Introduction to Microeconomics

Economics is the study of the allocation of scarce resources.

Resources include
- Land — All natural resources
- Labour — All human effort
- Capital — All man made resources used in production

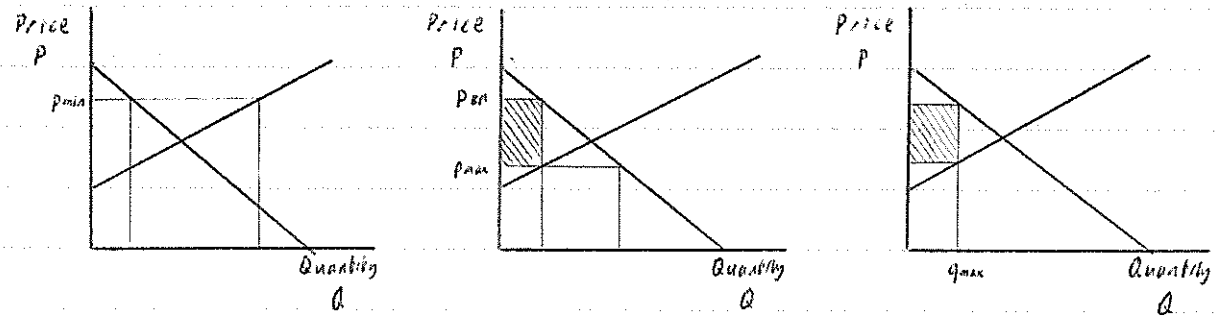
A resource is scarce if there would not be enough of it to satisfy all the people who would want it if it had a zero price.

An economic system determines what goods and services should be produced, how they should be produced and who should consume them. Systems include centrally planned, free and mixed economies.

Supply and Demand

Quantity demanded is a function of a goods price, the price of other goods, consumer income and consumer tastes. Quantity supplied is a function of a goods price, the opportunity cost of resources to produce the good and the technology available to produce the good.

If quantity supplied exceeds demand, stocks will build up. prices will be cut an production will reduce. Conversely, if quantity demanded exceeds supply, shortages will cause price rises and increased production. Thus prices tend towards a point where supply and demand are equal.



A price floor above the free market price leads to excess supply. If the government does not buy this up, suppliers may be tempted to offer goods for less.

A price ceiling below free market prices leads to excess demand and shortages. This may mean a black market develops.

A quota below the equilibrium quantity traded causes higher prices and profits.

Whether subsidies and taxes are put on suppliers or consumers, we reach the same equilibrium point. A subsidy will decrease the price paid by consumers increase the price recieved by suppliers and increase the equilibrium quantity trade A tax will do the opposite.

Theory of the Firm

We assume that firms attempt to maximise economic profits, where

economic profits = economic revenue - economic costs

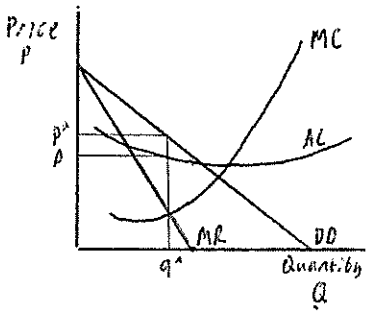
Economic costs include the opportunity cost of the owners time and money. That is, how much these would earn working for the best alternative.

Normal profit is the level of accounting profit needed to give zero economic profit. Supernormal profit is the amount of excess.

Marginal cost is the increase in total costs caused by increasing output by one unit. Marginal revenue is the increase in total revenue caused by increasing output by one unit.

The profit maximising output occurs when marginal cost is equal to marginal revenue since both are equivalent to the change in profit with output being zero.

Average cost has the obvious definition - total costs divided by units produced



On the diagram, please note the following

- MC cuts the lowest point of AC
- MR is half of DD
- q^* occurs where MC and MR cross
- There are supernormal profits of $p^* - p$

Economies of Scale

The average cost initially decreases with increased output due to economies of scale

- Spreading of fixed cost
- Specialisation
- Physical economics (bigger machines more effective than smaller ones)
- Finance and bulk purchase (bigger firms get better deals)
- Sale of Byproducts
- The principle of multiples

When output increases further, diseconomies of scale cut in.

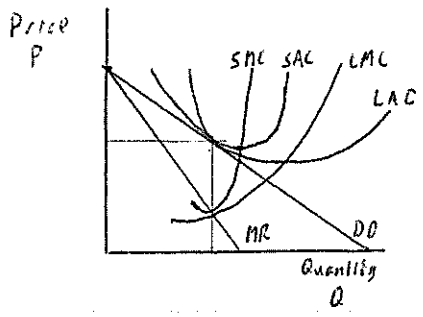
- Large companies require managers to manage managers.
- Dilution of ownership.
- Quality of resources decreases
- Physical diseconomies

This also explains the shape of the marginal cost curve. A similar effect occurs when considering output as a function of worker numbers.

The Effect of Time

The short run is the period of time where only partial adjustment is possible.
Only variable factors of production such as unskilled workers can be changed.
The long run is the period of time where full adjustment is possible.
All factors, including fixed factors of production such as capital can be changed.

Short and long run average and marginal costs have the obvious definitions

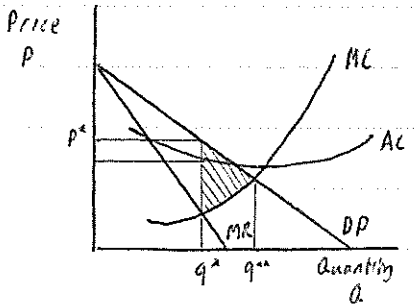


In the short run, output should be set so short run marginal cost equals marginal revenu
If the company doesn't cover variable costs at this level it should shut down.

In the long run, output should be set so long run marginal cost equals marginal reve
If the company is making an economic loss, it should exit the industry.

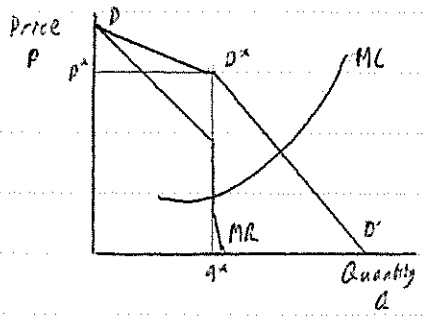
Market Structures

The MR curve depends on the level of competition

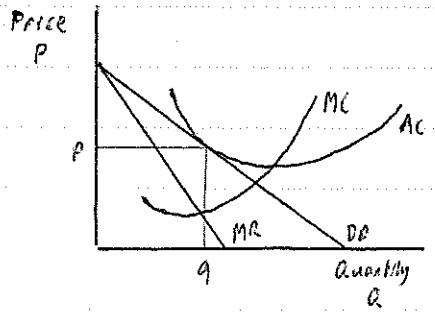


Monopolies face no competition and so can make supernormal profits. Since output q^* is less than output with competition q^{**}, monopolies have a social cost represented by the shaded triangle. Monopolies may be regulated to limit this.

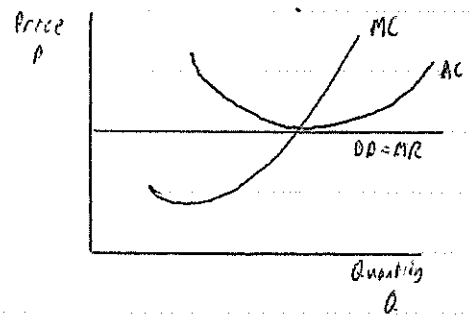
Because monopolies have no competition, they may be able to introduce price discrimination. This would allow increased profits, but also increased output.



Oligopolies are small numbers of competing firms. Each firm believes that price decreases will be matched, but price increases will not. This lead to the kinked supply curve giving stable price and output levels.



Monopolistic competition occurs when there are many firms supplying the market, so each firms actions does not affect the other firms, but that each firm sells a differentiated product, so firms retain some power to influence the sale price



Perfect competition occurs when all firms produce exactly the same product and customers have perfect information and act rationally. Thus if one firm sells for fractionally less, all customers switch to buying from that firm.

Moreover, we assume a very large number of firms and free entrance and exit of firms, so changes in one firms output has no effect on the market and collusion can be ruled out.

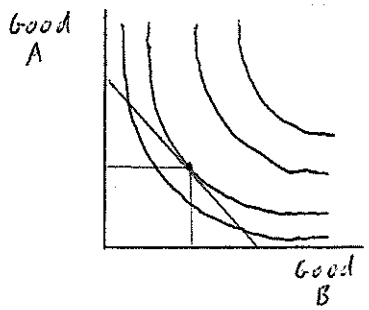
Consumer Choice

When modelling consumer choice, we assume that

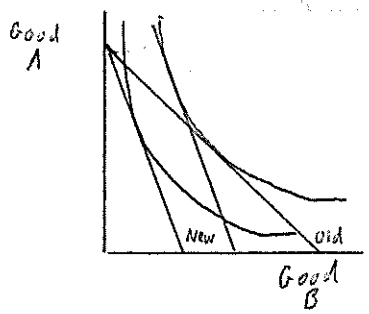
- Consumers can rank two bundles
- Consumers prefer more than less
- Consumers have diminishing marginal substitution.

- Prices of goods are fixed
- Customers income is fixed

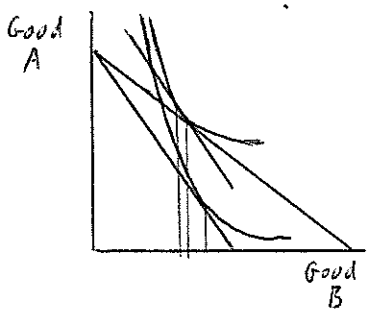
Plotting indifference curves gives



We choose the point tangent to an indifference curve since this gives the best indifference curve that our budget can buy.



When the price of a good changes, we split it into two parts. First the substitution effect caused by the change in relative prices (holding utility cons Then the income effect caused by the change in real income of the customer (holding the slope constan



The substitution effect is always negative, however with inferior goods the income effect is positive, and with giffen goods it is greater than the substitution effect - thus a price rise causes increased demand.

Utility and Insurance

When modelling utility, we assume that

- A person can rank wealth
- They prefer more than less
- They have diminishing marginal utility.

This implies that they are risk averse, where

Risk adverse	reject a fair gamble
Risk neutral	may reject or accept a fair gamble
Risk lover	will accept a fair gamble

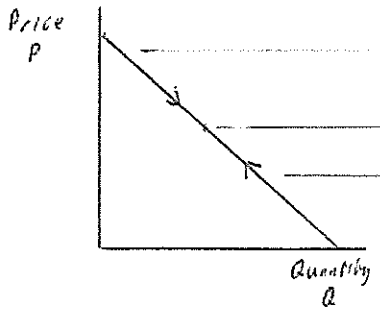
Insurance works because the utility functions of insurance companies and individuals differs in such a way that the utility of both is increased if the insurance contract is taken out. That is for a utility function U,

$$E(U(\text{individuals wealth} - \text{loss})) \leq U(\text{individuals wealth} - \text{premium})$$
$$E(U(\text{companies wealth} + \text{premium} - \text{loss})) \geq U(\text{companies wealth})$$

Of course, the insurance company must also take care to consider problems of adverse selection and moral hazard.

Elasticity

Elasticity of demand = $\frac{\%\text{ change in demand}}{\%\text{ change in price}}$



Elastic (< -1)

Unit Elasticity ($= -1$) [Maximum revenue]

Inelastic (> -1)

[Giffen goods have +ve elasticity]

Income elasticity = $\frac{\%\text{ change in demand}}{\%\text{ change in income}}$

+
1 Luxury } Normal
0 Necessity }
−
Inferior

Cross Price elasticity = $\frac{\%\text{ change in demand}}{\%\text{ price change in good Y}}$

+
0 Substitute goods (alternatives)
− Complementary goods (jointly consumed)

Elasticity of supply = $\frac{\%\text{ change in supply}}{\%\text{ change in price}}$

Public Sector Finances

Governments raise money in five ways

- Taxes
  - Direct — On factors of production
  - Indirect — On expenditure
- Profits from public corporations
- Sale of public assets
- Borrowing
- Printing money

The way they spend it is classified in three ways

- By department (health, defense, etc)
- By sector (central government, local authority, public corporations)
- By function (wages, goods and services, grants, capital expenditure)

The excess of a government's expenditure over income is the fiscal deficit or public sector borrowing requirement. If this is negative it is termed a public sector debt repayment. The cumulation of this is called the national debt.

Economic Growth

This is the increase in real (inflation adjusted) GNP or GDP. It is caused by increases in the following factors

- Capital — Economic investment outstripping depreciation of existing capital
- Labour — Population increase, proportion of people working or an increase in hou
  In addition education and training can improve the quality.
- Land — Territorial conquest or better use of existing land
- Raw Materials — Increased input of raw materials after discovering new sources
- Knowledge — Invention — Discovery of new techniques
  Innovation — Implementation of new techniques
- Efficiency — Improving use of the above

Inflation

This is the rise in the average price of goods over time. There are two causes

Demand pull is where there is excess demand so prices are bid up.
Cost push is where input costs increase leading to a price rise.

The government wants to control inflation because of the following problems

- Unanticipated inflation
  - Unintended and arbitrary redistribution of wealth from lenders to borrowers
  - Inflation risk premium causes increase in real interest rates
  - Those due to recieve money on fixed price contracts loose out.

- Anticipated inflation
  - Money illusion causes 'wrong' economic decision to be made
  - Money wasted in communicating price changes
  - Shoe leather costs due to holding money in riskier assets
  - Cannot maintain exchange rate
  - Risk of hyper inflation
  - Institutional sluggishness in responding to changes
  - Higher risk of unanticipated inflation

Governments try to control inflation using the following methods

- High interest rates. In general, these restrict the money supply. In particu
  - Demand pull inflation is reduced by high interest rates causing low demand.
  - Cost push inflation is reduced by a strong currency making imports cheaper.
- Income and prices policies. Set a maximum increase.
- Expectations. Low inflation expectations are self fulfilling
  - Independence of central bank
  - Exchange rate target

Unemployment

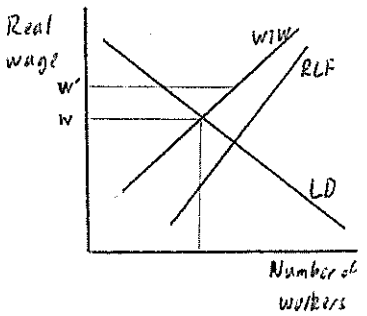
Traditionally, unemployment is split into six types

Demand deficient	When demand is low, people will be unemployed until it picks up.
Classical	Wages held above equilibrium causing unemployment for others.
Structural	People are skilled in jobs no longer available as their industries die out.
Technological	People are skilled in jobs no longer available despite nondeclining industries
Seasonal	Industries are seasonal and so the employment is also seasonal.
Frictional	Looking for a new job or unable to work - 'normal' unemployment.

A more modern approach has two categories

Voluntarily	Unemployed but not prepared to accept a job at the going rate
Involuntarily	Unemployed and prepared to accept a job at the going rate.

This allows us to plot the following graph



WTW - willing to work
RLF - registered labour force
LD - labour demand

If the wage rate w' is higher than the equilibrium w, there is involuntary unemployme
Wages may be above the equilibrium because of

- Trade union power
- Minimum wage legeslation
- Wage contracts
- Insider outsider distinctions
- Efficiency wages

International Trade

Country X has an absolute advantage over country Y in producing a good when it can produce that good using fewer scarce resources than country Y.

Country X has a comparative advantage over country Y in producing a good when it has a lower opportunity cost than country Y.

When two countries have comparative advantage with each other in different goods, it is profitable to trade.

The terms of trade for country X is the quantity of domestic goods that must be giv up for one unit of imported goods. The terms of trade index has an inverse relation

$$\text{Terms of trade index} = \frac{\text{Index of export prices}}{\text{Index of import prices}} \times 100$$

As well as specialisation, benefits are caused by

- Economies of scale
- Wider range of goods
- More competition

This last can cause domestic problems as people loose their livelyhood, hence free trade restrictions by means of tarrifs, subsidies, etc. In addition transport costs and diseconomies of scale reduce efficiency.

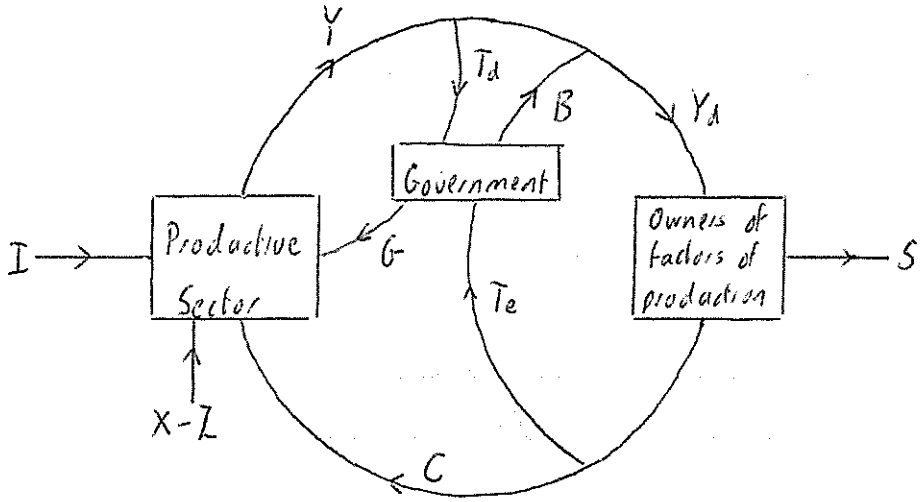
Balance of Payments

This records a countries transactions with the rest of the world. It is split int

Current account	visible trade
	invisible trade
Capital accounts	
Official financing	sale / purchase of gold and foreign currency reserves
	loan / borrow of gold and foreign currency reserves
Balancing element.	

It must sum to zero. When we speak of balance of payments being positive or negative, we implicitly exclude the official financing.
Inflow of the domestic currency is positive, outflow is negative.
A positive balance of payments leads to a stronger currency.

Model of the Economy



Y	Real gross national income at factor cost
C	Private sector expenditure on consumption
S	Savings
I	Private sector expenditure on investment
T_d	Direct taxes on factors of production
T_e	Indirect taxes on expenditure
G	Government spending on goods and services
B	Transfer payments
X	Exports (purchase by foreigners of goods and services produced domestically)
Z	Imports (domestic purchase of goods and services produced by foreigners)
Y_d	National disposable income ($= Y - T_d + B$)
O	National value added output at factor cost ($= Y$)
E	National expenditure on final goods at factor cost ($= O = Y$)

We can get simpler models by setting various of the values to zero.

Using the Model

By equating flows, we get some useful relationships

$$Y = C + I + G + X - Z$$
$$S + T_e + T_d + Z = I + G + B + X$$

The first of these is most useful, as we use it to calculate national income. This refers to a lot of different values

GDP at factor cost = Y
GDP at market prices = Y_d
GNP = GDP + net property income from abroad
NNP = GNP - reduction in asset value due to depreciation

As depreciation is hard to measure, we typically use GNP. Thus we do not deduct depreciation or investment spending when calculating it. To compensate for inflation, we usually use a GNP deflator.

We also need to make an allowance for unreported goods and services, externalities (such as pollution) and leisure time.

Keynsian Models

These take the standard model and add the assumptions

$$C = a + b Y_d$$
$$T_d = t_d Y$$

We solve the set of equations to find the equilibrium.

The variable b is called the marginal propensity to consume (out of disposable incom and is denoted MPC. The marginal propensity to consume out of national income is defined $MPC' = (1 - t_d) MPC$. This value is important because the effect of an increase in injection or leakage will be greater by a factor of $1/1 - MPC'$.

Generalising, this multiplier is $1/$ marginal propensity to withdraw out of national income, where MPW' is a combination of savings, imports and tax.

A similar concept, known as the accelleraler applies to investment. Capital stock has a long life and needs slow replacement. Thus a small drop in demand can lead to no replacement stock being needed, and a small rise in a large increase. Thus a one off shock can lead to some very volatile behaviour.

Money

There are four official definitions of money, getting successively broader

	M0	M1	M3	M4
All money	✓	✓	✓	✓
+ private sector cheque accounts		✓	✓	✓
− notes held by the banks		✓	✓	✓
+ private sector deposit accounts			✓	✓
+ private sector building society accounts				✓
− building society holdings				✓

The following example shows the difference between M0 and M4. Suppose th public keeps all assets in bank accounts with cash reserve ratios of 8%. A loan of €100 (M0) will ultimately give the banks €1250 (M4) worth of money The ratio of 12·5 is called the money multiplier.

In general the money multiplier is $\frac{1+c}{r+c}$ where c = ratio of cash to deposits and r = banks cash to deposits ratio.

People hold money for three main reasons

- Transactions (to be able to buy things when we need them)
- Precautionary (to be able to handle unexpected costs)
- Asset (because money is a less risky asset than shares, etc)

Controlling Money Supply

The quantity theory of money states that $MV = PS$, where

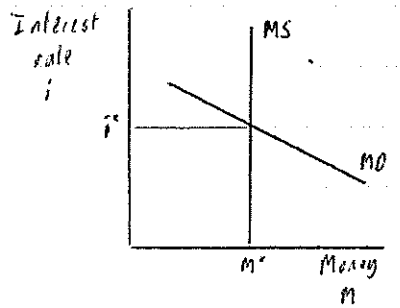
- M nominal money supplies
- V velocity of circulation
- P average price level
- Y real level of economic activity

Assuming V and Y are fixed, inflation is proportional to the money supply. Even if the assumption doesn't hold, controlling the supply is an important tool when controlling inflation. The government does this by the following means.

- Open market operations (buying and selling gilts and bills)
- Reserve requirements (forcing the banks to hold a proportion of cash)
- The discount rate (high rate discourages use and encourages cash holdings)

- Printing money (or not)
- Credit control (restricting mortgages, consumer credit, etc)

The fact that the main element in controlling money supply is the buying and selling of gilts means that there must be a link with interest rates. Indeed, we get the following diagram

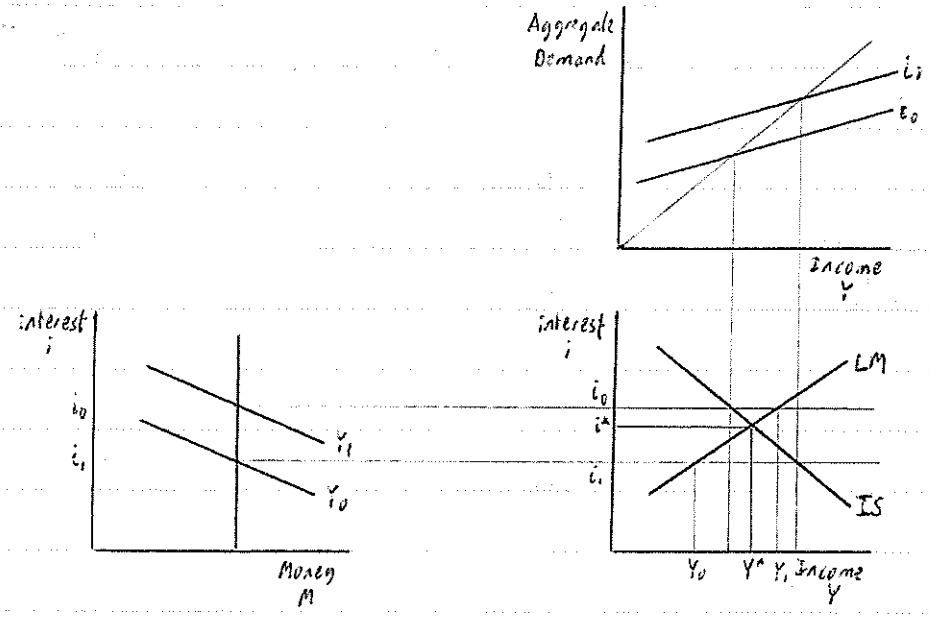


IS-LM model

To maintain equilibrium in the goods market, higher interest rates cause lower investment demand I and consumption demand C, and thus decrease the level of national income.

To maintain equilibrium in the money market, higher income causes an increase in the demand for money and thus higher interest rates.

This conflict is modelled by the IS-LM curve, giving equilibrium interest and inco



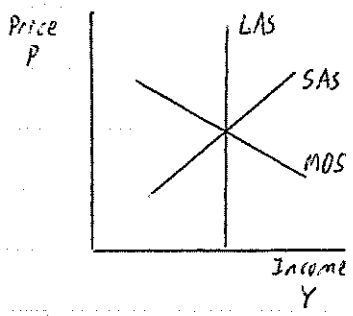
Adjustments to the aggregate demand and money supply affect the IS and LM curves respectively. Price changes cause adjustment in both. Adjustments may cause us to leave the equilibrium point in the short term but we will return there in the long term. - the return to equilibrium is called crowding out.

Other Curves

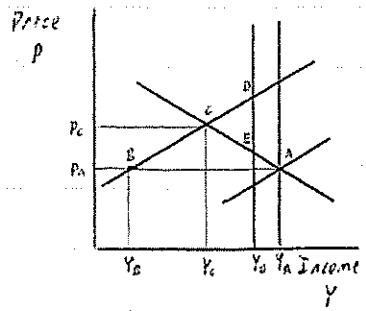
In the goods market, long term income is fixed whatever the price.
In the short term, however, increased prices mean it is profitable to employ more labour to increase output until wages catch up. This temporarily raises income.

In the money market, high prices lead to lower real money supply and lower income.

These are combined to give aggregate demand and aggregate supply curves

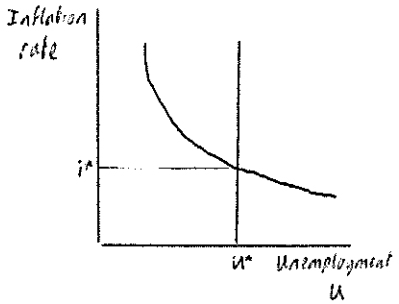


The notes describe an oil price shock in detail, but I'll just draw the diagram



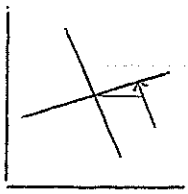
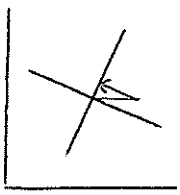
Whether we go to D or E depends on whether the government increases the money supply to accomodate the oil price rise or not.

The Phillips curve shows the relationship between inflation and unemployment. In the long run unemployment is unaffected by inflation, but in the short run money illusion and wage contracts prevents wages adjusting and cause unemployment changes.



Keynesians and Monetarists

There are two competing viewpoints in economic theory about the importance of government intervention in managing the economy

	Keynesians	Monetarists
Long term more important than short term	No	Yes
Demand management useful	Yes	No
How long do markets take to clear	Long	Short
Is money illusion a problem	Yes	No
Do recessions do damage	Yes	No
What is the effect of crowding out		
Should we use fiscal policy (taxes & spending)	Yes	No
Should we use monetary policy (interest & money sup)	Yes	Yes

Exchange Rates

These are interesting primarily when the government tries to fix them. The government may wish to do this because

- It ensures interest rates stay at the world level
- They give certainty and thus encourage foreign trade
- They can lead to lower inflation

Fixing them can be pretty damaging, including money lost selling to keep the currency in position, damping aggregate demand to keep the balance of payments balanced, having to keep interest rates balanced and the resulting problems these cause.

Following an unexpected depreciation volumes of imports and exports are little changed from before but will represent a bigger sterling amount, so balance of payments deteriorates. In the long run imports drop and exports rise so balance of payments shows an overall improvement. This is the j curve effect.