Lecture 1

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Chapter Name: Monetary policy

Today's Agenda

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1 Monetary policy

This section discusses monetary policy, which is one of the two main macroeconomic policies used to manage the domestic economy – the other is fiscal policy.

Monetary policy is concerned with controlling the money supply and/or the level of short- term interest rates in order to influence aggregate demand. It is therefore referred to as a demand-side policy.

1.1 The policy setting and role of Central Bank

In framing its monetary policy, the government has to decide the role of the central bank in carrying out monetary policy. There are three possible approaches:

- In the first, the **government both sets the policy** and **decides the measures necessary to achieve it.** Here the government would set the interest rate, with the central bank simply influencing money markets to achieve this rate. This first approach was used in the UK before 1997.

- The second approach is for the **government to set the policy targets**, but for **the central bank to be given independence in deciding interest rates**. This is the approach adopted in the UK today. The government has set a target rate of CPI inflation of 2 per cent, but then the MPC is free to choose the rate of interest.

- The third approach is for **the central bank to be given independence not only in carrying out policy, but in setting the policy target itself**. The ECB, within the statutory objective of maintaining price stability over the medium term, has decided on the target of keeping inflation below, but close to, 2 per cent over the medium term.

1.2 Control of the money supply over the medium and long term

If the government wishes to restrict monetary growth over the longer term, it could attempt to control either or both of these.

1) Banks' liquidity ratio –

The central bank could impose a statutory **minimum reserve ratio** on the banks.

Minimum reserve ratio - A minimum ratio of cash (or other specified liquid assets) to deposits (either total or selected) that the central bank requires banks to hold.

The **effect** of a minimum reserve ratio **is to prevent banks choosing to reduce their cash or liquidity ratio and creating more credit**. Minimum reserve ratios also have the effect of **reducing the bank deposits multiplier**, since, for any expansion of the monetary base, *less* credit can be created.

A **major problem with imposing restrictions of this kind is that banks may find ways of getting round them**. After all, normally banks would like to lend and customers would like to borrow.

1.2 Control of the money supply over the medium and long term

2) Public-sector deficits –

We know that government borrowing tends to lead to an increase in money supply. To prevent this, deficits must be financed by selling bonds (as opposed to bills, which could well be taken up by the banking sector, thereby increasing money supply).

However, to sell extra bonds the government will have to offer higher interest rates. This will have a knock-on effect on private-sector interest rates. The government borrowing will thus crowd out private-sector borrowing and investment.

If governments wish to reduce monetary growth and yet avoid financial crowding out, they must therefore reduce deficits.

It is partly for this reason that many governments have constrained fiscal policy choices by applying fiscal rules or agreements.

1.3 Long-term monetary control and inflation

Although there are issues with achieving **long-term control of the money supply**, there is widespread agreement that it **is important to do so**.

It is argued that in the long run – **after all adjustment**s in the economy have worked through – a **change in the quantity of money** in the economy **will be reflected in a change in the general level of prices.** But it will **not induce permanent changes in real variables such as real output or unemployment.**

This general principle, referred to as the **long-run neutrality of money.**
Long-run neutrality of money - Changes in money supply over the long run will only affect prices and not real output or employment.

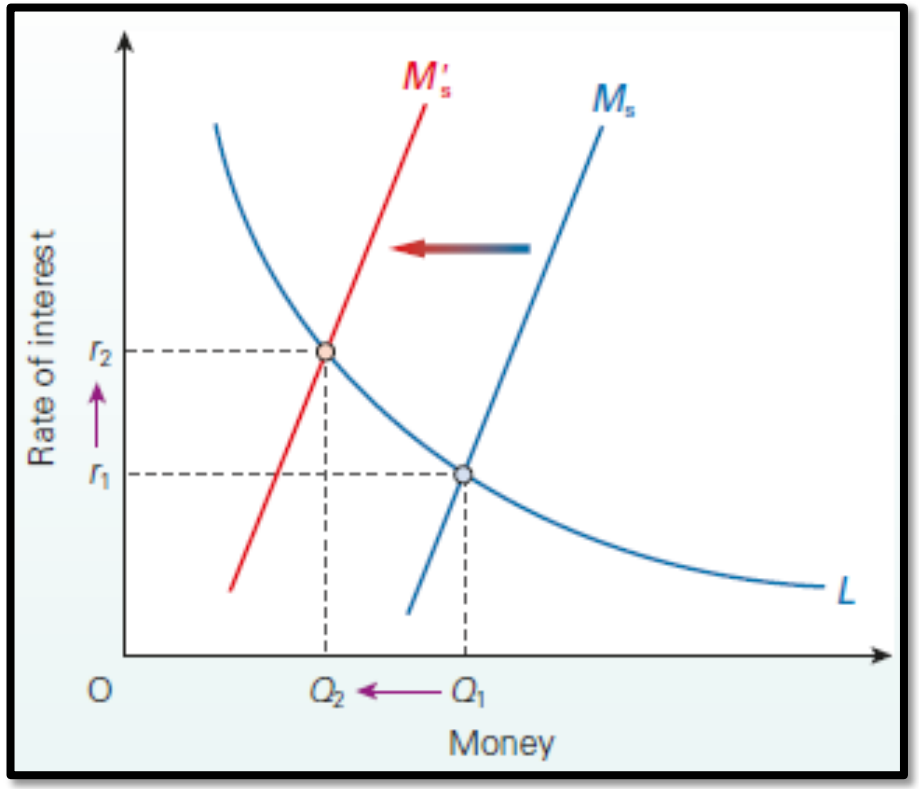
If **inflation is to be kept under control, therefore, it is important to control the supply of money**.
And if long-term control is to be achieved, it is also important not to allow excessive expansion (or contraction) of the money supply in the short term too.

1.4 The operation of monetary policy in the short term

Assume that inflation is above its target rate and that the central bank wishes to operate a tighter monetary policy in order to reduce aggregate demand and so the rate of inflation. What can it do?

To operate a tighter monetary policy, the authorities can do one of the following:

- **Reduce money supply and accept whatever equilibrium interest rate results.** Thus if money supply is reduced to *Q*2 in Figure, a new higher rate of interest, *r*2, will result.



1.4 The operation of monetary policy in the short term

- First **raise interest rates to *r*2 and then manipulate the money supply to reduce it to *Q*2**. The more endogenous the money supply is, the more this will occur automatically through banks adjusting credit to match the lower demand at the higher rate of interest and the less the central bank will have to take deliberate action to reduce liquidity.
- There is another possibility. This is to **keep interest rates low (at r1), but also reduce money supply to a level of Q2.** The **trouble here is that the authorities cannot both control the money supply and keep interest rates down without running into the problem of disequilibrium**. Since the demand for money now exceeds the supply by Q1 - Q2, some form of credit rationing would have to be applied.

2 Two broad approaches to controlling the money

There are two broad approaches to controlling the money supply:

- The **first is alter the level of liquidity in the banking system, on which credit is created**. Suppose, for example, that banks operate a rigid 10 per cent cash ratio and have just two types of asset: cash and advances. Suppose also that the authorities are able to reduce cash in banks by £1 million. With a bank multiplier of 10 (= 1/cash ratio), advances must be reduced by £9 million, and hence (broad) money supply by £10 million.
- The **second approach is to alter the size of the bank deposits multiplier, by altering the ratio of reserves to deposits**. Thus if the bank deposits multiplier can be reduced, credit will have to be reduced for any given reserve base.

2.1 Techniques to control the money supply

There are four techniques that a central bank could use to control the money supply. Assume in each case that the central bank wishes to reduce money supply.

1. Open-market operations

Open-market operations - The **sale (or purchase) by the authorities of government securities in the open market in order to reduce (or increase) money supply.**

Open-market operations (OMOs) are the most widely used of the four techniques around the world.

Open-market operations involve the sale or purchase by the central bank of government securities (bonds or bills) in the open market. These sales or purchases are not in response to changes in the level of government deficits/surpluses. Rather, they are being conducted to implement monetary policy. Hence, they are best understood in the context of an unchanged deficit

2.1 Techniques to control the money supply

2. Adjusting central bank lending to the banks

In most countries, the central bank is prepared to provide extra money to banks (through rediscounting bills, gilt repos or straight loans). If banks obtain less money in this way, they will have to cut back on lending. Less credit will be created and broad money supply will thereby be reduced.

3. Changing the method of funding the national debt

Rather than focusing on controlling the monetary base (as in the case of the above two techniques), an alternative is for the authorities to attempt to **alter the overall liquidity position of the banks.**

An example of this approach is a change by the authorities (the Debt Management Office in the UK) in the balance of **funding** the national debt. **Funding (in monetary policy) -** Where the authorities alter the balance of bills and bonds for any given level of government borrowing.

2.1 Techniques to control the money supply

4. Variable minimum reserve ratios

If banks are required to maintain a statutory minimum reserve ratio and if the central bank is free to alter this ratio, it can use it as a means of controlling the money supply.

It does this by affecting not the monetary base, but the size of the bank multiplier.

2.2 Difficulties in controlling money supply

1. Problems with monetary base control

Monetary base control - Monetary policy that focuses on controlling the monetary base (as opposed to broad liquidity).

- Banks could **hold cash in excess of the statutory minimum**. For a time, therefore, they could respond to any restriction of cash by the authorities by simply reducing their cash ratio towards the minimum, rather than having to reduce credit.
- Unless cash ratios were imposed on every single financial institution, the control of certain institutions' lending would **merely shift business to other uncontrolled institutions,** including overseas ones. Banks operate in a global market.
- Alternatively, if those banks subject to statutory cash requirements were short of cash, they could **attract cash away from the uncontrolled institutions**. The switching of business away from controlled banks is known as **disintermediation**.

2.2 Difficulties in controlling money supply

But **two major problems** with monetary base control, with or without a statutory cash ratio, are the most serious of all.

The first is that **central banks are always prepared to increase the monetary base**, through repos or rediscounting, if it is demanded. This makes it **virtually impossible to have a precise control of the monetary base.**

The second is the **size and variability of the money multiplier.**

In other words, controlling the monetary base would have a highly unpredictable effect on the money supply.

2.2 Difficulties in controlling money supply

2. Problems with controlling broad money supply

One solution to the problems of monetary base control would be for the authorities to attempt to control broader money supply directly. But as with monetary base control, there are problems with attempting to control broad money supply.

- Banks may be prepared to reduce their liquidity ratio. This is likely if they already have surplus liquidity, or if their customers are prepared to switch from sight to time accounts (for which banks require fewer cash reserves). This will involve offering higher interest rates on time accounts, and hence charging higher interest rates on bank loans. But if demand for loans is relatively insensitive to interest rate changes, this will have little effect on credit or on overall deposits.

- The use of open-market operations or funding to reduce money supply involves selling more bonds. But if potential purchasers believe interest rates will rise in the future they will hold off buying bonds now and may even attempt to sell bonds before bond prices fall. Thus the authorities may be forced into a large immediate increase in bond interest rates.

Perhaps the **biggest problem is the effect on interest rates.**

3 Techniques to control interest rates

Normally an interest rate change will be announced, and then open-market operations will be conducted by the central bank to ensure that the money supply is adjusted so as to make the announced interest rate the equilibrium one.

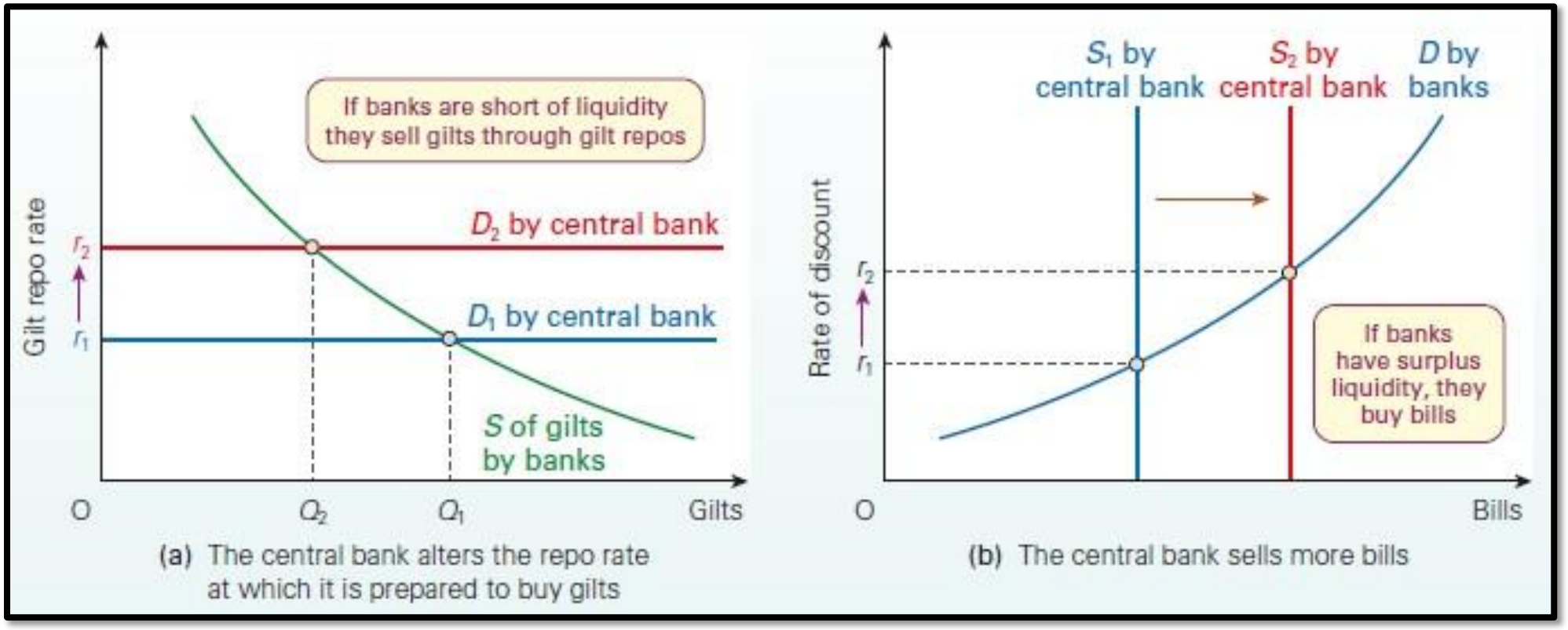
Let us assume that the central bank decides to raise interest rates. What does it do? In general, it will seek to keep banks short of liquidity. This will happen automatically on any day when tax payments by banks' customers exceed the money they receive from government expenditure.
This excess is effectively withdrawn from banks and ends up in the government's account at the central bank.

This 'shortage' can then be used as a way of forcing through interest rate changes. Banks will obtain the necessary liquidity from the central bank through gilt repos or by selling it back (rediscounting) bills.

The central bank can choose the rate of interest to charge (i.e. the gilt repo rate or the bill rediscount rate). This will then have a knock-on effect on other interest rates throughout the banking system.

3 Techniques to control interest rates

The effects can be illustrated in Figure, both parts of which assume that the central bank wishes to raise the real interest rate (the real repo or discount rate) from *r*1 to *r*2.



3.1 Problems with controlling interest rates

Even though central bank adjustment of the repo rate is the current preferred method of monetary control in most countries, it is not without its difficulties.

The **problems centre on the nature of the demand for loans**. If this demand is

(a) unresponsive to interest rate changes - If the demand for loans is inelastic, any attempt to reduce demand (e.g. from *Q*1 to *Q*2) will involve large rises in real interest rates (*r*1 to *r*2). The problem will be compounded if the demand curve shifts to the right, due, say, to a consumer spending boom

(b) unstable because it can be significantly affected by other determinants (e.g. anticipated income or foreign interest rates) - Accurate monetary control requires the authorities to be able to predict the demand curve for money. Only then can they set the appropriate level of interest rates. Unfortunately, the demand curve may shift unpredictably, making control very difficult. The major reason is *speculation*. It will be very difficult to control by controlling the rate of interest.

4 Money as an indicator of aggregate demand

Monetarists from the 1960s argued that the level of money supply determines the level of nominal aggregate demand and prices. They therefore argued in favour of setting targets for the growth of money supply.

Critics, however, argued that the level of money supply is only an indicator of the level of nominal aggregate demand (and a poor one at that). As soon as you start to control money supply, they said, the relationship between them breaks down as said by the Goodhart's law.

Goodhart's law - Controlling a symptom of a problem or only one part of the problem will not cure the problem: it will simply mean that the part that is being controlled now becomes a poor indicator of the problem

If, for example, you restrict the amount of money and yet people still want to borrow, money will simply circulate faster (the velocity of circulation (V) will rise), and hence aggregate demand may not decline.

4.1 Monetary policy in influencing the level of aggregate demand

It is **impossible to use monetary policy as a precise means of controlling aggregate demand**. It is especially weak when it is pulling against the expectations of firms and consumers, and when it is implemented too late.

However, if the authorities operate a tight monetary policy firmly enough and long enough, they should eventually be able to reduce lending and aggregate demand. But there will inevitably be time lags and imprecision in the process.

An **expansionary monetary policy is even less reliable**.

Despite these problems, changing interest rates can be **quite effective in the medium term**. After all, they can be changed very rapidly. most governments or central banks have used interest rate changes as the major means of keeping inflation and/or aggregate demand under control.

5 The IS-LM Model

The goods and money markets

There are two key markets in the economy at macroeconomic level, and that these two markets interact. The first is the goods market; the second is the money market.

Changes in one market cause changes in the other. Therefore, we need a model which allows us to combine the goods and money markets.

The traditional approach has been through a model known as the IS/LM model. The IS curve is based on equilibrium in the goods market; the LM curve is based on equilibrium in the money market.

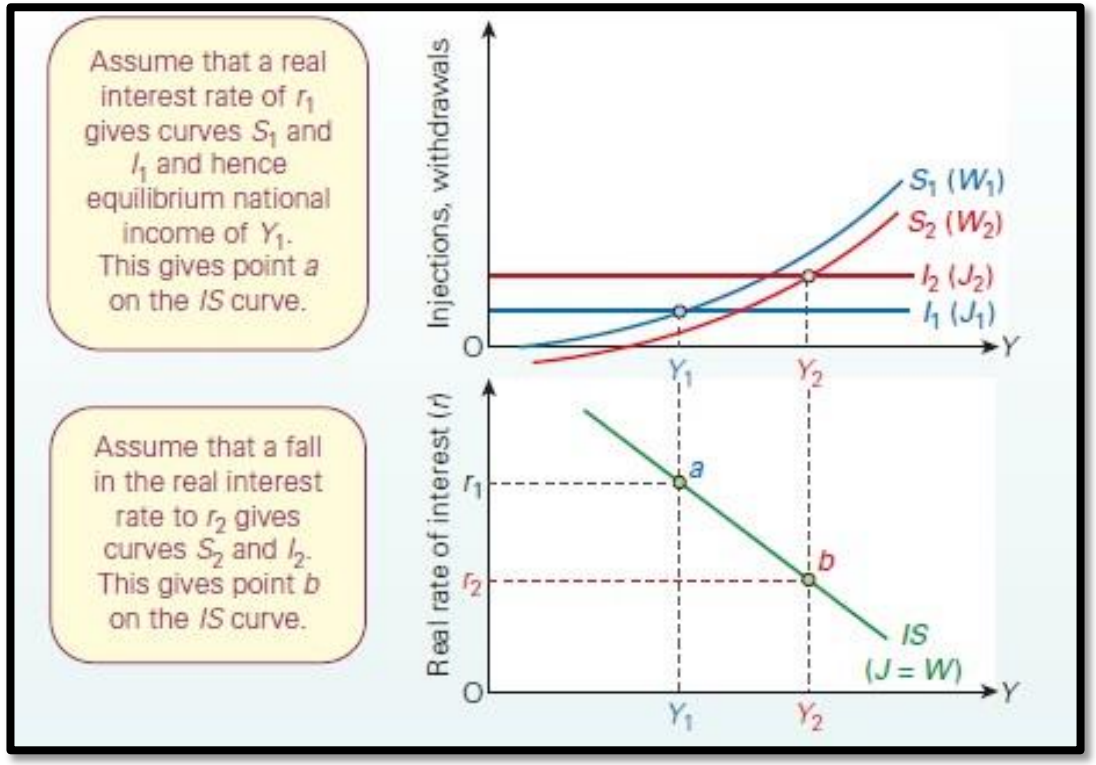
By examining the interaction of both markets we can see the implication for interest rates and output.

5.1 The IS curve

Goods market Equilibrium: Deriving the IS curve

To explain how the IS curve is derived, let us examine figure below, which as you can see is in two parts. The top part shows the familiar Keynesian injections and withdrawals diagram, only in this case, for simplicity, we are assuming that saving is the only withdrawal from the circular flow of income, and investment the only injection.

The levels of saving (S) and investment (I) are real levels and in equilibrium I = S (i.e. J = W). The bottom part of figure shows the IS curve. This shows all the various combinations of real interest rates (r) and real national income (Y) at which I = S.



5.1 The IS curve

Elasticity of IS curve

The elasticity of the IS curve depends on two factors.

1. The responsiveness of investment and saving to interest rate changes.

The more investment and saving respond to a change in the real rate of interest, the bigger will be the vertical shift in the I and S curves, and thus the bigger will be the effect on national income. The bigger the effect on national income, the more elastic will be the IS curve.

2. The size of the multiplier.

This is given by 1/mps (i.e. 1/mpw in the full model). The flatter the curve, the bigger the multiplier. The larger the value of the multiplier, the bigger will be the effect on real national income of any rise in investment and fall in saving, and the more elastic therefore will be the IS curve.

5.2 Shifts in the IS curve

A change in real interest rates will cause a movement along the IS curve.

A change in any other determinant of investment or saving, however, will shift the whole curve. The reason is that it will change the equilibrium level of real national income at any given real rate of interest.

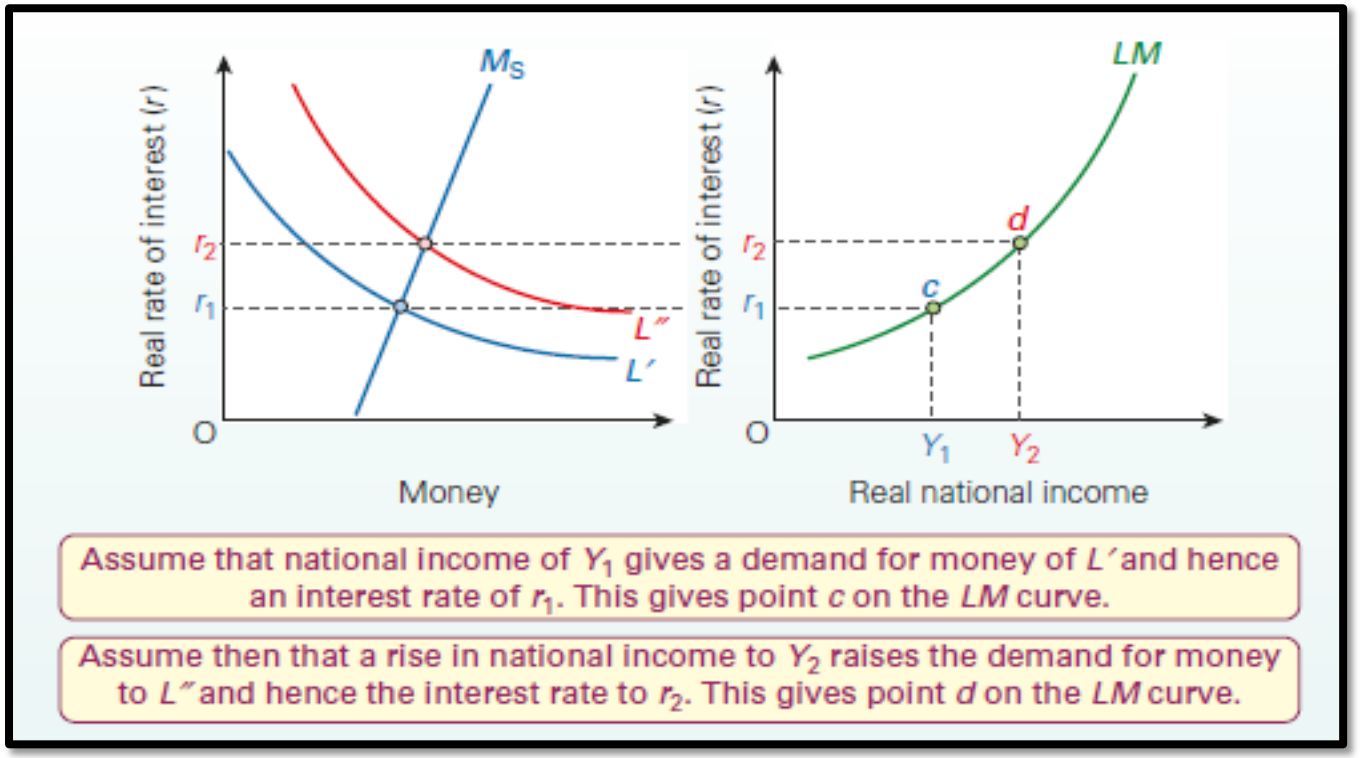
An increase in investment, other than as a result of a fall in real interest rates, will shift the IS curve to the right.

An expansionary fiscal policy that increased government expenditure on goods and services (G) or cut taxes (T) would shift the 'IS' curve (i.e. the JW curve) to the right.

5.3 The LM curve

Money market Equilibrium: Deriving the LM curve

To explain how the LM curve is derived consider figure aside. The left-hand part of the diagram is the familiar money market diagram, showing a liquidity preference (demand for money) curve (L) and a supply of money curve (M). The righthand part shows the LM curve.



5.4 Shifts in the LM curve

A change in national income will cause a movement along the LM curve to a new equilibrating interest rate.

A change in any other determinant of the demand and supply of money will shift the whole curve. The reason is that it will change the equilibrium level of interest associated with any given level of national income.

An increase in the demand for money, other than as a result of a rise in income, will shift the L curve to the right.

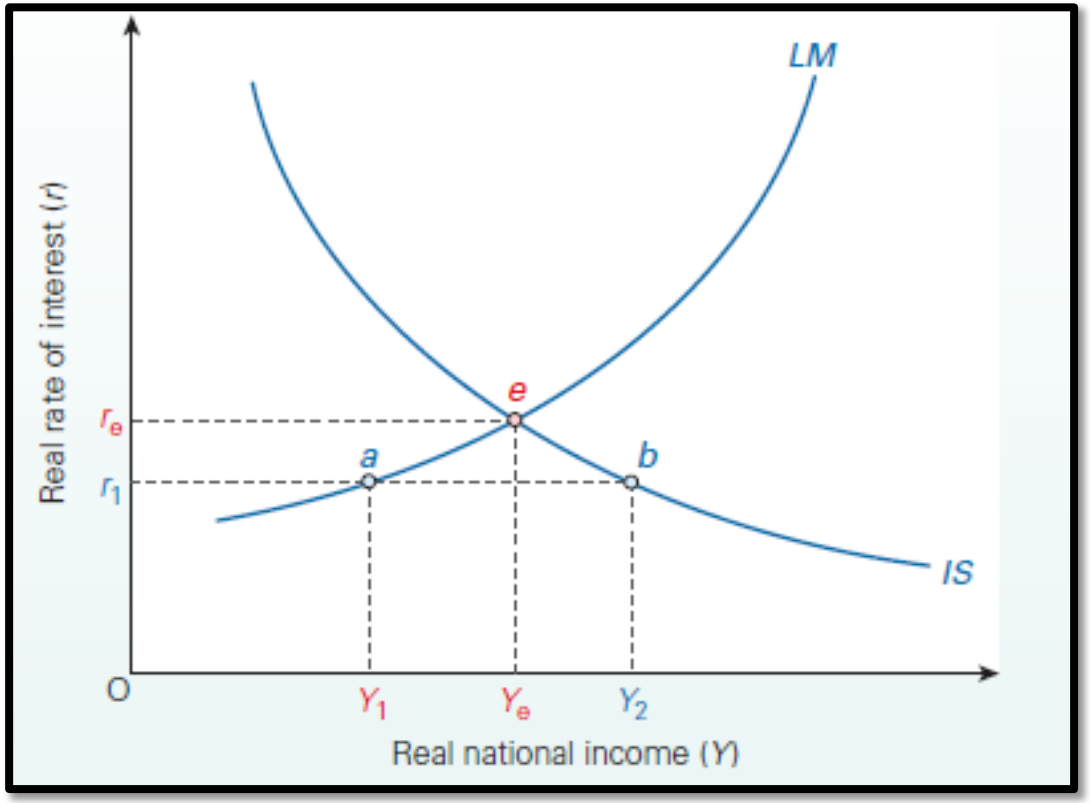
An increased supply of money by the authorities will shift the Ms curve to the right.

5.5 Equilibrium

The IS curve shows all the combinations of the rate of interest (r) and national income (Y) at which the goods market is in equilibrium. The LM curve shows all the combinations of r and Y at which the money market is in equilibrium.

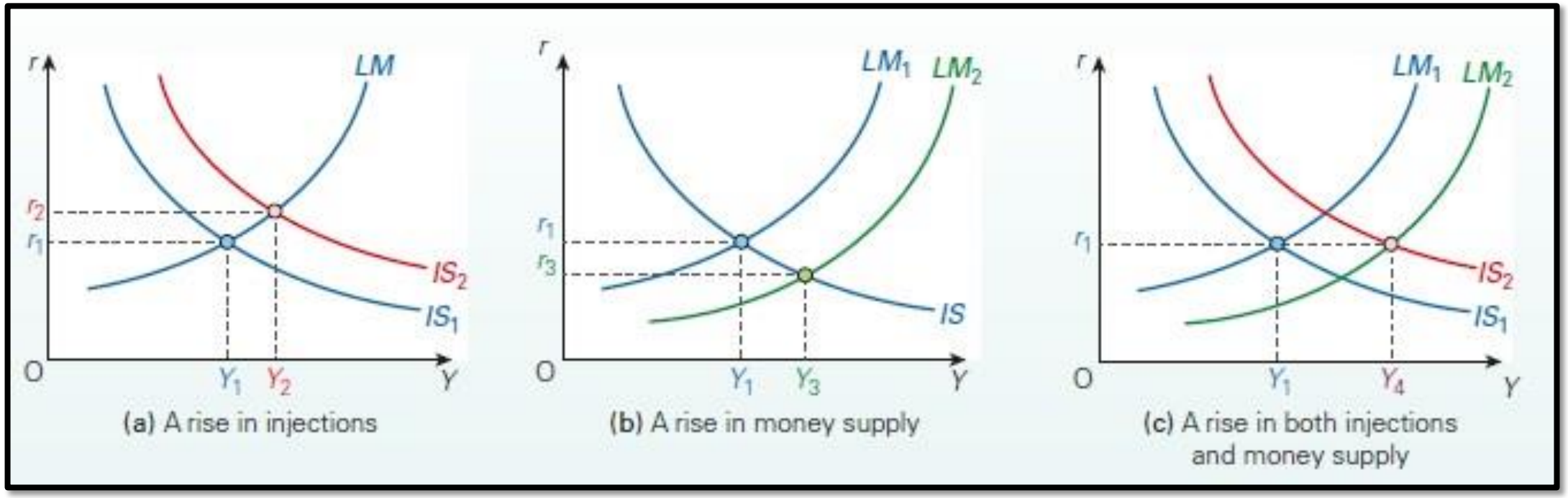
Both markets will be in equilibrium where the curves intersect.

This is at re and Ye as seen in the figure.



5.6 IS/LM analysis of changes in the goods and money markets

The diagrams help us to understand the effects of changes in goods and money markets on the equilibrium.



5.6 IS/LM analysis of changes in the goods and money markets

- A change in injections or withdrawals will shift the *IS* curve. A rise in injections will shift it to the right. This will cause a rise in both national income and the rate of interest. The steeper the *IS* curve and the flatter the *LM* curve, the bigger will be the rise in income and the smaller the rise in the rate of interest.
- A rise in money supply will shift the *LM* curve downwards. This will cause a fall in interest rates and a rise in national income. The rise in national income will be larger, the flatter is the *IS* curve and the steeper the liquidity preference curve (*L*) and hence the bigger the downward shift in the *LM* curve for any given increase in the money supply.

6 The IS-MP Model

Under inflation targeting the authorities use monetary policy to affect equilibrium in the goods market.

Therefore, the modern approach to modelling the interaction between the goods and money markets retains the *IS* curve as the *IS* curve relates to equilibrium in the goods market.

However, the *LM* curve is replaced with a 'monetary policy curve' – the *MP* curve. The *MP* curve captures the interest rate choices of central bank.

6.1 The MP curve

Deriving the MP curve

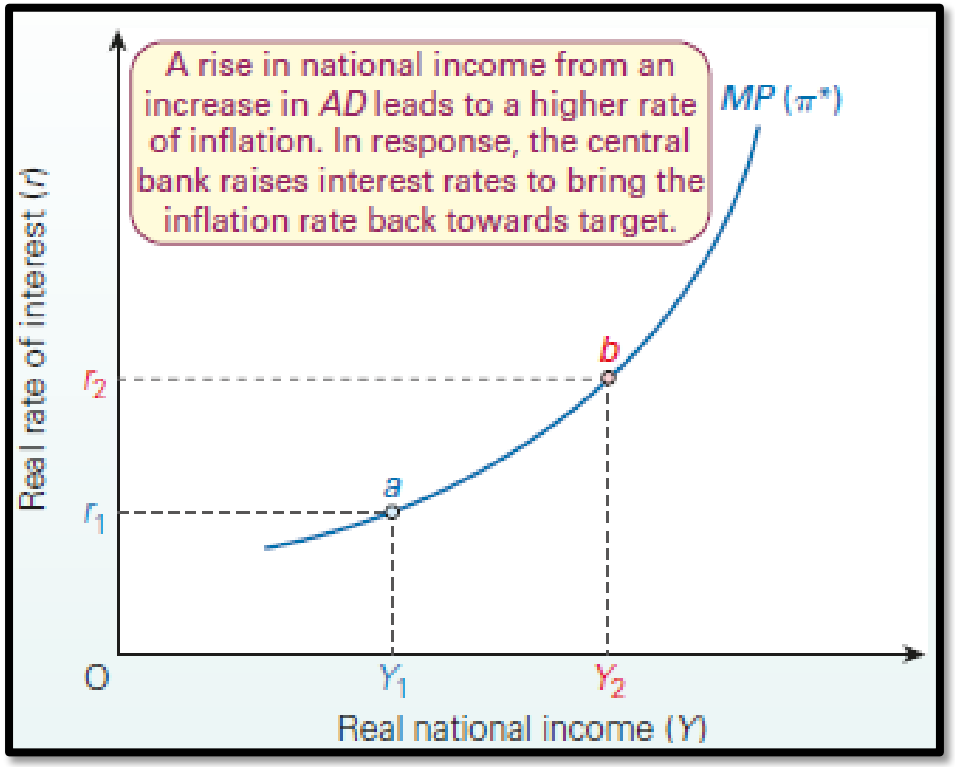
To help analyse the monetary policy (*MP*) curve consider figure. The *MP* curve is a relatively new model, developed in the context of inflation targeting by central banks

The relationship underpinning the *MP* curve can be summarised as follows:

Y ↑ → $\pi > \pi^*$ → r ↑

Y ↓ → $\pi < \pi^*$ → r ↓

where π^* is the target inflation.



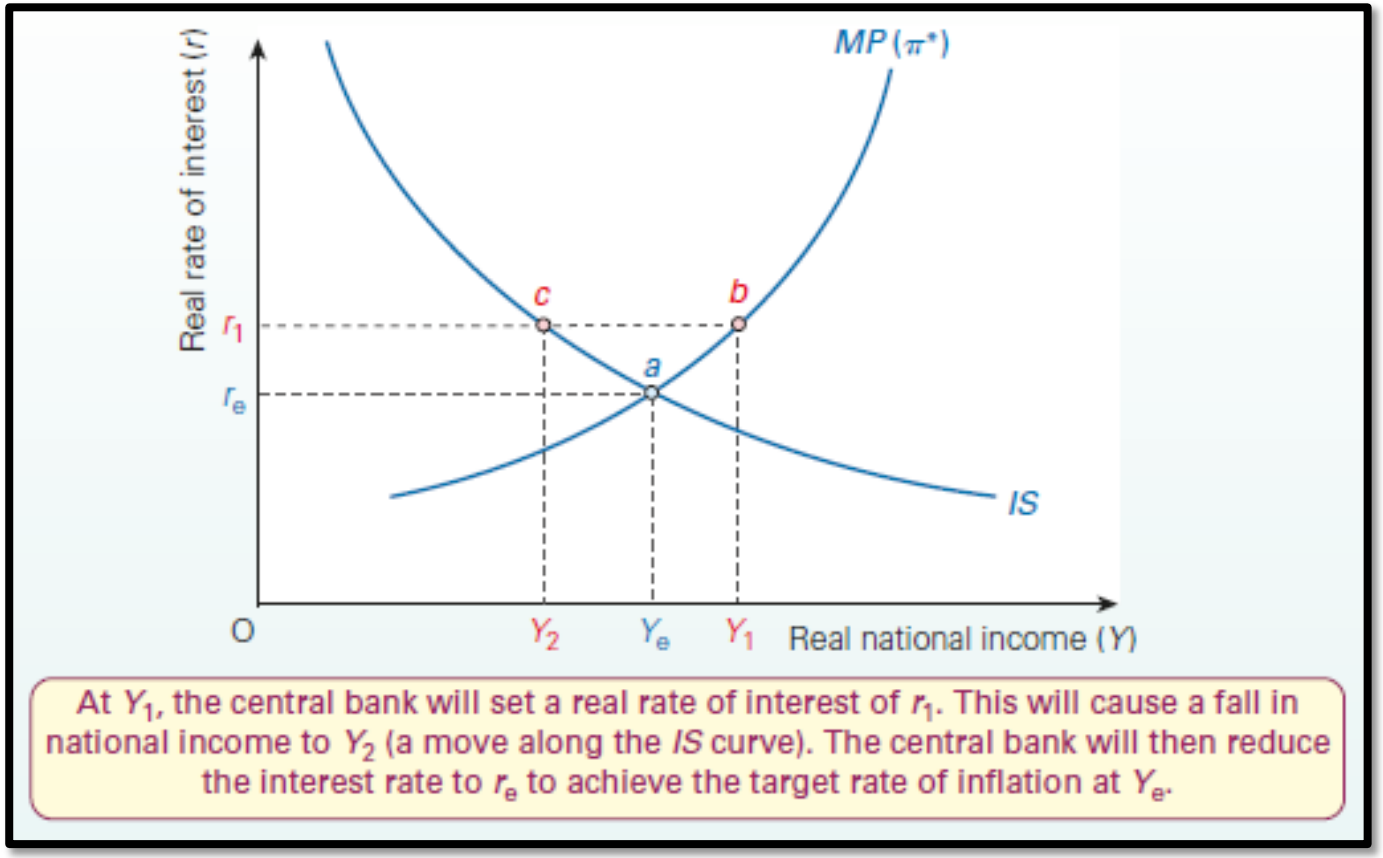
6.2 Shifts in the MP curve

Factors that would cause a shift in the *MP* curve are:

- ***Change in the target rate of inflation***. If the central bank chooses to raise the target rate of inflation, the *MP* curve will shift downwards.
- ***An inflationary shock***. If there is a cost-push inflationary shock, such as a rise in inflationary expectations, an oil price increase or a substantial rise in the minimum wage, the *MP* curve will shift upwards.
- ***Change in central bank policy***. If, instead of targeting just inflation, the central bank chooses to target national income or a combination of inflation and national income, then the *MP* curve will change shape.
- ***Change in potential national income***. Potential national income is likely to rise over time. This rise in aggregate supply is the result of increased investment, new technology, greater labour efficiency, etc. A rise in potential national income will shift the *MP* curve to the right, as a given rate of inflation will be associated with a higher level of national income.

6.3 Equilibrium

Equilibrium national income and the rate of interest are given by the intersection of the *IS* and *MP* curves. This is shown as point *a* in figure, giving equilibrium national income of *Y*e and an interest rate of *r*e.



At Y_1, the central bank will set a real rate of interest of r_1. This will cause a fall in national income to Y_2 (a move along the *IS* curve). The central bank will then reduce the interest rate to r_e to achieve the target rate of inflation at Y_e.

6.4 IS/MP analysis of changes in the goods and money markets

A shift in either curve will lead to a new equilibrium. The resulting size of the change in real national income and real interest rates will depend on the size of the shift and the shape of the other curve. The diagrams help us to understand the effects of changes in goods and money markets on the equilibrium.