INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

Subject : Macro Economics

Money and Interest Rates

What is Money?

- What do you think is money?
- What can count as money?
- What are the functions of money?

The functions of money

What items should be included in the definition of money? To answer this we need to identify the functions of money.

The **main purpose of money is for buying and selling goods, services and assets**: i.e. as a 'medium of exchange'. It also has three other important functions. Let us examine each in turn.

1) A medium of exchange

- **Medium of exchange –** Something that is acceptable in exchange for goods and service. 'Money' is any such medium.
- To be a suitable physical means of exchange**, money must be light** enough to carry around, must come in a **number of denominations**, large and small, and must **not be easy to forge**.
- Alternatively, money must be **in a form that** enables it to **be transferred indirectly through some acceptable mechanism.**

The functions of money

2) A means of storing wealth

- People need a means whereby the fruits of today's labour can be used to purchase goods and services in the future.
- **People need to be able to store their wealth**: they want a **means of saving**. Money is one such medium in which to hold wealth. It can be saved.

3) A means of evaluation

- Money allows the value of goods, services or assets to be compared. The value of goods is expressed in terms of prices, and prices are expressed in money terms. Money also allows dissimilar things, such as a person's wealth or a company's assets, to be added up.
- Similarly, a country's GDP is expressed in money terms. **Money thus serves as a 'unit of account'.**

The functions of money

4) A means of establishing the value of future claims and payments

- People often want to **agree today the price of some future payment.**
- For example, workers and managers will want to agree the wage rate for the coming year. Firms will want to sign contracts with their suppliers specifying the price of raw materials and other supplies.
- **Money prices are the most convenient means of measuring future claims.**

What should count as money?

What items, then, should be included in the definition of money? Unfortunately, there is no sharp borderline between money and non-money.

The answer is: it depends on how narrowly money is defined.

- Narrowest definition
  - Includes just cash (i.e. notes and coins)

- Broader definitions
  - Includes cash (i.e. notes and coins)

  - Include various types of bank account, and still include various financial assets as well

The supply of Money

If money supply is to be monitored and possibly controlled, it is obviously necessary to measure it. But what should be included in the measure? (https://www.youtube.com/watch?v=r5eFObOFcME&ab_channel=MarginalRevolutionUniversity)

- **Monetary base** (or 'high-powered money') – Notes and coin outside the central bank.

But the monetary base gives us a very poor indication of the effective money supply, since it excludes the most important source of liquidity for spending: namely, bank deposits.

The supply of Money

The problem is **which deposits to include**. We need to answer three questions:

- Should we include just **sight deposits, or time deposits** as well?
- Should we include just **retail deposits, or wholesale deposits** as well?
- Should we include just **bank deposits, or building society** (savings institution) deposits as well?

The huge changes in the financial sector throughout the world. has led to a blurring of the distinctions between different types of account. It has also made it very easy to switch deposits from one type of account to another.

- The **most usual measure** that countries use for money supply **is broad money**, which in most cases includes both time and sight deposits, retail and wholesale deposits, and bank and building society (savings institution) deposits.

The creation of credit: the simplest case

Bank deposits multiplier The number of times greater the expansion of bank deposits is than the additional liquidity in banks that causes it: 1/l (the inverse of the liquidity ratio).

(Money Multiplier:: https://www.youtube.com/watch?v=93_Va7I7Lgg&ab_channel=MarginalRevolutionUniversity)

The creation of credit: the real world

In practice, the creation of credit is not as simple as this. There are three major complications.

1) **Banks' liquidity ratio may vary**

Banks may choose a different liquidity ratio. At certain times, banks may decide that it is prudent to hold a **bigger proportion of liquid assets.**

On the other hand, there may be an upsurge in consumer demand for credit. Banks may be very keen to grant additional loans and thus make more profits, even though they have acquired no additional assets. They may simply go ahead and expand credit, and accept a **lower liquidity ratio.**

The creation of credit: the real world

2) Banks may not operate a simple liquidity ratio

The fact that banks hold a number of fairly liquid assets, such as short-term loans to other banks on the inter-bank market, bills of exchange and certificates of deposit, makes it **difficult to identify a simple liquidity ratio.**

Can we assume that **near money** (Highly liquid assets (other than cash).) assets, such as bills, are just as liquid as cash? If we assume that they are not, then has the liquidity ratio fallen? If so, by how much?

Banks **do not see** a clear-cut **dividing line between liquid and non-liquid assets.**

In practice, therefore, the size of the bank deposits multiplier will vary and is thus difficult to predict in advance.

The creation of credit: the real world

3) Some of the extra cash may be withdrawn by the public

If extra cash comes into the banking system, and as a result extra deposits are created, part of them may be held by households and non-bank firms (known in this context as the **non-bank private sector**) as cash outside the banks.

Non-bank private sector – Households and non-bank firms. In other words, everyone in the country other than banks and the government (central and local).

In other words, some of the **extra cash leaks out of the banking system**.

This will result in an overall multiplier effect that is smaller than the full bank deposits multiplier. This overall multiplier is known as the **money multiplier**.

It is defined as the **rise in total money supply expressed as a proportion of the rise in the monetary base** that caused it: **ΘMs/ ΘMb** (where Ms is total broad money supply and Mb is the monetary base).

What causes money supply to rise?

Money supply can change for a number of reasons. We consider five sets of circumstances which can cause the money supply to rise.

1) Central bank action

The central bank may decide that the **stock of money is too low** and that this is **keeping up interest rates** and **restraining spending in the economy.** In **such circumstances**, it may choose to **create additional money.**

2) Banks choose to hold a lower liquidity ratio

If banks collectively choose to hold a **lower liquidity ratio,** they will **have surplus liquidity**. The banks have tended to choose a lower liquidity ratio over time because of the increasing use of direct debits and debit card and credit card transactions.

What causes money supply to rise?

3) The non-bank private sector chooses to hold less cash

Households and firms may choose to hold less cash. Again, the reason may be a greater use of cards, direct debits, etc. This means that a greater proportion of the cash base will be held as deposits in banks rather than in people's wallets, purses or safes outside banks. The **extra cash deposits allow banks to create more credit.**

The next two reasons for an expansion of money supply are reasons why the monetary base itself might expand

What causes money supply to rise?

4) An inflow of funds from abroad

(explaining in terms of sterling)

When sterling is used to pay for UK exports and is deposited in UK banks by the exporters, credit can be created on the basis of it. This leads to a multiplied increase in the domestic money supply.

The money supply will also expand if depositors of sterling in banks overseas then switch these deposits to banks in the UK. This is a direct increase in the money supply.

In an open economy like the UK, movements of sterling and other currencies into and out of the country can be very large, leading to large fluctuations in the money supply

What causes money supply to rise?

5) A public-sector deficit

A public-sector deficit is the **difference between public-sector expenditure and public-sector receipts**. To finance a public-sector deficit, the government has to borrow money by selling interest-bearing securities (Treasury bills and gilts).

The precise amount of money the public sector requires to borrow in any one year is known as the **public-sector net cash requirement (PSNCR)**.

Public-sector net cash requirement (PSNCR) – The (annual) deficit of the public sector, and thus the amount that the public sector must borrow.

In general, the **bigger the deficit**, the **greater** will be the **growth in the money supply**.

The flow-of-funds equation

Flow of funds (FOF) are financial accounts that are used to track the net inflows and outflows of money to and from various sectors of a national economy. Macroeconomic data from flow of funds accounts are collected and analyzed by a country's central bank.

Flow-of-funds equation – The various items making up an increase (or decrease) in money supply. This shows the components of a change in money supply (Θ*M*s).

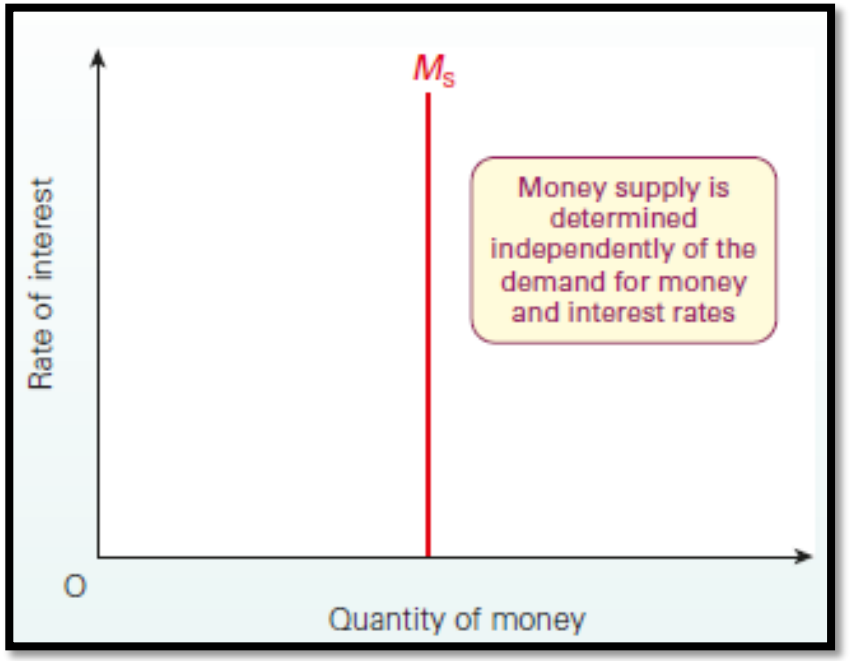
It consists of four items (or 'counterparts' as they are known). The following flow-of-funds equation is the one most commonly used in the UK, (we consider the same for our understanding)

equals	PSNCR	(Item 1)
minus	Sales of public-sector debt to (or plus purchases of public-sector debt from) the non-bank private sector	(Item 2)
plus	Banks' and building societies' sterling net lending to the UK private sector	(Item 3)
plus	External effect	(Item 4)

Exogenous money supply

We now try to understand the relationship between money and interest rates.

- **Exogenous money supply –** Money supply that does not depend on the demand for money but is set by the authorities. Simple monetary theory often assumes that the supply of money is totally independent of interest rates.
- It is assumed to be determined by the government or central bank ('the authorities').
- The supply of money curve: exogenous money supply curve is given as:

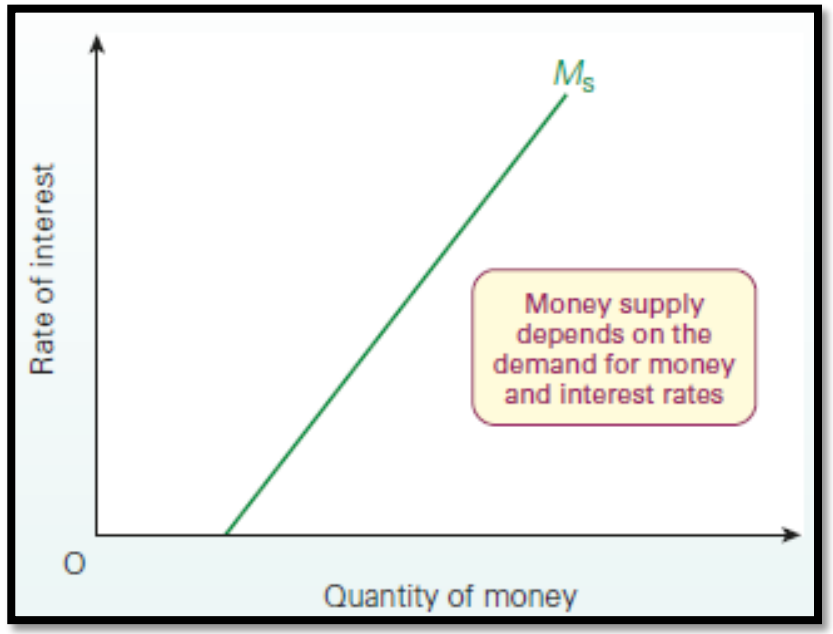


Endogenous money supply

In practice, however, even if narrow money were to be tightly controlled by the central bank (which it is not), it would be very hard to have a precise control of broad money.

More complex models, therefore, and especially Keynesian models, assume that money supply **is endogenous.**

- **Endogenous money supply –** Money supply that is determined (at least in part) by the demand for money.
- The argument is that **higher money demand** will result in **higher interest rates** and in **higher levels of money supplied.** The result is an **upward sloping money supply curve,** as in Figure besides.



Reasons for Upward sloping curve

The reasons for this are as follows:

- **Increases in money supply** may occur **as a result of banks expanding credit in response to the demand for credit.** This assumes that banks have surplus liquidity in the first place, or are happy to operate with lower liquidity, or can increase liquidity through secondary marketing of otherwise illiquid assets, or can obtain liquidity from the central bank through repos. Higher demand for credit will drive up interest rates, making it more profitable for banks to supply more credit.

- Higher interest rates may encourage depositors to **switch their deposits from sight accounts** (earning little or no interest) **to time accounts**. Since money is less likely to be **withdrawn quickly from time accounts**, banks may feel the **need to hold less liquidity**, and therefore may decide to **increase credit**, thus **expanding the money supply.**

- **Higher interest rates attract deposits from overseas**. **This increases the money supply** to the extent that the Central Bank does not allow the exchange rate to appreciate in response.

The demand for Money

Up until now we saw the supply side for money. Now we drive our attention towards the demand for money.

The demand for money refers to the desire to hold money: to keep your wealth in the form of money, rather than spending it on goods and services or using it to purchase financial assets such as bonds or shares.

It is usual to distinguish three reasons why people want to hold their assets in the form of money.

Note that we are talking here about broad money:

The motives for holding money

1) The transactions motive

Since money is a medium of exchange, it is **required for conducting transactions**. But since people receive money only at intervals (e.g. weekly or monthly) and not continuously, they require to hold balances of money in cash or in current accounts.

2) The precautionary motive

Unforeseen circumstances can arise, such as a car breakdown. Thus individuals often hold some additional **money as a precaution.** Firms too keep precautionary balances because of uncertainties about the timing of their receipts and payments. If a large customer is late in making payment, a firm may be unable to pay its suppliers unless it has spare liquidity.

The motives for holding money

3) The speculative or assets motive

Certain firms and individuals who **wish to purchase financial assets**, such as bonds, shares or other securities, may prefer to wait if **they feel that their price is likely to fall**. In the **meantime, they will hold money balances instead**. This **speculative demand** can be quite high when the price of securities is considered certain to fall. Money when used for this purpose is a means of temporarily storing wealth.

Similarly, people who will require foreign currency at some time in the future (people such as importers, holidaymakers, or those thinking of investing abroad or in foreign securities) may prefer to wait before exchanging pounds into the relevant foreign currencies if they believe that the sterling price of these currencies is likely to fall (the pound is likely to appreciate).

The transactions plus precautionary demand for money: L1

- The transactions plus precautionary demand for money is termed L1. 'L' stands for **liquidity preference**: that is, the desire to hold assets in liquid form.
- Money balances held for these two purposes are called **active balances.**

What determines the size of *L*1?

The transactions plus precautionary demand for money: L1

- The major determinant of *L*1 is **nominal national income**. The higher people's money income, the greater their (nominal) expenditure and the bigger their demand for active balances.
- The **frequency with which people are paid** also affects *L*1. The less frequently they are paid, the greater the level of money balances they will require to tide them over until the next payment.
- The **rate of interest** has some effect on *L*1, albeit rather small. At high rates of interest, people may choose to spend less and save more of their income, e.g. by buying shares. The effect is likely to be bigger on the precautionary demand: a higher interest rate may encourage people to risk tying up their money.
- Other determinants of *L*1 include **the season of the year**: people require more money balances at Christmas, for example.
- Also, any other **factors that affect consumption will affect *L*1**.

The speculative (or assets) demand for money: L2

- The **speculative demand for money** balances is termed ***L*2.**
- Money balances held for this purpose are called **idle balances.**

People who possess wealth, whether they are wealthy or simply small savers, have to decide the best form in which to hold that wealth.

In making these decisions, people will have to weigh up the relative advantages and disadvantages of the various alternative assets. Assets can be compared according to two criteria: liquidity and the possibility of earning income.

The **more liquid an asset** is, the **lower is likely to be the income earned from holding it**.

There are **three major determinants of the speculative demand for money**. Let us examine each in turn

Determinants of the speculative demand for money

1) The rate of interest (or rate of return) on assets

In terms of the operation of money markets, this is the **most important determinant**. The **higher the rate of return** on assets, such as shares and bonds, the **greater the opportunity cost of holding money** and therefore the **lower the speculative demand for money.**

2) Expectations of changes in the prices of securities and other assets

If people believe that **share prices** are about to **rise rapidly** on the stock market, they will **buy shares** and **hold smaller speculative balances of money**. If they think that share prices will fall, they will sell them and hold money instead.

If, the **rate of interest is high, then L2 is likely to be low**. To take advantage of the high rate of return on securities, people buy them now instead of holding on to their money.

The **inverse relationship** between the rate of interest and **L2 gives a downward-sloping curve.**

Determinants of the speculative demand for money

3) ***Speculative demand and the exchange rate***

In an open economy where large-scale movements of currencies across the foreign exchanges take place, expectations about **changes in the exchange rate** are a **major determinant.**

If people believe (suppose in UK) that the pound is likely to appreciate, they will want to hold sterling until it does appreciate. If, however, people believe that it will be a slow rise over time, they will want to buy sterling assets (such as government bonds) rather than money, since such assets will also earn the holder a rate of interest.

The introduction of the '**foreign exchange dimension**' into our analysis will have **two effects on the *L2* curve.** First, the **curve will become more elastic**. If the rate of interest is low and is thought likely to rise, the speculative demand is likely to be very high.

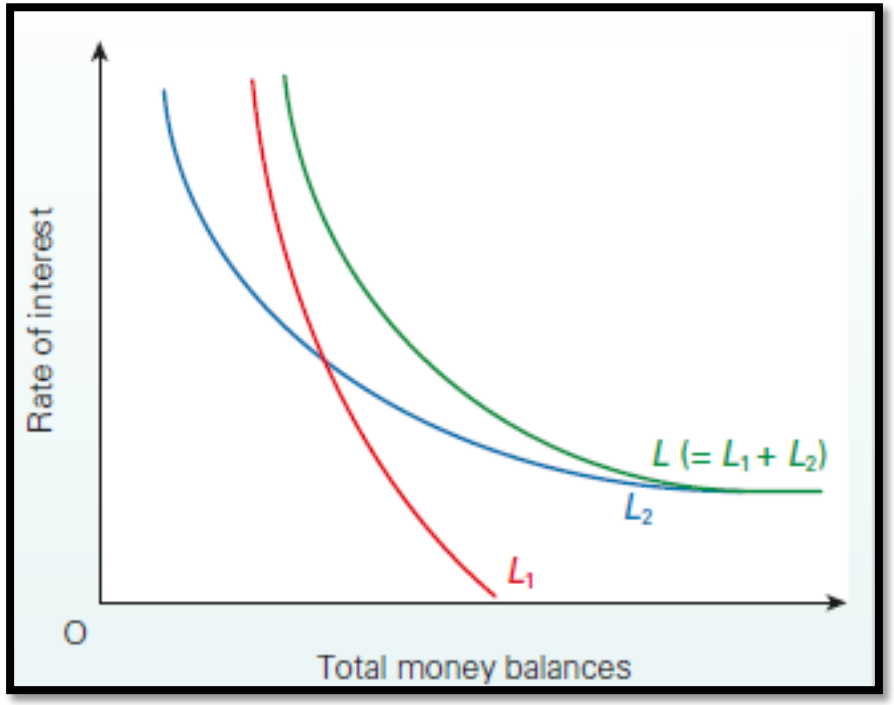
Second, the **curve will become more unstable**. Expectations of changes in the exchange rate do not just depend on current domestic interest rates but on various international factors. If any of these factors cause people to expect a lower exchange rate, the speculative demand for money will fall.

The total demand for money: L1 + L2

The figure shows the total demand for money balances (*L*).

This is found by the **horizontal addition of curves *L*1 and *L*2.**

This curve is known as the **'liquidity preference curve'** or simply **the demand for money curve.**



Additional effects of expectations

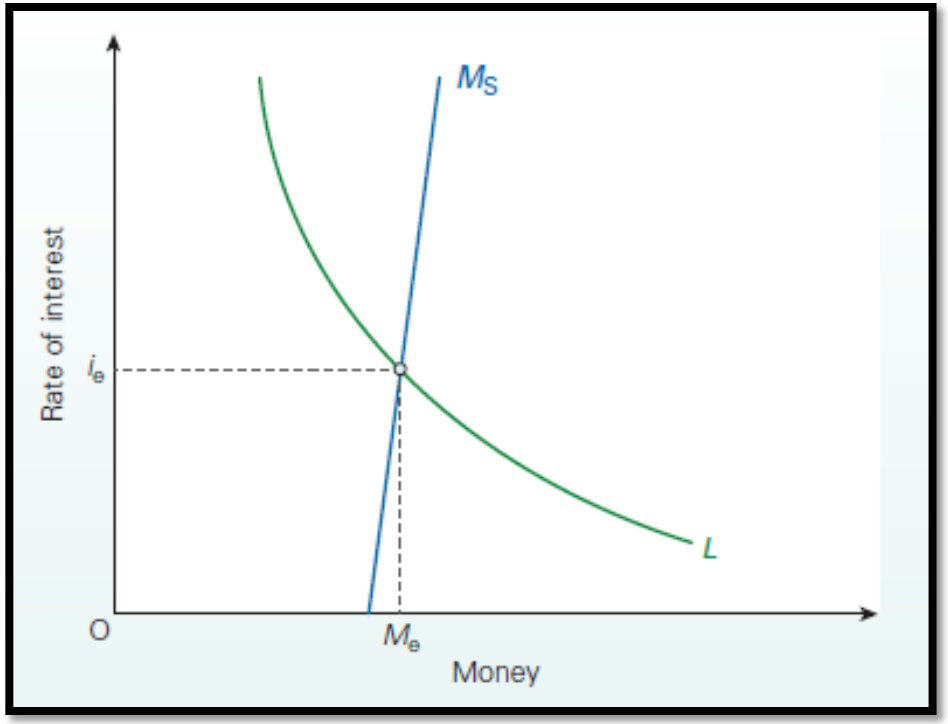
We have talked about expectations and their importance in determining the speculative demand for money. There are two other ways (other than ones we saw earlier) in which expectations can influence the demand for money, and make it more unstable.

- **Expectations about prices**. If people expect prices to rise, they may reduce their money balances and purchase goods and assets now, before prices do rise. This will tend to shift L to the left.

- **Expectations of interest rate levels over the longer term.** If people come to expect that interest rates will normally be higher than they used to be, then any given interest rate will seem lower relative to the 'normal' rate than it used to be. People will be more inclined to hold speculative balances of money in anticipation of a rise in interest rates. This will tend to shift L upwards

Equilibrium in the money market

- Equilibrium in the money market is where the demand for money (L) is equal to the supply of money (Ms).
- This equilibrium is achieved through changes in the nominal rate of interest (i).
- In the figure below, equilibrium is achieved with a nominal rate of interest i_e and a quantity of money M_e



Effects of changes

- If the rate of interest were above *i.e.*, people would have money balances surplus to their needs. They would use these to buy assets. This would drive up the price of these assets and drive down the rate of interest. As the rate of interest fell, so there would be a contraction of the money supply (a movement down along the *M*s curve) and an increase in the demand for money balances, especially speculative balances (a movement down along the liquidity preference curve). The interest rate would go on falling until it reached *i.e.*. Equilibrium would then be achieved.

- Similarly, if the rate of interest were below *i.e.*, people would have insufficient money balances. They would sell securities, thus lowering their prices and raising the rate of interest until it reached r_e. A shift in either the *M*s or the *L* curve will lead to a new equilibrium quantity of money and rate of interest at the new intersection of the curves

- In practice, there is no one single rate of interest. Equilibrium in the money markets, therefore, will be where demand and supply of each type of financial asset separately balance

Equilibrium in the foreign exchange market

- **Changes in the money supply also affect the foreign exchange market**. In a free foreign exchange market, equilibrium will be achieved by changes in the exchange rate. Assume that the money supply increases. This has three direct effects:

- Part of the **excess money balances will be used to purchase foreign assets**. This will therefore lead to an **increase in the supply of domestic currency** coming on to the foreign exchange markets.

- The excess supply of money in the domestic money market will **push down interest rates**. This will **reduce the return on domestic assets** below that on foreign assets. This, like the first effect, will lead to an increased demand for foreign assets and thus an increased supply of the domestic currency on the foreign exchange market. It will also reduce the demand for domestic assets by those outside the country, and thus **reduce the demand for the domestic currency.**

- **Speculators** will anticipate that the higher supply of the domestic currency will cause the exchange rate to depreciate. They will therefore **sell domestic currency and buy foreign currencies before the expected depreciation takes place.**

- The effect of all three is to cause the exchange rate to depreciate.

The section Coming Up!

What's included in this section

- The interest rate transmission mechanism
- The exchange rate transmission mechanism
- The portfolio balance effect

In this section we examine the impact on the economy of changes in money supply and interest rates: how they affect aggregate demand and how this, in turn, affects national income and prices.

We consider the transmission mechanisms by which a change in the money supply affects output and prices. There are two transmission mechanisms (through interest rates and through the exchange rate)

Two mechanisms

Two principal means by which a rise in money supply can cause a rise in aggregate demand are the

interest rate transmission mechanism and the

exchange rate transmission mechanism.

We start with the interest rate transmission mechanism.

The interest rate transmission mechanism

It shows the process by which changes in interest rates, following a change in the money supply, can affect aggregate demand.

❖ Difference between the realised and the perceived real rate of interest

To understand the analysis, first consider the explanation below.

- The **realised ('ex post')** real rate of interest (*r*) **received on savings** or **paid on borrowing is the nominal (actual) interest rate (*i*) *less* the rate of inflation (π).**

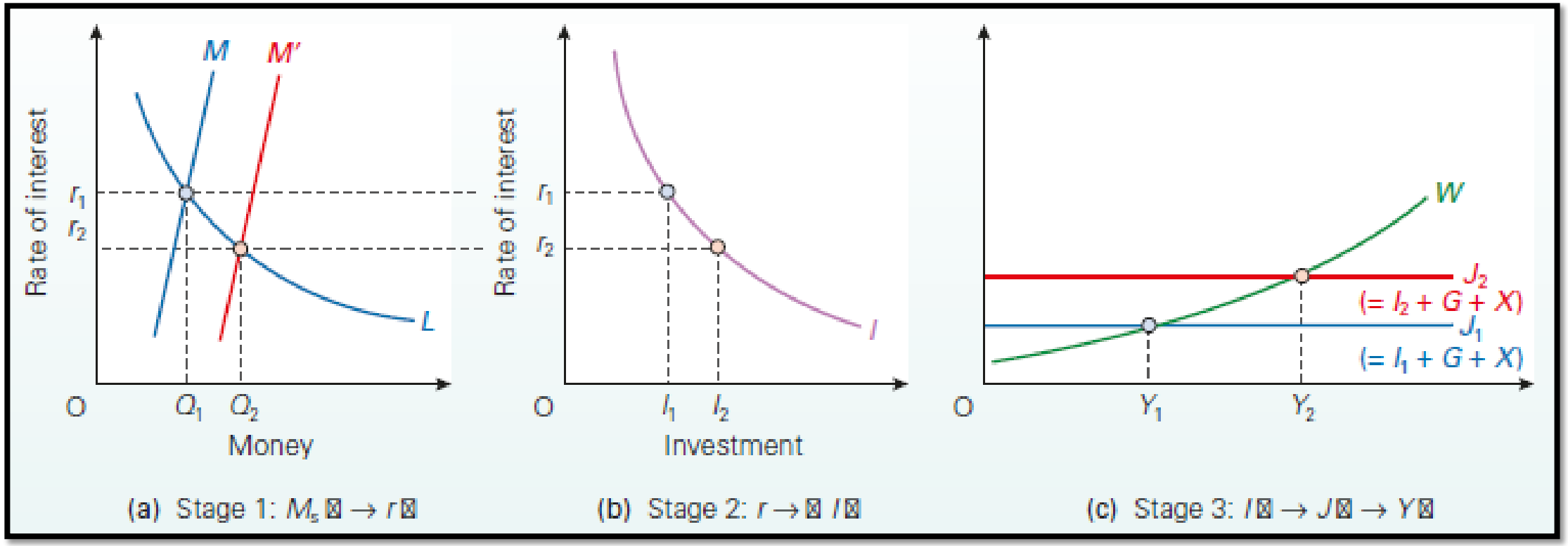
However, for savers and borrowers it is the future rate of inflation that is relevant in their decision making. Of course, future inflation rates cannot be known with certainty and, instead, people must form *expectations* of inflation.

- Hence, the **perceived real interest rate** when the decision is made **('ex ante') is the nominal interest rate (i) less the expected rate of inflation (π^e).**

The interest rate transmission mechanism

We assume in the following analysis of the short term that prices are constant and that the expected rate of inflation is zero. Therefore, a change in real interest rates is equivalent to that in nominal interest rates.

The Figure below allows us to analyse the interest rate transmission mechanism in more detail. It is a three-stage process.



The interest rate transmission mechanism

1. Money market and interest rates (stage 1) –

Figure (a) shows the money market. The horizontal axis shows real money balances (the real purchasing power of money); the vertical axis shows the real interest rate (*r*). With the economy's price level held constant, an increase in nominal money supply increases the supply of real balances (*M*): e.g. from *M* to *M'*. This, in turn, leads to a surplus of real money balances at the initial equilibrium real interest rate *r*1, and hence a fall in the real rate of interest from *r*1 to *r*2.

2. Interest rates and investment (stage 2) –

Figure (b) shows the relationship between real investment levels (*I*) and the real rate of interest. A fall in the real rate of interest from *r*1 to *r*2 leads to a rise in investment (and any other interest-sensitive expenditures) from *I*1 to *I*2.

The interest rate transmission mechanism

3. Investment and national income (stage 3) –

Figure (c) is the Keynesian withdrawals and injections diagram. With no change in the economy's price level, a rise in investment leads to a full multiplied rise in real national income from *Y*1 to *Y*2. If saving fell, there would also be a downward shift in the *W* line, which would further amplify the effects on real national income and national output from the fall in the real rate of interest.

The overall effect of a change in money supply on national income will depend on the size of the effect in each of the three stages. This will depend on the shapes of the curves in each of the three diagrams and whether they are likely to shift.

Problems with stage 1: the money–interest link

An interest-elastic demand for money

If demand for money is interest elastic, the demand-for money curve (the liquidity preference curve, *L*) will be relatively flat and may even be infinitely elastic at some minimum interest rate.

This is the point where everyone believes interest rates cannot go any lower and sooner or later will rise, and therefore no one wants to buy bonds. People simply hold the additional money as idle balances.

The additional money will be lost in **liquidity trap**

Liquidity trap – The absorption of any additional money supply into idle balances at very low rates of interest, leaving aggregate demand unchanged.

Problems with stage 1: the money–interest link

An unstable demand for money.

Another problem is that the liquidity preference curve (*L*) is unstable. People hold speculative balances when they anticipate that interest rates will rise (security prices will fall).

But it is not just the current interest rate that affects people's expectations of the future direction of interest rates. Many factors could affect such expectations.

Thus the *L* curve can be highly volatile.

With an unstable demand for money, it is difficult to predict the effect on various interest rates of a change in money supply.

Problems with stage 2: the interest rate–investment link

An interest-inelastic investment demand

Investment, it was argued, depends on confidence in future markets. If confidence is high, firms will continue to invest even if interest rates are high. They can always pass the higher costs on to the consumer. If confidence is low, firms will not invest even if interest rates are low and borrowing is cheap. Evidence seemed to confirm the interest inelasticity of investment demand.

An unstable investment demand.

Investment is notoriously volatile. It is sensitive to a multitude of factors other than the rate of interest, which means that the investment curve can shift erratically

The exchange rate transmission mechanism

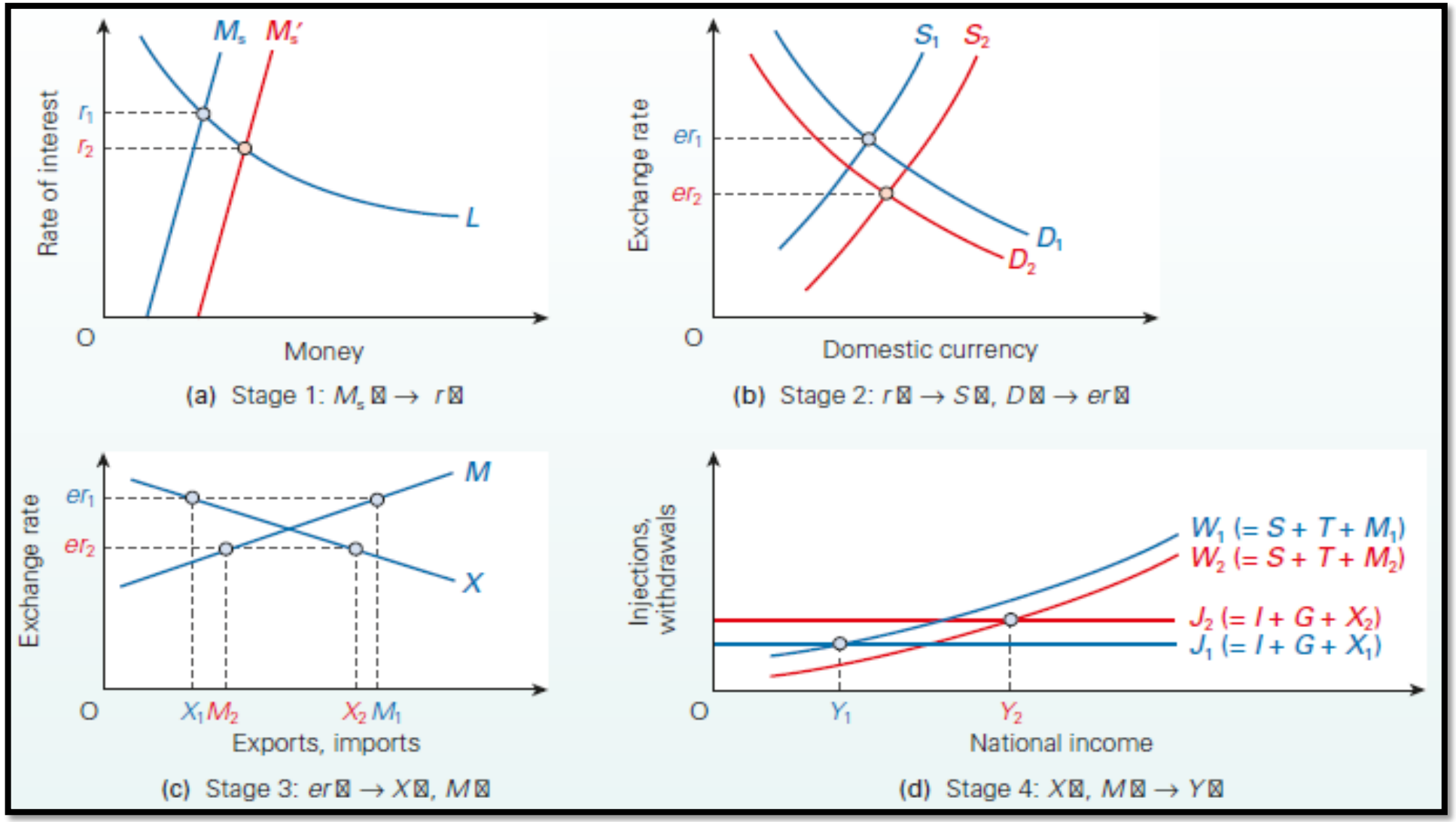
A second transmission mechanism is the ***exchange rate transmission mechanism***. This is illustrated in Figure below. (next slide)

This mechanism **backs up the interest rate mechanism**. It includes the **exchange rate as an intermediate variable between changes in the money supply and changes in aggregate demand.**

The figure shows that there are four stages in this exchange rate transmission mechanism.

We continue to assume that the economy's price level is constant in the short term and that the expected rate of inflation is 'anchored' at zero

The exchange rate transmission mechanism



The exchange rate transmission mechanism

1. Money market and interest rates (stage 1) –

In Figure(a), a rise in money supply causes a fall in domestic interest rates from *r*1 to *r*2.

2. Interest rates and foreign exchange market (stage 2) –

In Figure (b), the fall in domestic interest rates leads to an increased outflow of short-term finance from the country as people demand more foreign assets instead. There will also be a reduced inflow, as depositors seek to take advantage of relatively higher interest rates abroad. The supply of the domestic currency on the foreign exchange market rises from *S*1 to *S*2 and the demand falls from *D*1 to *D*2. This causes a depreciation of the exchange rate from *er*1 to *er*2.

The exchange rate transmission mechanism

3. *Exchange rates and net exports (stage 3) –*

In figure (c), the depreciation of the exchange rate causes a rise in demand for exports (*X*), since they are now cheaper for people abroad to buy (there is a movement down along the *X* curve). It also causes a fall in demand for imports (*M*), since they are now more expensive (there is a movement up along the *M* curve).

4. Net exports and national income (stage 4) –

In Figure (d), the rise in exports (an injection) and a fall in imports (a withdrawal) will cause a multiplied rise in national income. The equilibrium level of real national income rises from *Y*1 to *Y*2.

Strength of the exchange rate transmission mechanism

- **Stage 1 will tend to be more powerful in a more open economy.** The liquidity preference curve will tend to be less elastic because, as interest rates fall, people may fear a depreciation of the domestic currency and switch to holding other currencies. Just how strong stage 1 will be depends on how much people think the exchange rate will depreciate.
- **Stage 2 is likely to be very strong indeed**. Given the openness of international financial markets, international financial flows can be enormous in response to interest rate changes.
- **Stage 3 may be rather limited in the short run** as the demand and supply of both imports and exports may be relatively inelastic in the short run. Given time, however, consumers and firms may be more responsive and the effects on imports and exports correspondingly larger. However, the size of the effect depends on people's expectations of exchange rate movements.
- **Stage 4 is the familiar multiplier**, only this time triggered by a change in imports and exports.

The overall effect via the exchange rate transmission mechanism can still be quite strong, but the precise magnitude is usually highly unpredictable

The portfolio balance effect

Money can also impact on the economy through a process of 'portfolio adjustment': a mechanism that was stressed by monetarists.

If money supply increases, people will have more money than they need to hold. They will spend this surplus. Much of this spending will go on goods and services, thereby directly increasing aggregate demand:

$M_s \uparrow \rightarrow M_s > M_d \rightarrow$ AD $\uparrow$

The theoretical underpinning for this is given by the **theory of portfolio balance.**

Portfolio balance - The balance of assets, according to their liquidity, that people choose to hold in their portfolios.

The portfolio balance effect

- If **money supply expands**, people may find themselves holding more money than they require: their **portfolios are unnecessarily liquid**.
- Some of this money will be **used to purchase financial assets,** and **some to purchase goods and services.**
- **As more assets are purchased, this will drive up their price.** This will effectively reduce their 'yield'. For bonds and other financial assets, this means a reduction in their rate of interest.
- For goods and services, this means a reduction in their marginal utility/price ratio: **a higher level of consumption will reduce their marginal utility and drive up their price.**
- The **process will stop when a balance has been restored** in people's portfolios.
- In the **meantime**, there will have been **extra consumption** and hence a **rise in aggregate demand.**

Section further

What's included in this section

- The monetary effects of an increase in injections
- Crowding out

This section examines the effect of an increase in injections on the money market. The link here is the effect of an increase in injections (and hence national income) on the demand for money and hence interest rates.

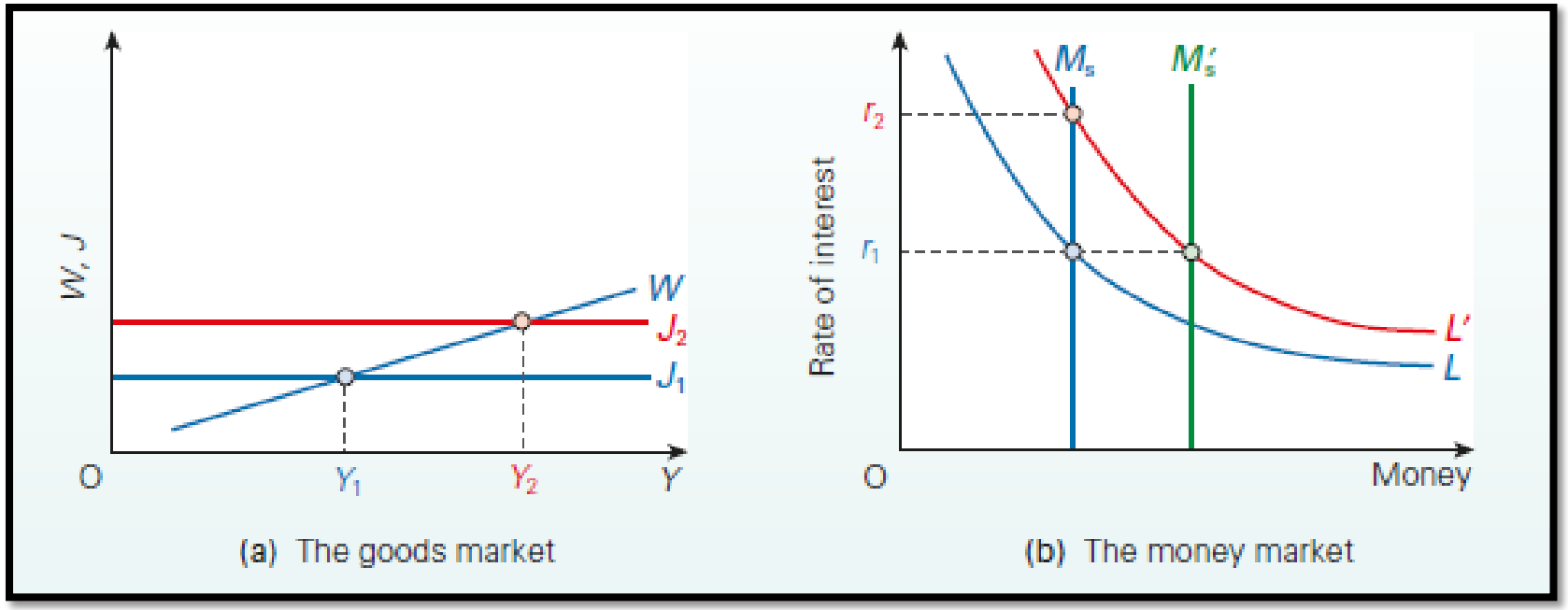
The monetary effects of an increase in injections

Let us assume that business confidence grows and that, as a result, the level of investment increases. Let us also assume that there is a given quantity of real money balances in the economy and, further, that prices are constant in the short term.

Will the rise in investment lead to a full multiplier effect on national income?

The monetary effects of an increase in injections

The effect of the rise in investment is illustrated in Figure. In Figure (a), the rise in investment leads to a rise in injections to *J*2. Other things being equal, the real level of national income would rise to *Y*2. But this increase in real national income also leads to a rise in the transactions demand for money. The rise in demand for real money balances leads to the demand-for-money curve in Figure (b) shifting from *L* to *L'*.



The monetary effects of an increase in injections

The effect of an increase in injections on national income if:

1. **Money supply is fixed –**

If the central bank does not wish to allow the real value of the economy's money supply to rise, the higher demand for money will force it to raise interest rates to *r*2.

The effect of higher real interest rates is to reduce the level of investment. The overall rise in injections will be smaller than the rise from *J*1 to *J*2.

Also net saving (i.e. saving minus borrowing) will rise as the higher real interest rate acts as both an incentive for households to save and a disincentive for them to borrow. This causes an upward shift in the *W* curve.

The result is that the real level of national income will not rise as far as *Y*2. In the extreme case, there would be no rise in real national income at all.

The monetary effects of an increase in injections

2. The central bank allows the money supply to increases in response to the increase in the demand for money –

If, however, the central bank responds to the increase in investment by expanding the real money supply to *M*s, there will be no change in the real rate of interest and hence no dampening effect on either the volume of investment or consumption.

Crowding out

Another example of the monetary constraints on expansion in the goods market is the phenomenon known as ***financial crowding out.***

Financial crowding out – Where an increase in government borrowing diverts money away from the private sector.

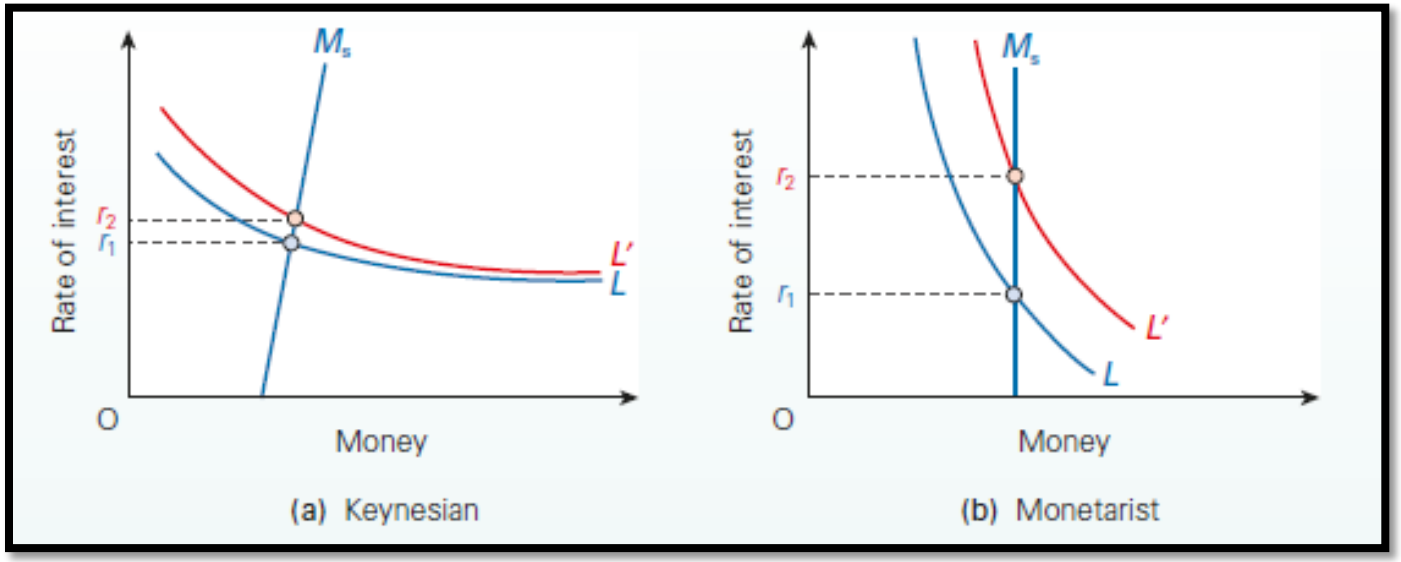
- To illustrate the effects, assume that previously the government has had a balanced budget, but that now it chooses to expand the level of government expenditure without raising additional taxes. As a result, it **runs a budget deficit (*G* > *T*).**
- But this deficit will have to be **financed by borrowing**. This increased borrowing will lead to an increase in the money supply if it is financed by sales of government debt to financial institutions, especially debt with shorter maturity.
- Alternatively, if it is **financed by selling bills or bonds** outside the banking sector, there will be no increase in the money supply.

The extent of crowding out

1. The responsiveness (elasticity) of the demand for money to a change in interest rates.

If the demand is relatively elastic, the increase in demand, represented by a horizontal shift in the liquidity preference curve will lead to only a small rise in real interest rates. If, however, the demand is relatively inelastic the same horizontal shift will lead to a bigger rise in real interest rates.

Keynesians generally see the liquidity preference curve as being more elastic than do monetarists and new classical economists



The extent of crowding out

2. The responsiveness (elasticity) of investment to a change in interest rates.

Keynesians argue that investment is relatively unresponsive to changes in real interest rates. People are likely to be affected by the state of the market for their product than by interest rates. Therefore, the rise in demand for money arising from an expansionary fiscal policy will have only a small effect on interest rates and an even smaller effect on investment. Little or no crowding out takes place.

Monetarists and new classical economists, however, argue that investment is relatively responsive to changes in interest rates. They argue that interest rates will rise significantly and that there will be a severe effect on investment. Crowding out is substantial.