

A2 – ECONOMICS (9708)

MACRO

CHAPTER 3

Money, Interest Rate Determination & Monetary Policy

Topics

Topic 1: Money and the Credit Multiplier

Topic 2: Liquidity Preference Theory

Topic 3: Loanable Fund Theory

Topic 4: Quantity Theory of Money

Topic 5: Monetary Transmission Mechanism

TOPIC 1: MONEY AND THE CREDIT MULTIPLIER

1. MONEY AND THE MODERN ECONOMY

Lecture 1

Term	Description
1. Money Supply	This is the quantity of money in circulation in the economy.
2. Liquidity	The extent to which an asset can be converted to cash without the holder incurring a cost.
3. Monetary Base	These comprise of all the notes and coins in circulation
4. Narrow Money	This is the money in forms that can be used as a medium of exchange, generally notes, coins, and certain balances held by banks.
5. Broad Money	Broad money is a term which includes narrow money along with retail deposits with monetary financial institutions.
6. Central Bank	A bank to the government, performing a range of functions, which may include issue of coins and bank notes, acting as banker to commercial banks and regulating the financial system using the monetary policy.

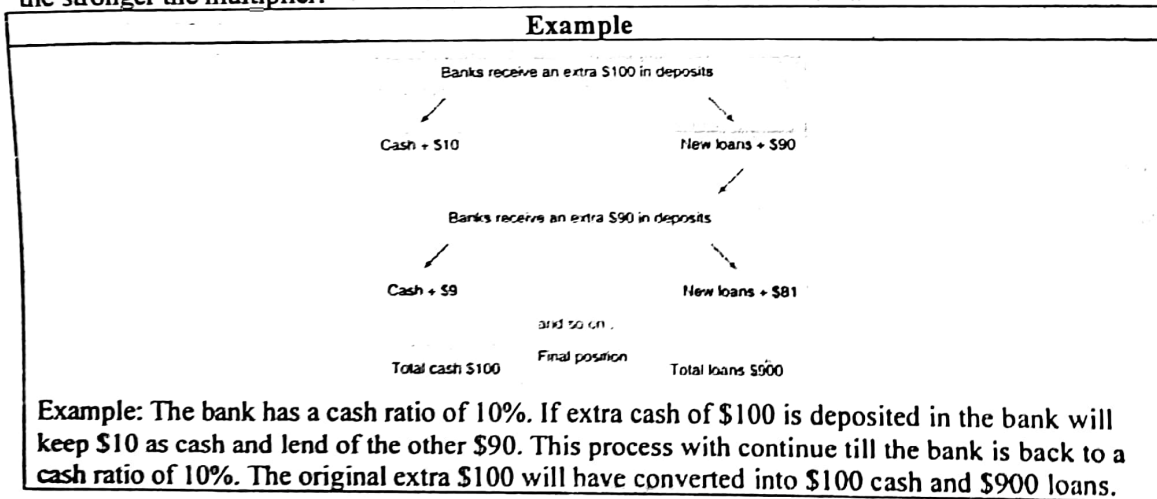
2. CREDIT MULTIPLIER

Definition | Credit Multiplier: An increase in the amount of money in the economy has a multiplied effect on the amount of credit created by the banks. This is because commercial banks accept deposits from customers and issue loans with that money. This is how banks make profit. The way in which they undertake lending has an impact on the quantity of money. Commercial banks know that it is unlikely that all their customers will want to withdraw their money simultaneously so they will lend of some of the additional deposits to borrowers who are likely to undertake expenditure on goods or services. As their expenditures work their way back into the banking system, the commercial banks will find that they can lend out even more and the process continues.

$$\text{Credit Multiplier} = \frac{1}{\text{Cash Ratio}}$$

Note: Cash Ratio is the amount of cash the bank holds in liquid form. The smaller the cash ratio the stronger the multiplier.

Example



TOPIC 2: LIQUIDITY PREFERENCE THEORY

Definition | Liquidity Preference Theory: This is Keynesian view of interest rate determination. They believe that interest rates are determined by the total demand for money and its interaction with the supply of money. This theory helps us understand why people demand money. For this theory we make TWO assumptions that households possess wealth in only two assets, bonds and cash.

— **Bonds:** These are debt instruments, so firms can borrow money by issuing them. People subscribing bonds are entitled to a periodic interest payment, usually at a pre-determined interest rate. The owner gets his principal amount back once the bond matures. Bonds are thus illiquid i.e. they cannot be converted into another asset conveniently but are profitable since bond holders receive interest payments.

— **Cash:** Cash doesn't guarantee interest payment but is liquid and allows flexibility in use as a medium of exchange.

Note: Market interest rates move inversely with the market value of a fixed interest rate bond. Assuming a bond is issued and subscribed at an annual interest rate of 6% and increase in the market interest rate to 7% at a later date forces initial subscribers to get rid of these bonds, which now sell at a reduced price. On the other hand, decreased market interest rates render older bonds with higher fixed interest rates more attractive hence increasing their market value.

Interest Rate ↑ Price of Bonds Low ↓
Interest Rate ↓ Price of Bonds High ↑

1. DEMAND FOR MONEY

Individuals demand money for **THREE** reasons:

1. Transaction motives
2. Precautionary motives
3. Speculative motives

1. Transaction motives

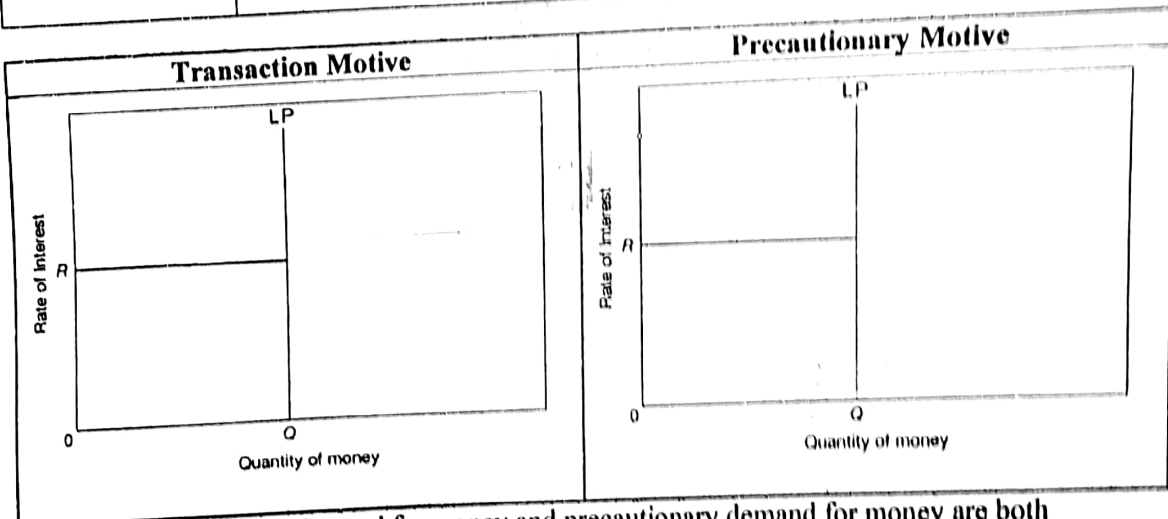
Definition: Transaction motives shows demand for money for regular and routine consumers and business needs. Consumers need it to buy goods and services for day to day transactions like buying food, shelter clothing. Whereas firms need to for buy raw material, pay salaries, pay utilities etc.

2. Precautionary motives

Definition: Precautionary motive is the demand for money arising due to unexpected and emergency requirements. A change in market conditions for example, may delay sales of firms due or debtors did not pay the firm. Hence the firms needs money in this time to continue operations. Individuals tend to demand money in case of emergencies example, unexpected health care expense, sudden increase in prices etc.

Factors that shift the Demand for Money curve
 Demand for transaction motive and precautionary motive is the active portion of money demand. Expected to be used immediately – hence it does NOT depend on the interest rate. However it depends on the following factors:

Factor	Description
1. Income Level	Consumers with higher incomes and businesses with sales turnover are likely to demand money for transaction and precautionary motives. Income \uparrow Qd for Money \uparrow Income \downarrow Qd for Money \downarrow
2. Price Level	At higher prices, households and firms have to demand more money for their routine and emergencies requirements as a prices are not stable so they need reserve cash in case the their a sudden price hike. Price Level \uparrow Qd for Money \uparrow Price Level \downarrow Qd for Money \downarrow
3. Credit cards money substitutes	Financial innovators like ATM, credit cards decrease the popularity of money. As people prefer to keep plastic money and carry less cash with them. More credit cards \uparrow Qd for Money \downarrow Less credit cards \downarrow Qd for Money \uparrow
4. Frequency of money	Workers that receive money on a monthly basis demand more money than those getting it weekly. Increased frequency and hence a smaller interval between two payments decreases the need to keep cash. Frequency \uparrow Qd for Money \downarrow Frequency \downarrow Qd for Money \uparrow



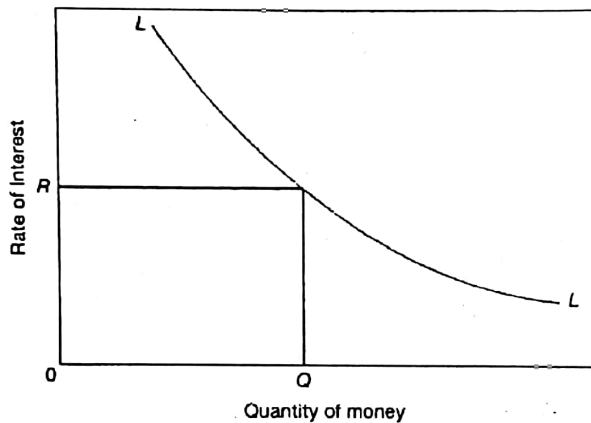
Note: Both transaction demand for money and precautionary demand for money are both insensitive to the interest rate. Hence a perfectly inelastic curve.

3. Speculative motives

Definition: Certain households and firms wish to purchase financial assets (bonds) may prefer to wait if they feel that their price is likely to change. Demand for speculative motives moves inversely with interest rates. At higher interest rates bonds are thought to be undervalued and household's covert their liquid assets into bonds. These households demand less money where interest rates are high. Money demanded for speculative motives is passive or idle since this part of liquidity is not likely to be used in the near future.

Interest rate is low \rightarrow Less Opp. cost of holding cash \rightarrow Price of bonds would be high \rightarrow People keep cash instead of bonds \rightarrow Qd for money \uparrow

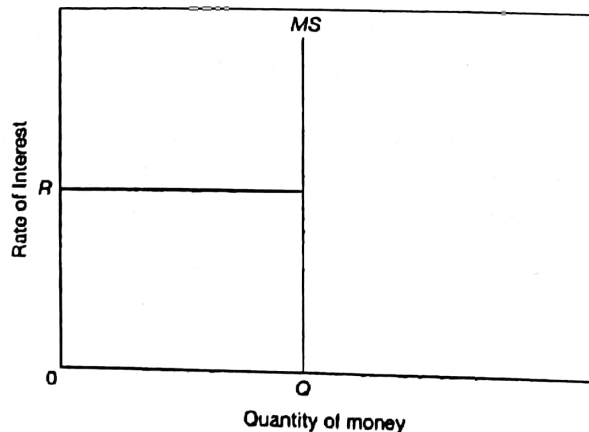
Interest rate is high \rightarrow High Opp. cost of holding cash \rightarrow Price of bonds would be low \rightarrow People keep bonds instead of cash \rightarrow Qd for money \downarrow



Note: When we add all three curves (transaction, precautionary and speculative we get the combined demand curve for money. The shape of the added curve would be the same as the speculative demand for money curve.

2. SUPPLY OF MONEY

According to Keynes the money supply is controlled by the central bank and is totally interest inelastic. In other words the supply of money would be perfectly inelastic curve, completely indifferent to the interest rate.

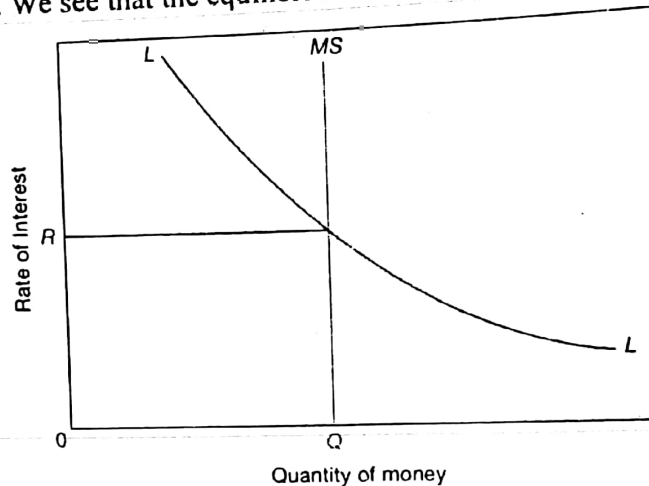


3. EQUILIBRIUM INTEREST RATE

Definition: Equilibrium interest rate is determined by the intersection of demand and supply for money.

$$M_d = M_s$$

The diagram below shows the downward sloping demand curve for money and the perfectly inelastic supply curve. We see that the equilibrium is established at R.



— **Interest Rate < Demand for money:** At the interest rate below R, that demand for money exceeds the supply hence people tend to sell bonds to overcome the shortage of cash. Increased supply of bonds lowers the market value of bonds and increases the market interest rates to the equilibrium point.

— **Interest Rate > Demand for money:** At the interest rate above R, that demand for money is less than the supply and people buy bonds to utilize the excess cash that they have. Increased demand for bonds raises their market value and lowers the market interest rates to the equilibrium point.

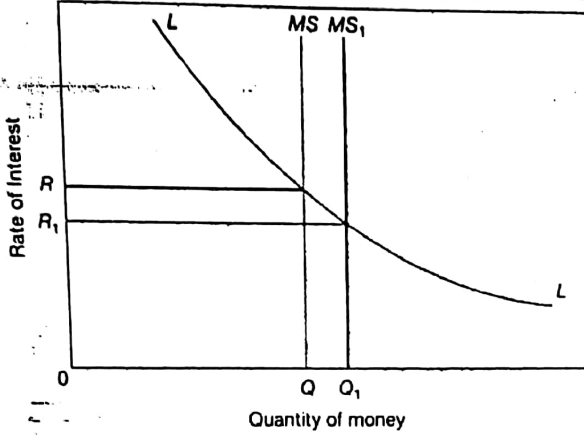
Limitations of LP-Theory

1. Assumption that that people only hold wealth in terms of cash and bonds is unrealistic.
2. Not effective in LEDCs where the financial institutions are not well established
3. Assumption that the money supply is fixed in the short-run. It is only true in the short-run. In the long-run money supply does change.
4. There is no difference in the interest rate. Since in an economy there are multiple interest rates operation. Example: Interest on personal loans might be different from mortgagee or business loan.
5. LP-Theory assumes that transaction and precautionary motives are completely interest inelastic but in the real world they might respond to the changes in interest rate where changes in interest rate when these changes are considerably high. People might demand more money when interest rates are low.

Lecture 1

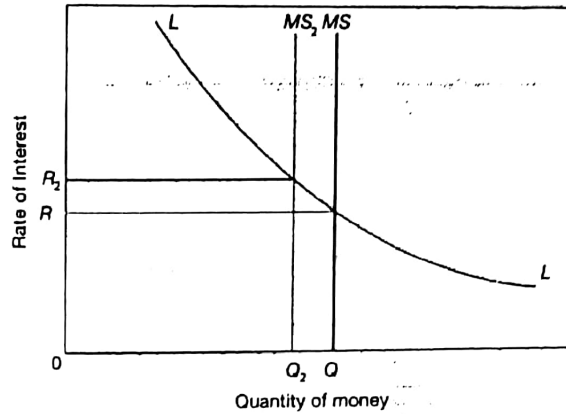
4. IMPACT OF CHANGES IN MONEY SUPPLY ON INTEREST RATES

Increase in Money Supply



Government's decision to raise money supply or credit creation by commercial banks shifts the supply curve for money from MS to MS1. Demand for money falls short of money supply at R and extra liquidity encourages households to buy bonds, raising their prices. This results in the interest rate to fall to R1.

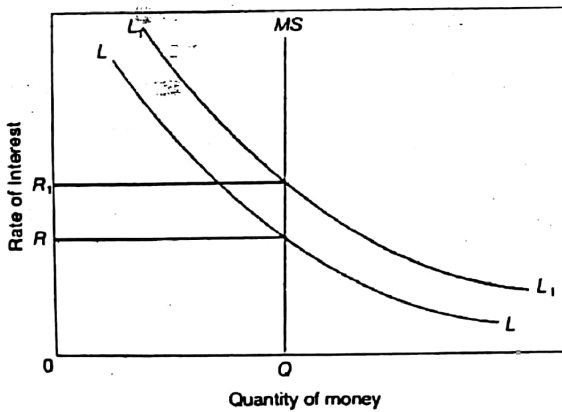
Decrease in Money Supply



Government's decision to reduce money supply or credit creation by commercial banks shifts the supply curve for money from MS to MS2. Demand for money exceeds money supply at R less liquidity encourages households to sell bonds, reducing their prices. This results in the interest rate to increase to R2.

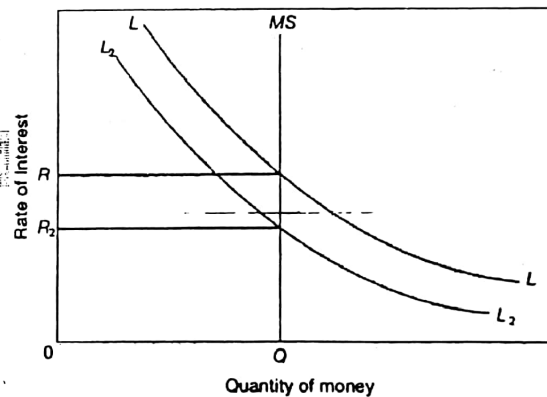
5. IMPACT OF CHANGES IN MONEY DEMAND ON INTEREST RATES

Increase in Money Demand



Initially the equilibrium is at R. The demand for money shifts to L1. Here the demand for money is more than the supply. Hence consumers would start to sell bonds. When supply of bonds increase the price of bonds drops. This increases the interest rate to R1.

Decrease in Money Demand



Initially the equilibrium is at R. The demand for money shifts to L2. Here the demand for money is less than the supply. Hence consumers would start to buy bonds. When demand of bonds increase the price of bonds increases. This decreases the interest rate to R2.

TOPIC 3: LOANABLE FUND THEORY

Definition: The theory of loanable funds explains interest rates not in the terms of total demand and supply of money, rather in terms of demand and supply for funds available of lending or borrowing. The equilibrium would be at a point where the demand for and supply of loanable funds is equal.

1. Demand for Loanable Funds [Investment]

The demand curve for loans slopes downwards because money is borrowed from consumption and investment purposes at lower interest rates. Hence a change in interest rate would cause a movement on the curve. Whereas a change in other factors would cause a shift. These factors can be:

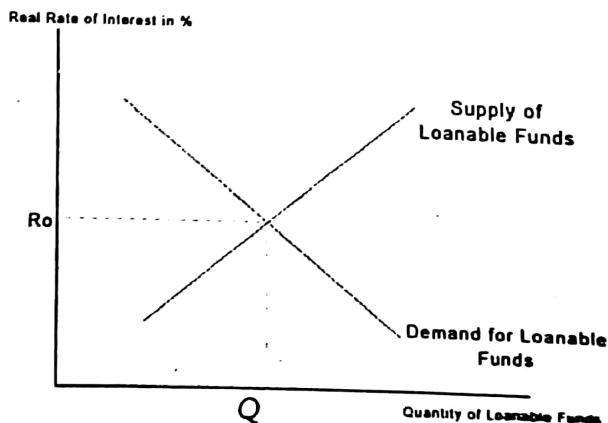
Factor	Description
1. Consumer and Business confidence	If the confidence of consumers and businesses are more in the economy people and firms would borrow more since they would trust more that they would be able to pay back the amount. Confidence \uparrow Demand for Loans \uparrow Confidence \downarrow Demand for Loans \downarrow
2. Technology and infrastructure	Wherever technology in the economy increases people and firms prefer to acquire more of it. This encourages the demand for loans to instantly acquire that technology. Technology \uparrow Demand for Loans \uparrow Technology \downarrow Demand for Loans \downarrow
3. Availability of better quality raw materials	Firms would want to purchase better quality raw material to improve production process. Since the better quality raw material would be expensive firms might need to borrow money to buy them. Quality Raw Material \uparrow Demand for Loans \uparrow Quality Raw Material \downarrow Demand for Loans \downarrow

2. Supply of Loanable Funds [Savings]

Supply curve for loans slopes upwards since higher interest rate encourage people to save more. Hence a change in interest rate would cause a movement on the curve. Whereas a change in other factors would cause a shift. These factors can be:

Factor	Description
1. Savings Culture	An increase in the savings culture would shift the supply curve to the right. Savings Culture \uparrow Supply for Loans \uparrow Savings Culture \downarrow Supply for Loans \downarrow
2. Banks Policies	If banks are lenient in giving loans this would shift the supply curve to the right. Banks Lenient \uparrow Supply for Loans \uparrow Banks Strict \downarrow Supply for Loans \downarrow

3. Equilibrium in the Loanable Funds Market



TOPIC 4: QUANTITY THEORY OF MONEY (QTM)

Definition: QTM presents one of the most important theories of inflation according to which money supply and price level are directly and proportionality related. Example: Doubling or halving money doubles or halves the price level respectively. This can be represented by the following equation

$$MV = PT$$

M = Stock of Money

V = Velocity of Circulation (How many times money changes hands)

P = Price Level

T = Volume of goods and services (National Real Income)

Note: The left side of the equation, (MV) represents the supply of money whereas the other side (PT) shows demand for money (PT also gives the value of money income).

For equilibrium to hold, MV must always equal to PT. In other words, **Supply of money must equal demand for money**. Example: An increase in quantity of money by 10% increases money income by 10% assuming velocity of circulation remains unchanged.

Quantity of Money assumes that:

1. Changes in Money supply do not affect velocity of circulation
2. There is always full employment in the economy and changes in money supply do not change volume of goods and services traded.

$$MV = PT \quad P = \frac{MV}{T}$$

This tells us that if V and T stay constant, if M increases, P will increase.

Keynesian Criticism on the QTM

1. The assumption of velocity of circulation remaining unchanged with changes in Ms is unrealistic. Increased Ms decreases interest rates and the opportunity cost of holding cash. As a result, people use their cash slowly thus decreasing velocity of circulation. Money supply is inversely proportional to the velocity of circulation.
2. Demand side economists believe that unemployed resources and excess capacity always exists. Increased Ms may therefore increase the volume of goods and services produced, having little or no impact on the price level. (Refer the Keynesian LRAS diagram).
3. Increased Ms is not spent in the product market so it has no impact on price level. The extra money is spent on bonds increasing their market prices and lowering interest rates.
4. Money supply does not determine the price level but is itself, price determined. Increased price level raises the demand for money and people use near money to fulfil increase liquidity requirements, raising money supply.

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TOPIC 5: MONETARY TRANSMISSION MECHANISM

Definition | Monetary Transmission Mechanism: This shows how changes in money supply or demand can influence the level of national income. We will have a look from both:

1. Change in the Money Supply
2. Change in the Money Demand [Same Impacts]

1. MONEY SUPPLY CHANGES

Definition | Monetary Policy: This is government policy that revolves around controlling money supply in the economy to achieve government objectives like inflation, unemployment, economic growth and balance the balance of payment. There are TWO types of monetary policies that the government can use:

1. Expansionary Monetary Policy
2. Contractionary Monetary Policy

1. Expansionary Monetary Policy | Increase Ms

Definition: These policies are made to remove the deflationary gaps in order words increase prices, create employment, increase GDP and to accelerate economic activity. In this policy the government tries to **increase the Ms** to boost the economic growth. The effects can be understood in **THREE** ways:

1. Direct Monetary Transmission Mechanism

$M_s \uparrow$ More money to Spend $\uparrow C \uparrow I \uparrow AE/AD \uparrow$ This leads to $[P \uparrow Y \uparrow \text{Employment} \uparrow]$

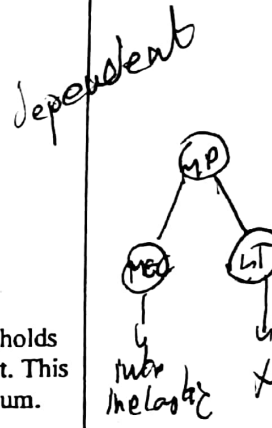
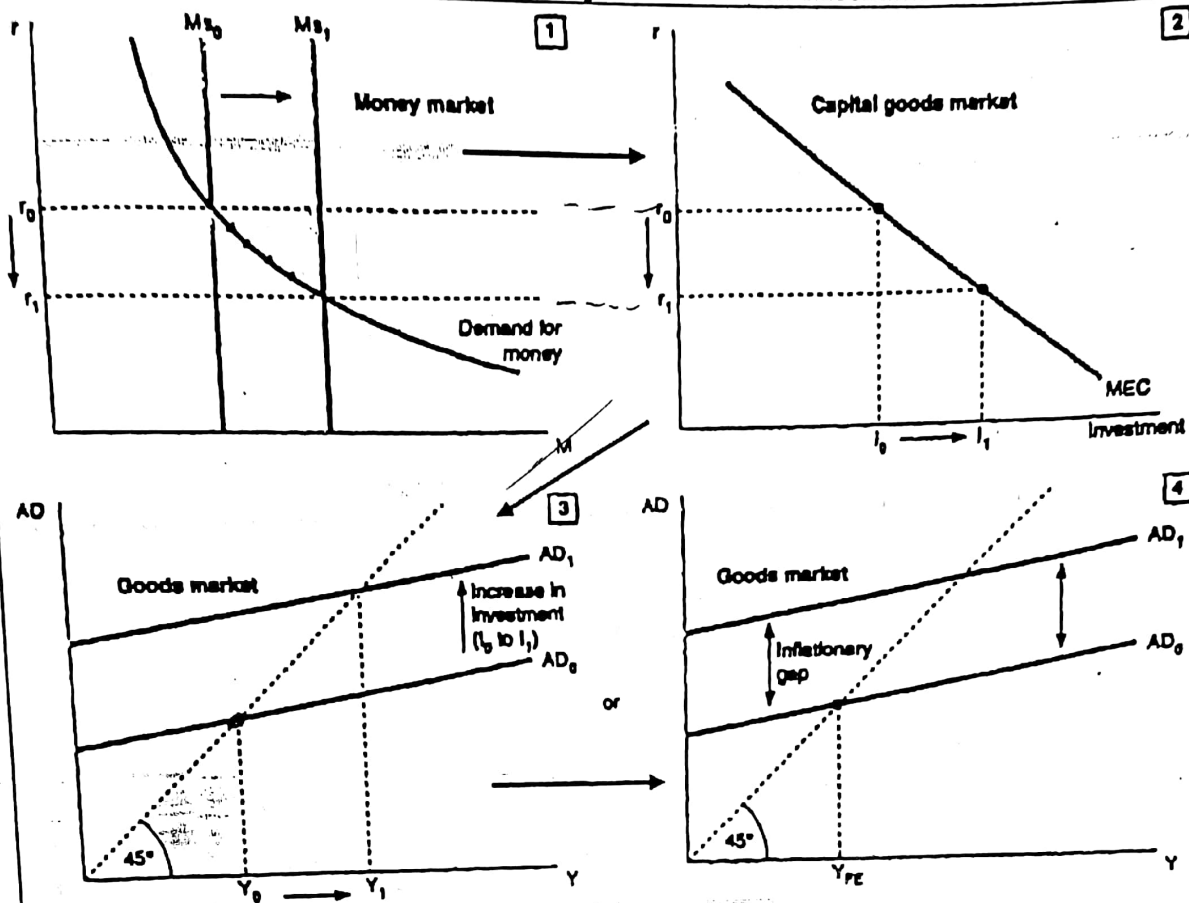
Monetarist believe:

1. The link between money supply and AD is not only indirect but also direct i.e. government excess liquidity, households and firms spend more on goods and services.
2. Lower Interest Rates increase households consumption as well as investments by the firms.
3. Demand for money is interest inelastic so any increase in the money supply will lead to a large fall in interest rates and a large effect on AD.
4. Investment is interest elastic so any changes in interest rates has a significant on AD. [Strong link between ir and AD]
5. Investment is not vulnerable to changes in expectation and so a fall in interest rate will increase AD. i.e. monetarist believe the link between money supply and AD is very strong. Because they believe economy is at/near full employment an increase in AD will lead to inflation.

2. Quantity Theory of Money

According to the QTM $MV=PT$, where 'V' & 'T' are constant, hence $M \uparrow P \uparrow$

3. Indirect Monetary Transmission Mechanism



1. Money Market

There is an increase in the money supply. At the old level of interest rates there is now excess liquidity. Households try to buy more bonds with the excess cash. This leads to a higher price for bonds and a reduced rate of interest. This happens till there is no incentive to move out money and the money and the bond markets are back in equilibrium.

2. Capital Goods Market

The lower interest rate will increase the amount of investment because the cost of borrowing has fallen, there are more investment projects which are now profitable. The extent of increase in investment will depend on how sensitive investment is in relation to changes in the interest rate i.e. (Interest rate elasticity of investment). This increased investment will lead to an upward multiplier.

Note: The more elastic it is higher would be the impact.

3. The goods market

With the increase in investment there is an increase in AD.

- If the economy is **below full-employment** this will lead to an increase in output and employment (Move towards full employment).
- If the economy is at **full employment** this will lead to an inflationary pressure on prices. [Inflationary Gap]

Limitation: If prices do increase, this will increase the money value of national income, which will increase the transaction demand for money. This will shift the demand for money outwards which in turn increases interest rates and brings AD down again i.e. a one off increase in the money supply will create forces that will reduce any inflationary gap and so the inflation. This assumes that the money supply is held constant and not increased again. Otherwise if the M_s is increased again at the same rate as prices are increasing, inflation can continue.

2. Contractionary Monetary Policy | Decrease Ms

Definition: These policies are made to remove the inflationary gaps in order words reduce prices to restore full employment. In this policy the government tries to **decrease the Ms** to reduce the inflation and improve BOP deficit. The effects can be understood in **THREE** ways:

1. Direct Monetary Transmission Mechanism

Ms ↓ Less money to Spend ↓ C ↓ I ↓ AE/AD ↓ This leads to [P ↓ Y ↓ Employment ↓]

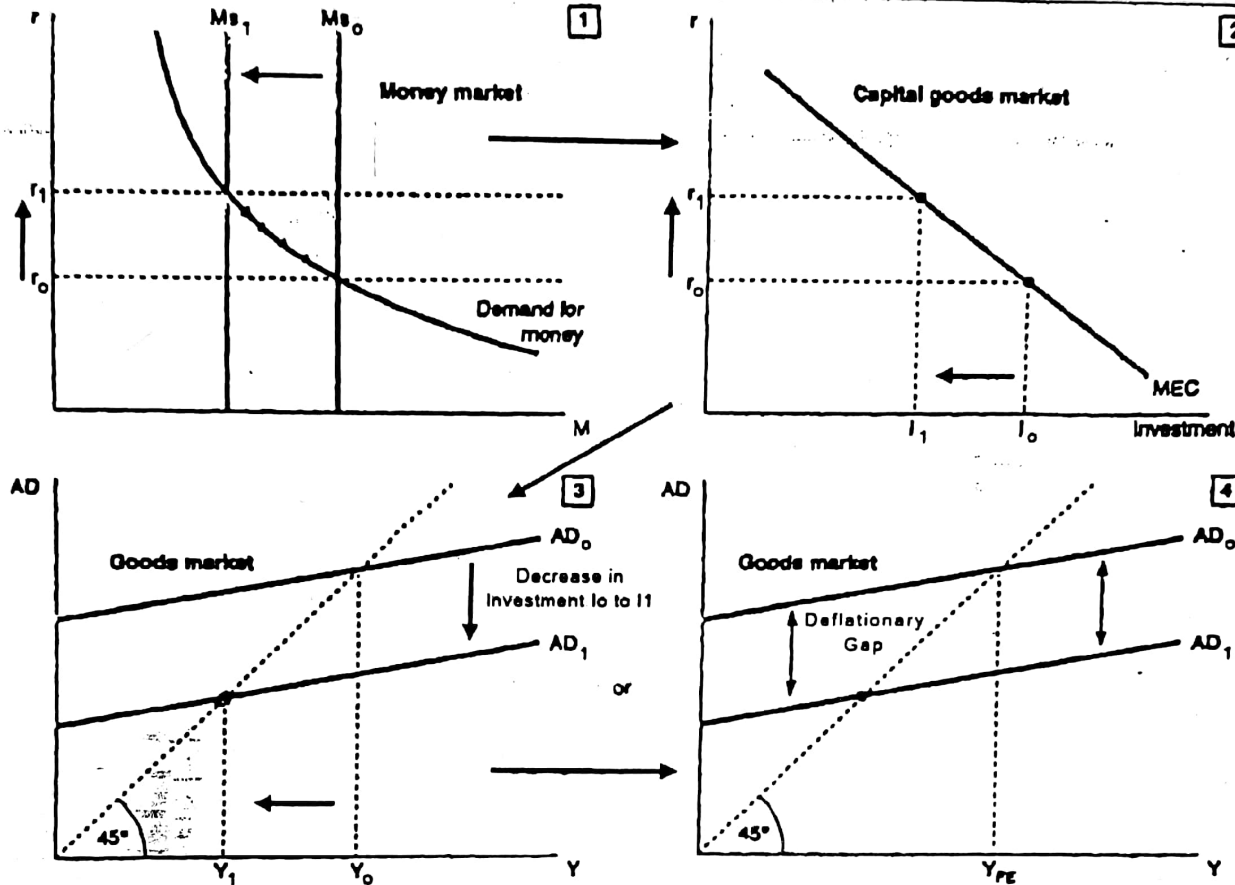
Monetarist believe:

1. The link between money supply and AD is not only indirect but also direct i.e. government less liquidity, households and firms spend less on goods and services.
2. Higher Interest Rates decrease households consumption as well as investments by the firms.
3. Demand for money is interest inelastic so any increase in the money supply will lead to a large fall increase interest rates and a large effect on AD.
4. Investment is interest elastic so any changes in interest rates has a significant on AD. [Strong link between ir and AD]
5. Investment is not vulnerable to changes in expectation and so a fall in interest rate will decrease AD. i.e. monetarist believe the link between money supply and AD is very strong. Because they believe economy is at/near full employment an increase in AD will lead to deflation.

2. Quantity Theory of Money

According to the QTM $MV=PT$, where 'V' & 'T' are constant, hence $M \downarrow P \downarrow$

3. Indirect Monetary Transmission Mechanism



1. Money Market

There is a decrease in the money supply. At the old level of interest rates there is now less liquidity. Households try to sell bonds with. This leads to a lower price for bonds and an increased rate of interest. This happens till there the money and the bond markets are back in equilibrium.

2. Capital Goods Market

The high interest rate will decrease the amount of investment because the cost of borrowing has increased, there are less investment projects which are now profitable. The extent of increase in investment will depend on how sensitive investment is in relation to changes in the interest rate i.e. (Interest rate elasticity of investment). The decreased investment will lead to a downward multiplier.

Note: The more elastic it is higher would be the impact.

3. The goods market

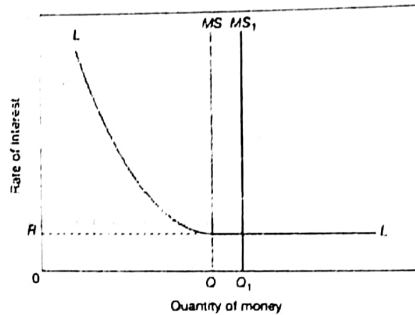
With the decrease in investment there is a decrease in AD.

- If the economy is above full-employment this will lead to a reduction in output and restoration of full employment.
- If the economy is at full employment this will lead to a deflationary pressure on prices. [Deflationary Gap]

Limitation: If prices do decrease, this will decrease the money value of national income, which will increase the transaction demand for money. This will shift the demand for money inwards which in turn decreases interest rates and brings AD up again i.e. a one off decrease in the money supply will create forces that will reduce any deflationary gap and so unemployment. This assumes that the money supply is held constant and not increased again. Otherwise if the Ms is decreased again at the same rate as prices are decreasing, deflation can continue.

3. Liquidity Trap | MS Increases has **NO** effect on Interest Rate

Definition: This occurs when an increase in money supply does not affect the interest rate and so does not affect investment or AD. Keynes thought it could occur when the rate of interest is very low and the price of bonds is very high. In this case, he thought that speculators would expect the price of bonds to fall in the future, so if the money supply was to be increased they would hold all the extra money. They would not buy bonds for fear of making a capital loss and because the return from holding such securities would be low.



If in the question, the govt is buying the bonds, this means an increase in money supply. If govt is selling the bonds, this means a fall in money supply.

4. Quantitative Easing

4 market data responses

Definition: When the rate of interest is very low, a central bank may decide to try to increase aggregate demand by engaging in quantitative easing. This involves a central bank buying government bonds from financial institutions, including commercial banks, in order to increase the money supply. With more liquid assets, it is hoped that the commercial banks will lend more which will increase investment and consumer expenditure and so aggregate demand and economic activity.

Limitations of Monetary Policy/Evaluations

Limitation	Description
1. Liquidity Trap	Economy might be trapped in a liquidity trap where increase in money supply will lead to unchanged interest rate and in return no change in the AD and price level.
2. Time Lags	Although monetary policy is quicker than fiscal policy but it takes time to impact. Supply does not affect the real economy instantaneously. It might be slow in the first quarters and with time create more impact.
3. Uncertainty	Policy makers are not aware of sudden unseen events. Example: Oil prices, political instability etc.
4. Reliability of Data	Economic data is imperfect. This problem is even worse in LEDCs. Hence the policy might be more effective in MEDCs however still even with that policy makers might not be able to make an appropriate decision.
5. Changes in the interest elasticity of investment	— Monetarists view investment is interest elastic and that's why monetary policy will have a strong multiplier effect on income, employment and prices. — Keynesians view that investment is interest inelastic and that's why monetary policy will have a weaker multiplier and smaller effect on income, employment and prices.

Lecture 3