structure. Although the quantity is different every time, we have one price. The demand can change but for different quantities we have one price every time. This is why we have the same P.



Given that the price is the same throughout, then our **Total Revenue** curve is going to be 45degrees.

$$TR = P \times Qty$$

The price and the **Average Revenue** have the same number and are the same variables. Both the price and the average revenue are the same.

$$AR = \frac{TR}{Qty}$$

Marginal Revenue is equal to the change in total revenue divided by the change in quantity. Any marginal revenue that you can work out, will give you the same number (10). Marginal Revenue is defined as the additional revenue that we earn by producing an extra unit of output.

$$MR = \frac{\Delta TR}{\Delta Qty}$$

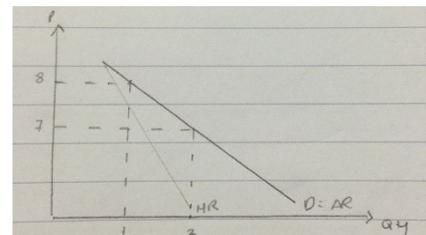
In this case, for the price-taking firm, the marginal revenue curve, the average revenue curve and the demand curve are all plotted along the same curve.

Revenue Structure of Price-Makers

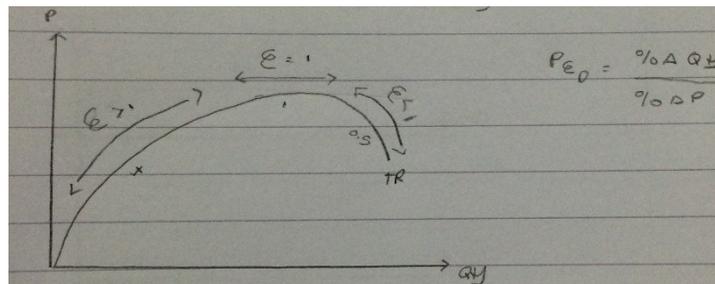
Qty	P	TR	AR	MR
-----	---	----	----	----

1	8	8	8	8
2	7	14	7	6
3	6	18	6	4
4	5	20	5	2
5	4	20	4	0
6	3	18	3	-2
7	2	14	2	-4

Total revenue and Quantity are the same 2 variables we use for the Demand and for the Average Revenue. Therefore the Average Revenue curve is equal to the Demand curve.



Marginal Revenue is the change in total revenue all over the change in quantity. The gap between the MR and AR increases with quantity.

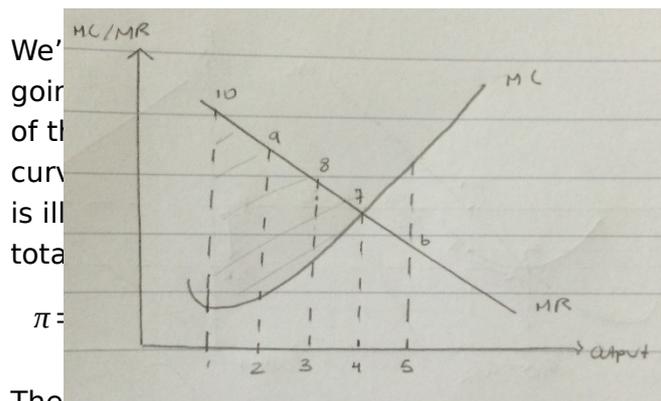


Total Revenue increases, stalls and then it declines. Elasticity represents by how much quantity will change given a change in price. What does it mean to have elasticity greater than 1? It means that a small percentage change in price will bring about a bigger percentage change in quantity and as a result of that, total revenue will go up. Quantity goes up because price goes down. Given that from 1 to 4, the percentage change in price is smaller than the percentage change in quantity, our elasticity is positive but at the same time it is decreasing (curvature). The less the elasticity, the less the increase in total revenue. The price elasticity degree starts to decline. The explanation of the curvature is price elasticity of demand.

LECTURE 8 - PROFIT MAXIMISATION AND MARKET STRUCTURES

Profit Maximisation - the aim of every business is to maximise its profits. We will be drawing the cost and revenue curves in order to determine what level of output we're going to produce and how we're going to maximise our profits according to that level of output.

Output	MC	MR	Contribution
1	4	10	+6
2	5	9	+4
3	6	8	+2
4	7	7	0
5	8	6	-2
6	9	5	-4



These aggregate figures (TR and TC) are not present in this diagram so we must work around it in order to manage to arrive at this

formula. We have to add other curves.

Marginal Cost - the additional cost incurred in producing an extra unit of output.

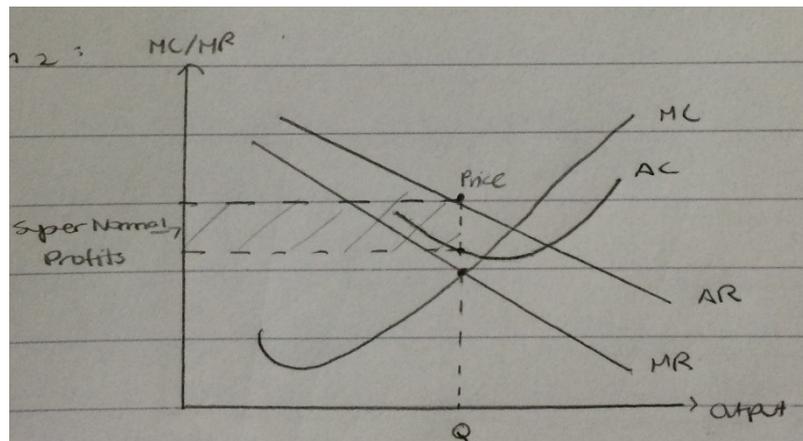
Marginal revenue - the additional revenue earned by producing an extra unit of output.

There is a particular level of output at which our profit level would be at its highest and our aim is to maximise profits.

The contribution that arises from the second good is lower than the first one but it's still positive. The fourth contribution is 0 since the marginal cost is equal to the marginal revenue.

At each and every level, we are doing a profit but there is only 1 point where we maximise our profits and that point is at 4 units of output. When we produce 4 units,

the marginal cost is equal to the marginal revenue such that we exhaust any gains that may arise from further production, therefore we should stop producing at 4 units of output. Why don't we stop at 3? If we stop at 3, we're going to miss out the net gains that can be achieved by producing the 4th good. We should keep on producing until the marginal revenue is equal to the marginal cost. There is still more room for higher profits. If we keep on producing beyond that point and we have a situation where the marginal cost is higher than the marginal revenue, we will still be running a profit but it won't be the maximum one.



We're going to sell our output at that point at which if we keep on drawing the line up, we will meet the Average Revenue Curve. That point is the price level that we're going to charge for that output. Now we know the price and the quantity and therefore we can find out our total revenue.

We need the Average Cost curve. Why does the average cost curve first decline, then there's a turn around and then it starts inclining? Because of the Marginal Cost curve. Up to the point where the marginal cost is lower than the average cost, the average cost will continue to decline. The moment that the marginal cost is higher than the average cost, the average cost will start to increase once again. The moment that the 2 intersect and the marginal cost goes beyond the average cost curve, the average cost curve will start to incline. Thanks to the Average Cost curve, we are able to determine our profitability level.

In summary, we need MC and MR to find out what is the profit maximisation point and basically tells us how much we're going to produce. Then we need to find out at what price we're going to sell that level of output, therefore we need our average revenue (since $TR = AR \times Q$). We need to find out the cost at that level of output. Therefore, we're going to insert the Average Cost Curve (since $TC = AC \times Q$) such that if we multiply the average cost by the quantity, we will get our TC.

3 scenarios:

- $AR > AC$ - Super Normal Profits.
- $AR = AC$ - Normal Profit.
- $AR < AC$ - Loss.

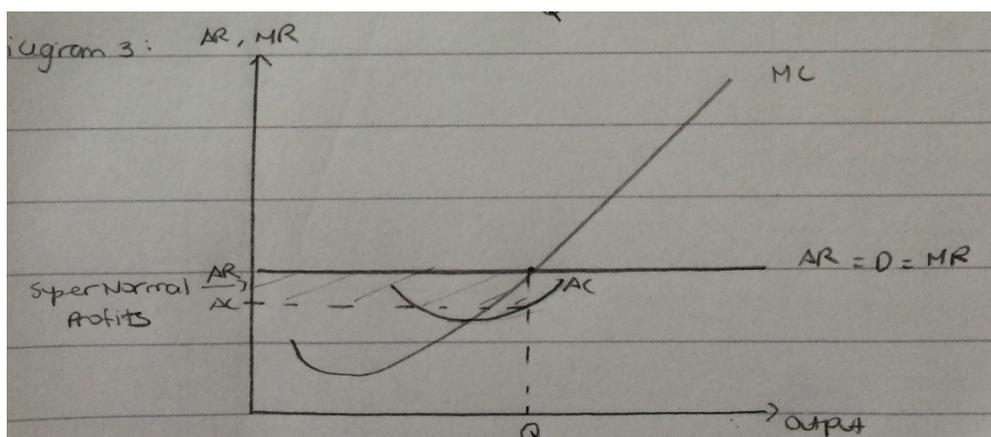
The profit definition in accounts is not the same profit definition in economics. In economics, there's more to just total revenue less total costs.

Opportunity cost - that level which guarantees a normal profit. In our costs we take into account that we have to at least generate our Normal Profit. From an economic point of view, we have to make sure that our normal profit is always going to be there, otherwise there is no sense in going into business. If we go into business and we earn less than the normal profit, we are doing a loss. When we go under our opportunity cost, we will be making a loss. The super normal profit is anything which is over and above the normal profit.

Is this diagram attributed to a price-making or price-taking firm? It is a price-making firm because the marginal revenue and average revenue curves are downward sloping which implies that the firm has some kind of control over the price. The demand curve for a price-taking firm is highly elastic. For a perfect competitive firm, AR and MR are equal to each other.

Perfect Competition

Perfect Competition in the Short-Run



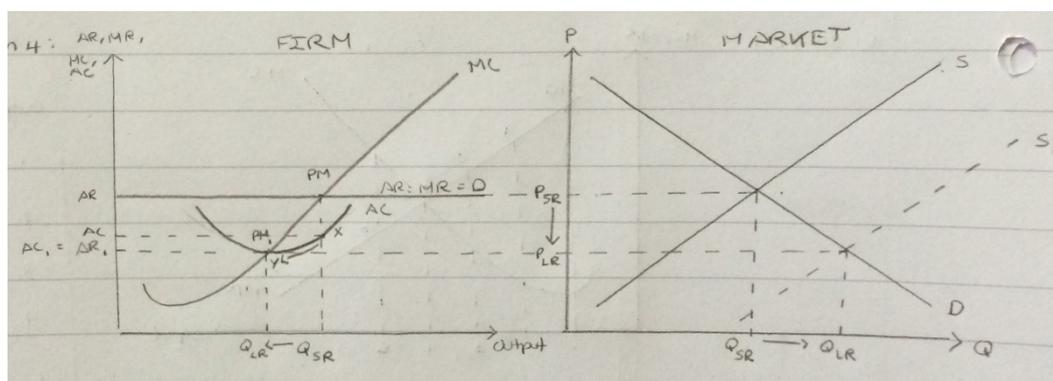
Given that the demand curve is perfectly elastic, the average revenue and the marginal revenue are the same.

Which curve do we need to determine the profit maximisation level? We need the Marginal Cost curve. The point of intersection is the profit maximisation. Given that the average revenue and the marginal revenue are the same, the price is also indicated by that same point of intersection.

We are doing super normal profits because the average revenue is greater than the average cost. The gap in between represents super normal profits.

In perfect competition there is perfect knowledge - all entrepreneurs are aware of the lucrative profits that are available in the market. Everyone is aware of these super normal profits and there is freedom of entry in the market. Therefore, in the long-run things are bound to change and that super normal profit level is going to be challenged.

Perfect Competition in the Long-Run



Market vs. one of the Firms in that Market

The firm has a market share equivalent to 1% (very small firm).

What happens from an aggregate point of view? Because of freedom of entry and perfect knowledge, the super normal profits will be competed out. Other businessmen are going to notice that there's lucrative profits, new entrepreneurs will join into the market and our supply curve will shift outwards. Our quantity in the long-run is going to increase and we're going to have a lower price.

How does this influence our firm? We know that our firms are price-takers. Given that the price declined, our firm will now have to accept a lower price. Because of this lower price, the average revenue and the marginal revenue curves are going to shift downwards as well. The profit maximisation point is where $MC = MR$. In the long-run it is going to suffer not only from a lower price but also a smaller market share. This is because of new players in the market. All the firms are going to reduce their quantity because there are more players so they have to live with a smaller market share.

Now, the average revenue is equal to the average cost so whereas before we had super normal profits, now our firms are only able to enjoy normal profits. The average cost in the long-run is at its minimum. Given the lower price, quantity and profits, if our firms would like to remain in business, they have to be more efficient. One way of how they can increase their efficiency is by cutting down on costs. Therefore average costs have moved from X to Y. That is an indication that the firms have to compete and a result of that competition, they have to be more efficient.

In summary, as a result of competition, consumers will benefit from more output and a lower price. On the other hand, the firms have to be more efficient. Under perfect competition, we are making sure that there is no wastage of resources (they are being efficiently used) and consumers are getting all the benefits from this.

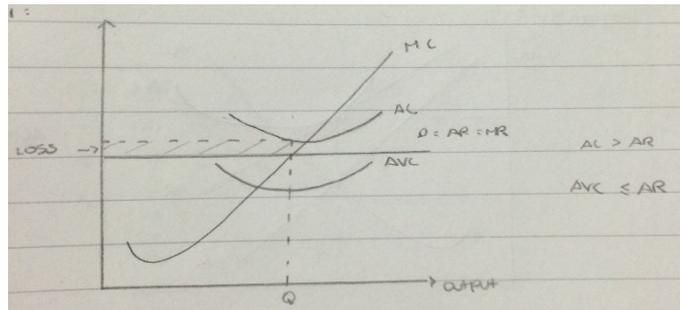
LECTURE 9 - SHUT-DOWN POINT AND MONOPOLISTIC COMPETITION

Shut-down Point - determines whether the firm should remain in business or not. What are the conditions that a firm should satisfy in order to remain in business?

A scenario where our firm is doing a loss in the short-run. We're going to qualify this loss.

Shut-Down Point in the Short-Run

We have a firm that is doing loss. We know this because the Average Cost is bigger than the Average Revenue. Therefore that gap should be the loss.



We have 2 cost curves (AVC and AC). In the short-run we do make a difference with respect to costs

(variable and fixed). In the long-run all the factors of production can be changed (increased or decreased) and therefore all costs are considered to be variable. Whereas in the short-run we have $AVC + AFC = AC$, in the long-run there are no longer fixed costs and therefore $AVC = AC$. The gap between the AVC and AC in the short-run represents our AFC.

We're not interpreting the loss from an accounting point of view but from an economic one. In economic terms, if we're doing a loss, it means that we're not covering at least a normal profit. We're not doing a level of profit that is equal to the next best alternative. If my next best alternative can give me a profit of 50k, and I am doing 30k, for me I am doing a loss of 20k (economic view).

Should this firm close? The answer is NO. This firm should remain in business. Why? The trigger point that is the make or break of whether the firm should remain in business is the AVC. The firm will remain in business in the short-run as long as the AVC is equal to or lower than the AR. In this case it is less than the AR. In the short-run, as long as the firm is covering all its AVC, that is fine. At worst, the firm can

afford not to cover its AFC or part of it. The AVC curve cannot be above the AR, because that means that the firm is not able to cover its AVC.

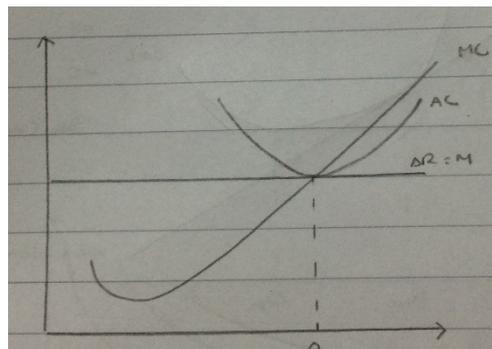
We refer to such a situation as **Loss Minimisation**. Whenever the AVC curve is below the AR, we say that we are maximising profits. However when the AVC curve is above the AR, we say that we are minimising our losses.

Shut-Down Point in the Long-Run

Because of freedom of entrance, more suppliers will be tempted to join the market. As a result of the outward shift of the supply curve, the aggregate revenue curve shifts downwards and therefore the firm has to take a lower price.

With respect to costs in the long-run, $AC = AVC$. All our costs are considered to be variable. It is imperative that all the firms are doing not at least, but are actually doing a normal profit.

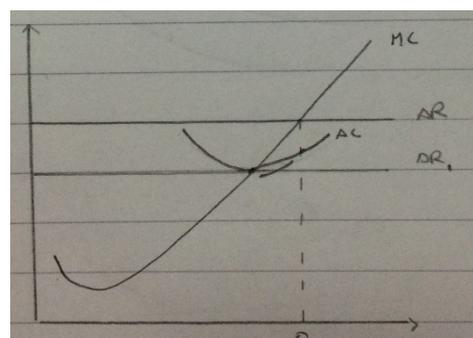
While a loss is accepted in the short-run, in the long-run the only situation that is tolerated is a normal profit.



It does not make sense to remain in a business where we are not maximising our profits. That is why in the long-run at least we have to generate a normal profit. There aren't any options in the long-run.

Advantages of Perfect Competition:

- It is one of the most efficient market structures. In the short-run, when we tend to assume that the price is higher than that of the long-run, the average cost of the model is not at its minimum. In the long-run when prices go down and AR curve shifts downwards, we are at the minimum possible cost on the AVC curve. Because of more suppliers, firms do their utmost in becoming more efficient. In the long-run they manage to reduce costs.
- Costs are among the lowest in the market. Given that we are dealing with a homogenous good (identical throughout), there is no point in advertising, because there is perfect knowledge. When you don't have customisation, you have lower costs.
- The firms increase their profits by producing at the lowest possible cost.
- This is also a market whereby the consumer has the upper-hand. If consumers would like to change their tastes and start to demand something else, given that producers are price-takers, they will have to move to another market. Consumers have the upper-hand both with respect to the price and also with



respect to what is produced. Consumers are better off because they have a strong voice in terms of what is produced.

Disadvantages of Perfect Competition:

- We have a homogenous good. It's one and it's the same throughout. It's either you like it or you don't. One of the biggest limitations of this model.
- Super normal profits are only available in the short-run. That is a problem when we have innovation and research and development. We cannot afford to have perfect competition in a pharmaceutical industry.

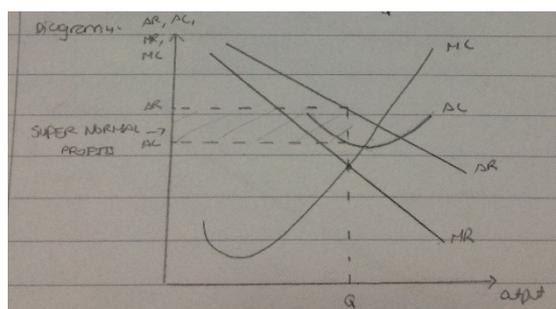
Monopolistic Competition (Imperfect Competition):

Dealing with many firms but not as many as in perfect competition. Now we no longer have a homogenous good but we have product differentiation that is for example when we're eating out, there are various restaurants which serve pasta and pizza but they differ in terms of taste. Freedom of entry but now there is no such thing as perfect information.

Monopolistic Competition in the Short-Run

From now onwards, we're dealing with price-making market structures. That is why we have downward sloping AR and MR curves.

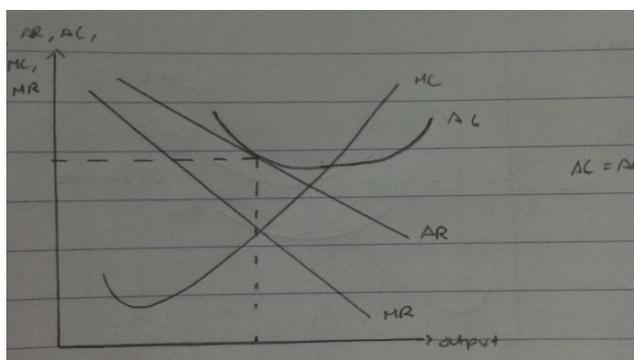
Profit maximisation is where $MC = MR$, which gives us an indication of how much we have to produce. The gap between AR and AC is our super normal profits in the short-run.



Monopolistic Competition in the Long-Run

Now we're going to remove the assumption of perfect knowledge. Now entrepreneurs are not sure whether there are super normal profits. Because of imperfect information, there may be some cases where super normal profits may persist in the long-run. In general, we tend to assume that in the long-run for monopolistic competition, because of freedom of entry, we have a normal profit.

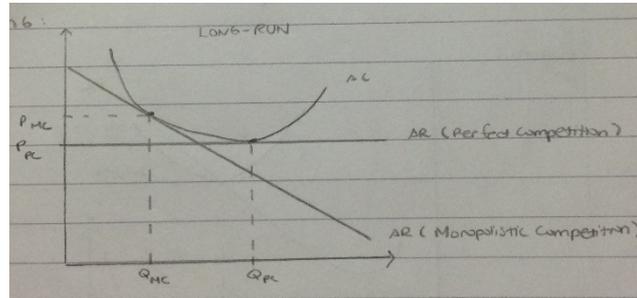
Unlike perfect competition, if there was inefficiency in the short-run, that inefficiency still persists in the long-run. Monopolistic competition still keep on producing at the same level of costs. If there is some inefficiency, it is not corrected or eliminated in the long-run.



The assumption of perfect knowledge is no longer assumed. Nevertheless there is the freedom of entry and exit. We may have certain instances that super normal profits may persist in the long-run but in this case which is the majority of the cases, the super normal profits are competed out in the long-run. $AR = AC$, therefore we have a normal profit.

Comparing Monopolistic Competition to Perfect Competition

We're assuming that both the Perfect Competition market structure and the Monopolistic Competition market structure have the same cost structure i.e. the way how the firms incur costs is the same. That is why we have just one AC curve. We have the perfectly elastic demand curve for Perfect



Competition and the downward sloping demand curve for MC. We are in the long-run, therefore both market structures are doing a normal profit ($AC = AR$ in both cases).

If we look at Monopolistic Competition, it is very clear that this market structure produces less at a higher price and of course the Monopolistic Competitive firms have to charge a higher price because they are less efficient relative to Perfect Competitive firms. Perfect Competitive firms are producing at the minimum possible costs whereas Monopolistic Competitive firms are producing at higher cost therefore they have no choice other than charge a higher price.

The superiority of Perfect Competition comes out from the fact that they are more efficient, giving us more output relative to Monopolistic Competition and at the same time because they are efficient, they can afford to give us more output at a lower price.

This diagram in a nutshell compares the 2 market structures and tells us why Perfect Competition is superior from a consumer's point of view over Monopolistic Competition.

Limitations of Monopolistic Competition

- There is imperfect information about super normal profits. Not everyone is aware where these super normal profits are and the extent/degree at which they occur.
- Given that we're dealing with differentiated products, it is very difficult to measure the demand curve. So far whenever we have dealt with the demand curve, we always assumed that we are talking about one particular good. Over here we have to group things together and that may be not so accurate. If we're taking into account the demand curve for eating out, which meal are we going to take? It is not so straightforward. They are similar goods but still different.
- Non-price competition. So far we have always assumed that competition is based only on the price but there is more than just the price. Given that we

are dealing with differentiated goods, in itself that is a good reason enough to justify non-price competition. Why is it that a restaurant is always fully-booked and another restaurant is always half-booked? Perhaps one serves more tasteful food than the other. This element of non-price competition is very important in this market structure and at the same time it is very difficult to measure as well. Most restaurants tend to compete on quality and not on price.

- Although at the beginning we mentioned that there is freedom of entry, in certain segments of Monopolistic Competition, we may have certain restrictions. Indian or Chinese cuisine are not so easy to penetrate. You have to have chefs that specialise in that kind of food preparation. The technique is more sophisticated. This kind of specialisation is a restriction and may be a hurdle for other entrepreneurs to enter into the market.

LECTURE 10 - MONOPOLY

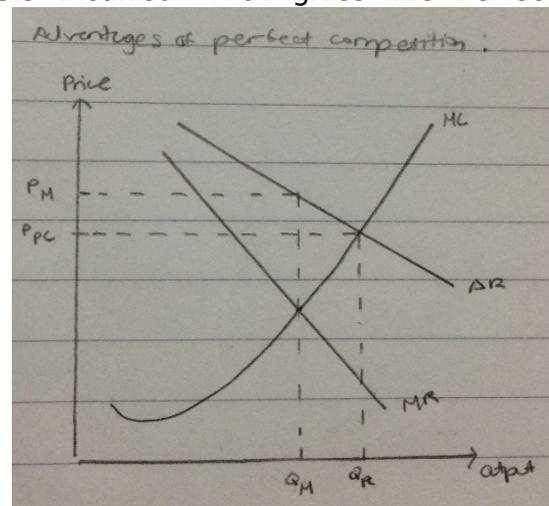
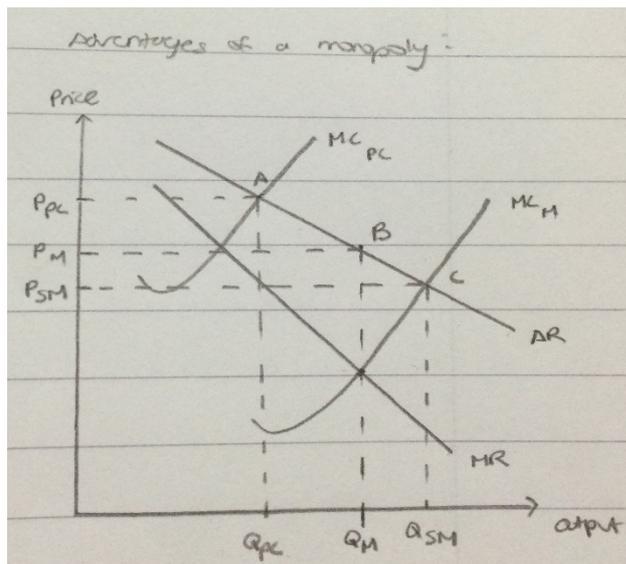
The Monopoly market structure is sort of that market structure whereby we have just one provider. Whenever we are referring to the monopolist, we are referring to the unique service provider (Enemalta and Water Services) which is providing a unique good. There is only that good and at the same time the service providers face no competition at all. Either because it doesn't make sense to compete in the market or else the Monopoly is guaranteed by law.

Comparing and contrasting the Monopoly firm with Perfect Competition. In order to do this, for one diagram we're going to assume that the marginal cost structure of both the perfect competitive firm and the monopolist is the same. We're going to make use of just one marginal cost curve. The other scenario is one where the perfect competitive firm and the monopolist are going to have different cost structures.

Advantages of Perfect Competition over Monopoly. Whenever we are dealing with Perfect Competition, we are used to drawing the Average Revenue and Marginal Revenue curves as the same curve which is the perfectly elastic demand curve (horizontal). Over here, we are dealing with both the Monopolistic and the Perfect Competitive firms in the same diagram. We're going to do some exceptions to our diagram in order to be able to compare the 2 market structures. In both cases we don't have such a thing as a perfectly elastic Average Revenue and Marginal Revenue curve, but we're still going to assume the theoretical principle whereby the Perfect Competitive firms price their output at the market price. Although profit maximisation in Perfect Competition takes place where $MC=MR$, it is also true that the Perfect Competitive firm sells its output at the price given by the market and that price reflects also the marginal cost incurred in producing that output. When we take the case of a price-maker (Monopoly), profit-maximisation similar to Perfect Competition is where $MC=MR$, but the price is further up. For Perfect Competition it is also true that we have $MC=MR=AR$ because the Marginal Revenue and the Average Revenue are on the same curve. The Perfect Competitive firm prices its output at a level which is equal to the marginal cost so with respect to this diagram, we have to find out where $MC=MR$ in order to respect our condition and that is the amount of output that the Perfect Competitive firm is going to give us at that price. When the Perfect Competitive firm has the same cost structure of the Monopolistic one, the Perfect Competitive firm will always produce more for a lower price. The Monopolistic firm (price-maker) will maximise its profits where $MC=MR$ so we know that this is our output, than to find out our price we have to go up until it meets the Average Revenue curve. The Perfect Competitive firms are very efficient and produce

at the least possible cost and also sell their output equivalent to the Marginal Cost. If we had to look at the long-run of Perfect Competitive firms, super-normal profits are not possible and the output is equal to MC, MR and AR. The Perfect Competitive firm sells its output at the same level of costs incurred. That gives the Perfect Competitive firm an advantage over the Monopolistic one in terms of more output and lower prices.

Advantages of a Monopoly over Perfect Competition. There are 2 Marginal Cost



curves. The Marginal Cost curve of the Monopoly is to the right of the Perfect Competitive firm and is also a bit downwards. It is situated bottom right. That reflects a situation whereby the monopolist will incur a lower cost for higher output. If the Marginal Cost curve is further to the right, it means that

there is more output and if it is further down, it means that the cost level is going to be lower as well. We have a situation where the Marginal Cost curve of the Monopoly is going to give us for sure more output which can be achieved at a lower cost. Over here it pays to have a Monopoly rather than perfect Competition, whenever the Marginal Cost curve of the Monopoly is further to the right and also downwards relative to the Marginal Cost curve of the Perfect Competitive firm.

A: it's the same story as the left-hand side diagram. We are after the point where $MC_{pc}=AR$ because Perfect Competitive firms sell their output at the same cost that they incur.

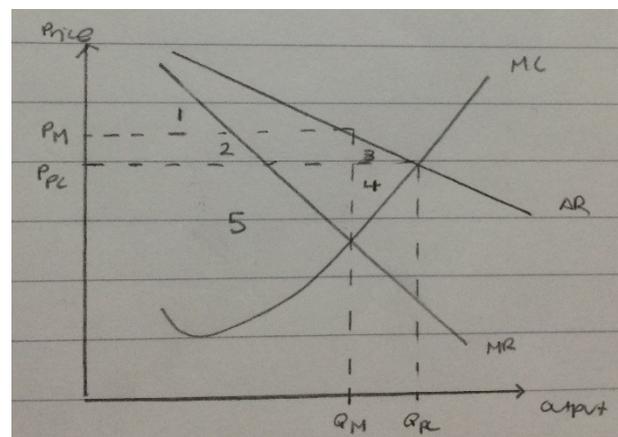
B: now we're referring to the Marginal Cost curve of the Monopolist and we're going to have 2 monopolies. One which is a private monopoly (run by the private sector) and the other one is a social monopoly (owned by government). The private monopolist is after different goals compared to the social monopolist. The private monopolist will operate in the classical way i.e. we have $MC=MR$ and then we go further up until we find the AR and that is how the private monopolist maximises its profits. B represents the situation of a Private Monopoly since it will maximise its profits by equating MC and MR and will sell that output according to where the AR is. That is the strategy chosen by the Private Monopolist. How will a government monopoly behave? The Social Monopolist will behave very similarly as the Perfect

Competitive firm because if you had to look at the curves, the private and the social monopolist have the same cost structure (both of them are making use of the same marginal cost curve). Unlike the Private Monopoly, the Social Monopoly will sell its output at the same price level of its cost ($AR=MR$). This is the same story as in Perfect Competition. The Social Monopolist will eventually supply even more than the Private Monopoly and at the same time, that higher level of output will be supplied for an even lower price than the Private Monopoly. Enemalta - before, utility and electricity price were cheap. The average price for unit of electricity was 10c, then in a matter of 1 or 2 years, from 10c per unit, the Average Cost went up to 16c per unit. They realised that they were incurring huge losses and therefore they had to change their pricing model. It moved from a Social Monopoly to a Private Monopoly and therefore they increased the price and started to supply less electricity. We have a scenario where it pays to have a monopoly as long as we have a different cost structure. At times, the Social Monopoly, unless abused, can also be of more benefit to society when compared to the Private Monopoly.

Why is it that at times a Monopoly is of more benefit to society than Perfect Competition?

Monopolies can benefit from economies of scale. When the production process is considerable, there is scope for economies of scale. Perfect Competitive firms cannot benefit from economies of scale because they produce a limited amount. Given that we have economies of scale, the benefits of those economies can be passed on to the consumer. At the same time we also know that in the Monopoly market structure there is a complete block to new entrance. It means that both in the short-run and in the long-run, the monopolist is able to enjoy super-normal profits. Its benefit is that thanks to those super-normal profits, the firm is able to finance product innovation and development. Pharmaceutical products - unless there are super-normal profits, these companies cannot finance research and it's only through research that we get new products. Drugs are so costly that it is impossible to finance new drugs a Perfect Competitive model. We can only have new drugs thanks to Monopolies.

Comparing the Monopolist and the Perfect Competitive firms but now we're going to discuss economic welfare. Welfare in economics does not refer to welfare states or social benefits but we understand well-being. Now we're going to compare the economic well-being that is produced by the 2 market structures. We're going to discuss this economic well-being in terms of consumer surplus, producer surplus and total economic well-being. Calculating the economic well-being created by these market structures, how much is generated in total and then segment this total in terms of how-much of that well-being is enjoyed by consumers and how much accrues to producers.



Perfect Competition:

- Consumer Surplus – anything which is over and above the market price. If the willingness to pay – the market price, is a positive value, that is the consumer surplus. If they are equal, then Consumer Surplus is 0. Areas 1,2 and 3 because the consumer surplus is anything which falls under the Average Revenue but it is above the dotted line which indicates the price.
- Producer Surplus – there is one price but still below that price there are different values of output which can be supplied for less. What the firm is willing to produce for a particular price but ends up charging a higher price. Areas 4 and 5 because these areas are to the left of the MC and they fall below the price.
- Total Economic Welfare – areas 1,2,3,4 and 5.

Monopoly:

- Consumer Surplus – area 1 because it is above the price and below the AR.
- Producer Surplus – areas 2 and 5 because we are considering the area which is under the price charged by the monopolist and to the left of the quantity produced by the monopolist.
- Total Economic Welfare – areas 1,2 and 5.

Consumer Surplus – it is evident that in terms of well-being, consumers are better off with Perfect Competition. Under Perfect Competition we have also areas 2 and 3 and that reflects of course higher economic well-being for consumers.

Producer Surplus – we have 5 which is common in both but then we have 2 for the Monopolist and 4 for the Perfect Competitive firm. The area covered by 2 outlays the area covered by 4. The producer surplus under the monopolist is higher relative to that under perfect competition.

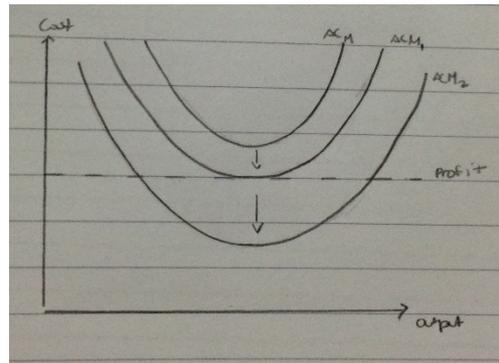
Total Economic Welfare – Under Perfect Competition we're covering all areas but under the Monopoly we're missing areas 3 and 4. It is higher under Perfect Competition as opposed to the Monopoly.

What about 3 and 4? They are lost under a Monopolist scenario because of what we refer to as **Deadweight Loss**. We know that the Monopoly market structure is inefficient as opposed to Perfect Competition and that inefficiency is reflected into higher costs, lower output which of course lead to lower economic welfare. This lower economic welfare (loss in economic welfare) under the Monopoly is represented by areas 3 and 4. These areas represent our Deadweight Loss under the Monopolist. These areas are lost due to inefficiency. Neither the producer nor the consumer will benefit from areas 3 and 4 under the Monopolist scenario.

Main Conclusions: consumers are better off under PC. Producers are better off under the M scenario. Total economic welfare is higher under PC. M in terms of economic welfare is inferior to PC because of Deadweight Loss.

Barriers to Entry in Monopoly Market

- One of the most common barriers to entry used by Monopolists to limit the possibilities of new entrances is **Predatory Pricing** which is illegal. What is happening right now in the oil market (reached its lowest point). Let's assume that in order to generate a profit, we have a price that has to be charged to break-even. If a new producer tries to enter the market, the monopolist will charge a price that is below the profitability level so that the new firm is artificially competed out. The monopolist will lower the price even lower than the profit and therefore he will make a loss in order to compete his competition out. The moment you notice that someone is trying to enter the market, you reduce the price artificially, the new entrant cannot compete, so he fails and the monopolist can rise his price to the original one once again.
- **Natural monopoly** - a situation where the market cannot sustain more than one firm or it is next to impossible to have more than one (Water Services).
- **Legal Protection** - Governments can limit or prevent entry to industries with various controls (for example, licensing requirements, limits to access to raw materials). Enemalta benefits from it.
- Already established monopolies enjoy **economies of scale**. When someone is about to enter in the market, given that output will be low, the number of customers will be low so there won't be economies of scale. Someone who has been in the market for a number of years enjoys economies of scales but that is not possible for new entrants.
- **Ownership of resources/control of outputs** - you can only sell that particular brand. If you manage to control all the outlets, your competitor, unless he opens other venues, won't be able to sell his products. Guarantees a barrier to entry against a potential competitor.
- **Aggressive and intimidation tactics**. You can intimidate someone business-wise. It is always difficult for someone who is trying to get into the market to compete against an advertising campaign of someone who has been in the market for a long time. Aggressive tactics can also consist of unlawful practices - sabotage in the capital equipment of the firm.



LECTURE 11 - OLIGOPOLY

In the Monopoly market structure we have just one seller, so the monopolist can discriminate between customers. This **price discrimination** can take place in 3 ways:

- The monopolist will discriminate on the basis of the **willingness to pay** i.e. he will charge a price according to the willingness to pay of the customer.
- **Batches or ranges**. In Malta the price of electricity or water takes the form of these batches. There is some form of discrimination according to how many units one consumes.
- The monopolist applying **different prices for different groups** but the price is the same within the group i.e. imagine we have customers who are making use of mobile phones but those who have prepaid telephony are charged a certain tariff and those who have a contract benefit from a different tariff. The tariff is the same within the same group but is different from other groups.

There is no such thing as one price structure but rather the monopolist can discriminate among his customers based on these 3 points.

Oligopoly

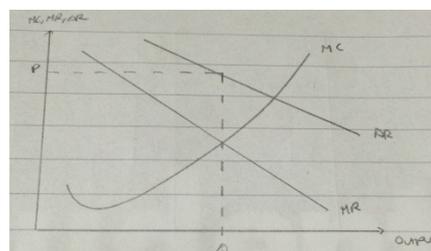
In Malta we mainly have an oligopoly market structure. Firms operating in the oligopoly market structure (a couple of firms), may either engage into a price war against each other i.e. may decide to compete in a very intense way to increase their market share or else they can agree between themselves and they will be able to act as a monopoly. In itself the market represents a number of challenges with respect to the freedom of entry. There is some form of restriction. There are few firms and there is some form of interdependence in the market i.e. given that we are just a handful of firms in the market, my actions will influence what others will do or their profitability levels. Firms can take unilateral decisions but they have to take them by keeping in mind how the others will react.

Collusive agreements under Oligopoly

Firms formally agree to form what we refer to as a **Cartel**. The most famous cartel in the world is OPEC which is made up of a number of countries mainly Arab, African and Latin American countries. Now there are more countries who are exporting oil and also oil is no longer so much in fashion. The future fossil fuel is shay gas (it comes from the ground and it is extracted through fracking - inject high pressure water with gas). Because of this and the new technology in this area, the United

States has managed to almost do without oil imports. The price of oil right now is about 37 dollars and it can go as low as 30 or even less by next year. This is happening because the OPEC are agitated because they are losing their customers. They are trying to engage in predatory pricing. They are trying to drive companies producing shay gas out of business.

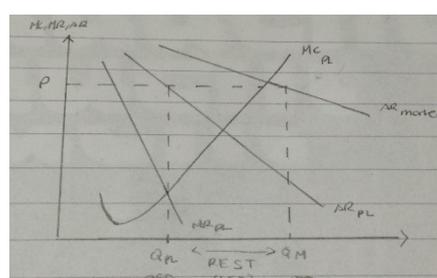
The usual classical diagram whereby the firms will agree to maximise their profits and the firms will act as a monopoly. They will restrict others from entering into the market. These firms will benefit from super normal profits both in the short-run and in the long-run.



Tacit Collusion

Companies that informally agree, meaning that firms do recognise the fact that if they are going to compete, they are going to be worse-off. They are going to agree in an indirect way that it is best for them not to compete, both in terms of prices and perhaps even advertising. We're talking of a handful of firms and the first form of tacit collusion that we may have might happen on the basis that there is a firm which is considered to have a dominant position in the market and therefore this firm is considered to be the **price leader**. The other firms will have to follow the lead of the dominant firm. Banks tend to agree by not competing in terms of the rates that they offer.

We have a scenario where the price leader is maximising his profits ($MC=MR$ for PL). Average revenue curve of the price leader represents the demand curve of the price leader, whereas the other average revenue curve represents the demand curve of the market. When we have the profit maximisation of the price leader, we get the market share of the price leader. The remaining firms, will have to sell their units at the same price that is being charged by the price leader. We have a situation where there is a dominant firm in terms of market share and it is able to influence the price at an extent where the remaining firms have to charge their price irrespective of their profit maximisation situation. It may be the case where some of the rest may not be maximising their profits in order to follow the lead provided by the dominant price leader.



Barometric Pricing

We have another form of tacit collusion whereby we have a price leader but he does not enjoy a dominant position.

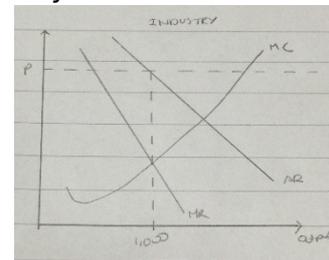
It can take 2 forms:

- The form of **average pricing** example importers in a certain industry decide that whatever they import must be sold at a mark-up of 25%. This works significantly in agriculture and fisheries. They tend to price goods according to average pricing.
- There is a **rule of thumb** in the sense that there is benchmarking. This happens a lot in clothing. For example when the price is 29.99 or 39.95. Outlets decide to price their goods or services on benchmarking. There is no one dominant in the area but there is an outlet considered to be the price leader and every other outlet benchmarks in line with him.

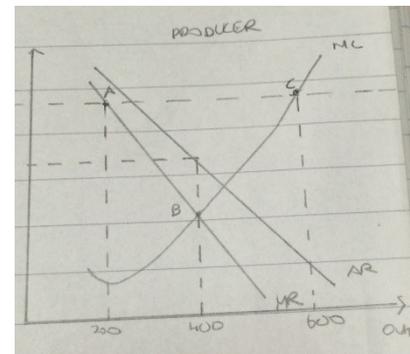
Break-Down of Collusion

We have an agreement but this agreement is going to break-down.

Here, we have the industry. Let's assume for the sake of simplicity that there are five producers in this industry. These 5 producers will come together and somehow they will have to agree on a profit maximisation level of output that will suit all of them and according to that profit maximisation, they will produce 1,000 units and sell that output at the price P. For the collusion to remain enforced, they will have to divide between them the output so we are going to assume that each and one of them will produce 200 units (1,000 shared equally between 5). These are the rules for the collusion to hold.



Now we can see how this collusion will reflect on one of these five producers. Each producer will have a quota of 200 units. The price is set by all parties. If we had to see how that reflects on a single producer, we observe A. It is selling that output at a marginal revenue that is set by all parties. A is the situation that we have if the collusion is to hold between all parties. If our producer decides to break away from collusion and decides to maximise its profits instead, then we have B. The producer will be better off with B because it will manage to sell more for a slightly lower price and that will earn our producer more profits because it is the profit maximisation point. In terms of surplus, we have 200 units. Our producer can even decide to challenge the collusive agreement by keeping on charging the same price as set by the collusion, but instead of sticking to its quota (200), it may decide to produce as much as it can (600). In terms of surplus now we have 400 units.



Game Theory

We're going to have a look at the advantages of having competition (collusion break-down) and observe why it pays to collude. Prisoner's dilemma.

There are 2 producers X and Y. Both of them start this game in quadrant A whereby they are selling this particular good for 2 euros. At this price level, both of them generate 10 million euros of profit each and there is collusion so they are agreeing

that they should charge the same price. Something happens and this collusion breaks-down so the 2 firms engage into a price war. They will start to compete on the basis of the price. At B, Y decides to reduce the price to 1.80 on the assumption that X will not follow. Y is getting part of the market share of X because X did not reduce its price. The profitability of Y will go up from 10m to 12m at the expense of the profitability of X which will go down from 10m to 5m. X will reason the same way. It will decide to reduce its price to 1.80 on the assumption that Y will not do the same. Similarly, the management of X will reason out that this move will increase its profitability from 10m to 12m at the expense of the profitability of Y. Initially, the profitability is 20m euros. When either one of them decides to reduce the price, the profitability goes down by 3m euros. There is already someone that is worse-off. In reality, both of them will be proved wrong in their assumption i.e. when one reduces the price, immediately the other one will do the same (quadrant D). They started with 20m euros and ended up with 16m euros. Each time, the total profitability level is going down. In a way this price war can continue forever because the quadrants can be extended. If they decide to literally compete against each other, they will end up in mutually destructing themselves. Competition is beneficial to the customer because the price level will continue to go down but this is very expensive for the producers because they will keep on using from their profits.

	Y	
	€2.00	€1.80
Y	A €10m each	B €12m → Y €5m → X
X	C €5m → Y €12m → X	D €8m each
	€2.00	€1.80

There are 2 strategies and an outcome that we can refer to this particular case:

- **Maximax** - a strategy whereby a firm will try to improve on something which is already good. You try to maximise the maximum. For Y the maximax strategy is B. For X the maximax strategy is C.
- **Maximin** - defined as when you try to minimise the damage done by a bad outcome. Over here the bad outcome for Y and X is a profitability level of 5m euros. We can minimise the damage by reducing the price so that at least they go up to 8m euros. 8 is less than 10 but at least it is better than 5. The maximin strategy for both Y and X is quadrant D because both of them will minimise the damage caused by the other.
- **Nash Equilibrium** - most of the time it represents the maximin strategy. It is the result of every firm trying to improve its position. As a result of that, everyone will end up worse-off. Nash equilibrium starts by everyone trying to improve their position and be more egoistic. Both Y and X try to go to B and C and as a result they end up both worse-off. Therefore quadrant D will end up to be the Nash Equilibrium as well.

It pays for companies to collude rather than to compete. Collusion is more beneficial.