

## **Theme-3** **Money and the Market System**

### **A Brief History of Money**

As pointed out by Keynes, money introduces new complexities in the working of the market system; specifically, it introduces the possibility of a general glut. But before we understand the implications of money in business cycles, it is important for us to first know what money is.

I strongly suggest that students watch the series “The Ascent of Money” by Niall Ferguson. You can watch it at:

<http://topdocumentaryfilms.com/the-ascent-of-money/>

### **The Supply of Money & Quantity Theory of Money**

Money, as we have seen, is anything that is widely accepted in payment of goods and services and as discharge of debt. What should be counted as money in a modern market economy<sup>1</sup>? These, referred to as **monetary aggregates**, constitute **money supply**. ?

Money has three important functions in an economy:-

1. A medium of exchange
2. A store of value
3. A measure of value or unit of account

We know that exchange (trade) allows specialization and thereby division of labour, which in turn makes society better off in terms of their levels of consumption of goods and services. Without money such **exchange** would be based on barter that would severely limit the possibilities for exchange and specialization. Imagine a neurosurgeon willing to buy a refrigerator in a moneyless economy. Money also acts as a **store of value**: if I receive my remuneration for this lecture I do not have to rush and exchange it for rice now; I can do that later ... after a day, a month or whenever (inflation may be a concern though). Finally, money acts as a **unit of account**; the value of any good or service can be expressed in terms of money, which is an agreed common denominator.

There is another important function that money provides ... to its issuer. It is called **seigniorage**, and is the difference between the value of money and the cost to produce it. Today this seigniorage accrues to the state and assumed that it will be spent towards the general welfare of citizens. However, a country like the US whose currency functions as an international reserve currency derives the benefit of international seigniorage. There is always the temptation for states to issue more currency to extract seigniorage. However, this would lead to inflation (also called inflation tax) and erode the value of a currency. Users would be tempted to store value in other currencies, or say gold.

<sup>1</sup> The history of money is most fascinating. But it will be beyond the scope of this course. There is plenty of material on the Web ... if you are interested.

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Who or what determines how much money is there in an economy? In other words, who or what determines money supply? It is useful to break up our question into two parts:

1. Who or what determines the quantity of notes and coins in circulation?
2. Who or what determines the amount of deposits with financial institutions that people have?

The answer to the first question is: the central bank (or Reserve Bank of India) acting on behalf of the government (with varying degrees of autonomy) and the answer to the second question is: commercial banks and financial intermediaries, together with people themselves.

**The Central Bank (RBI):** the major functions of the central bank are:

- a. **Financial regulator**, i.e. to oversee the overall management and efficient functioning of the financial sector of an economy
- b. Act as the government's agent (to lend to the government to finance its debt). However, in many countries of the world, central banks have been given greater autonomy and may not always lend money to the government.
- c. Banker to the government including the Exchequer or Treasury where it keeps revenues from taxation and from which government spending is financed.
- d. Banker to other financial intermediaries: these include commercial banks which hold their operational balances with the central bank.
- e. Lender of last resort: providing liquidity to banks and other financial institutions which may have become temporarily illiquid, by rediscounting bills (purchasing of bills of exchange before they have reached their maturity), or bond (gilt) **repos** (buying back government bonds for a short period only, say, for two weeks only, after which they have to be repurchased by the original borrower). This process is called **repos**.
- f. Regulator of money supply through:
  - Control of monetary base
  - Control of commercial banks' reserve requirements
  - Open market operations
  - Manipulation of interest rates by setting its 'base rate'.

**Commercial banks and financial intermediaries:**

- a. Facilitate the process of transmitting payments through their clearing system
- b. Use liquid assets in the form of bank deposits to finance the illiquid investments of borrowers. Banks can **create** liquidity because it is not necessary for a bank to keep all the funds deposited with it in the form of highly liquid assets. Since not all deposit holders will withdraw all their deposits at the same time, the bank can lend out a substantial part of their deposits as loans and mortgages. Usually the central bank stipulates a part of the deposit which a bank must hold as **bank reserves** in its account with the central bank. This provides necessary liquidity to the bank to satisfy the withdrawals made by depositors.

Now the central bank affects the money supply by controlling the amount of notes and coins in circulation. How do commercial banks affect the money supply through deposit accounts?

When a customer makes a deposit into his account at a bank, this creates a **liability** for the bank. A liability describes the bank's obligations, or what it owes to others. In other words, the bank is liable for the amount of the deposit. On the other side of the coin, the deposit creates an **asset** for the bank. The bank now owns the value of the deposit and will put the money to work, looking for a rate of return that exceeds the interest it pays on the liability. This is the business of banking. By offering savers a return (and/or other services), banks take in deposits (liabilities), which creates assets that a bank can lend out. As long as the total return on assets exceeds the payment on liabilities (and other costs of doing business) the bank is profitable.

When a bank receives a deposit, it must keep a portion on reserve with the central bank (RBI). At the present time, the RBI's reserve requirement is (say) 10%. With this in mind, let us use a few balance sheets to demonstrate how banks create money from deposits. We will see that for every rupee deposited, the money supply increases by a multiple of the amount deposited.

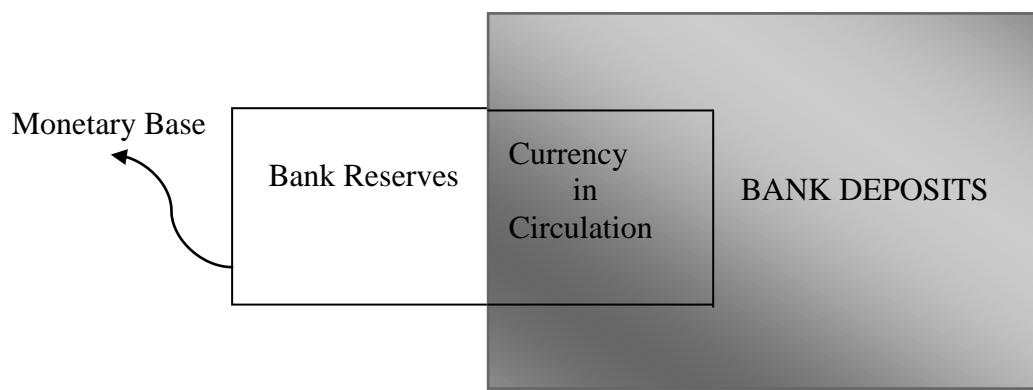
For an initial increase in deposits by an amount  $D$ , the total increase in deposits is:

$$D + (1-r)D + (1-r)^2D + \dots = (1/r)D, \quad 0 < r < 1 = \text{reserve requirement} = \text{liquidity ratio}$$

**1/r = money multiplier**, which equals to one divided by the reserve requirement or liquidity ratio. While we will work with the simple multiplier, in reality there are a number of leakages from the above scenario that will reduce the value of the multiplier:

- a. People may not deposit all of their cash into the banking system. Besides the money we keep in our wallets, we may save some of our money outside the depository banking system.
- b. Banks may not loan out all potential reserves, choosing to keep **excess reserves**.

The **monetary base ( $M_0$ )** is equal to **bank reserves plus currency in circulation**. It is different from **money supply, bank deposits plus currency in circulation**. Each rupee of **bank reserves backs several rupees of bank deposits**, making money supply larger than the monetary base. See Figure-2.



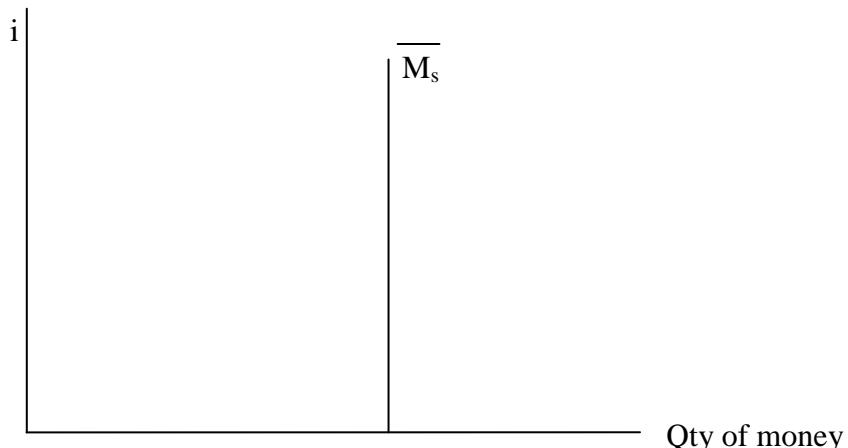
**Figure 2: Money multiplier = money supply/monetary base**

## Control of money supply

The central bank controls money supply by:

1. controlling the monetary base
2. imposing or changing commercial banks' reserve ratio
3. changing the base rate at which it lends to commercial banks
4. selling/buying government bonds to/from the public with open market operations (OMO). The selling of bonds increases money supply and buying of bonds decreases money supply.
5. Purchase of government bonds from the government: these bonds are issued by the government and bought by the central bank. The government then spends the money with the deposits created. The government can also buy back its bonds from the central bank to reduce money supply.

Money supply ( $M_s$ ) or specifically the monetary base then is determined jointly by the government and the Central Bank of the country and is not dependent on the interest rate ( $i$ ). Therefore, **with respect to the relationship between  $M_s$  and  $i$ , we can say that  $M_s$  is exogenous.** This is illustrated in Figure 3 below.



**Figure 3**

For several hundred years (dating back to David Hume in the 17th century), economists have debated whether or not changes in the money supply will affect variables like production, employment or real wages. The Classical Dichotomy separates economic variables into two classes: nominal and real variables: **nominal variables** (variables measured in monetary units) and **real variables** (variables measured in physical units).

Real variables, like the production of goods and services, are determined by economic factors **other than** the size of the money supply. For example, the production of goods and services is dependent on productivity and factor supplies. Economists do **not** expect that a change in the money supply will at all affect the production of goods and services. **Money is therefore neutral in the sense that it cannot affect these real variables.** Therefore, in an economy that exhibits the

classical dichotomy, the money supply only affects nominal variables like the price level. This is exemplified by the Quantity Theory of Money.

### The Quantity Theory of Money

The quantity theory descends from Copernicus and various others who noted the increase in prices following the import of gold and silver, used in the coinage of money, from the New World. Copernicus observed:

“Money can lose its value through excessive abundance, if so much silver is coined as to heighten people’s demand for silver bullion. For in this way, the coinage’s estimation vanishes when it cannot buy as much silver as the money itself contains. The solution is to mint no more coinage until it recovers its par value”.

The QTM begins with a simple identity (also called Fisher’s Equation):

$$M \cdot V \equiv P \cdot T \dots\dots (1)$$

Where **M** = money supply; **V** = velocity of circulation of money; **P** = price level and **T** = number of transactions that take place in a given period. Note that **V** or the velocity of circulation of money is the average number of times that a rupee is used annually to finance transactions, i.e. to buy goods and services produced in the economy.

If we hold **V** and **T** as constant at **V** and **T**, then:

$$M \cdot V = P \cdot T$$

Therefore, increases in **M** must lead to increases in **Q**.

it should be **P** right ?  
**Q**-real output

### Keynesian Theory of Money & Interest

We now look at the **Keynesian demand for money**; this demand does not mean how much money do people want? Instead, it refers to the basis on which people decide how much of their income and wealth they wish to keep in a liquid form as money. As we have seen in the previous chapter, people can hold their wealth in a variety of ways or a portfolio of assets.

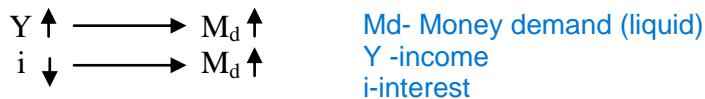
Keynes identified three reasons why people may want to hold money (as opposed to other assets). These are:-

1. The transactions demand for money
2. The precautionary demand for money
3. The speculative demand for money

The **transactions demand for money**: this is the amount of money you wish to hold as cash for day-to-day transactions of buying goods and services. Generally, the higher the income the

greater amount of money you would keep for transactions. Also, the transactions demand for money may vary inversely with interest rates. High interest rates may mean you rather keep your money in interest-yielding assets rather than as cash. Therefore,

$$M_d = f(Y, i)$$



The **precautionary demand for money**: the uncertainty about the degree of to which receipts and payments will be synchronized leads to the precautionary motive for holding money. The relationship between this demand for money and income and interest levels is the same as that of the transactions demand.

The transactions demand and precautionary demand are usually referred to as the **demand for active balances**.

The **speculative demand for money**: this is also referred to as demand for idle (cash) balances and is held in preference to other assets if this is perceived to be in the holder's financial interest. This is a profit-maximizing decision. But why would an individual wish to hold non-income yielding money compared to an income-yielding asset? This is possible when the price of the asset is likely to fall (like bonds, stocks or a house).

Now assume only one asset (bonds) in our portfolio of assets in addition to money where interest,  $y$ , is given by:

$$y = \frac{c}{P_B}$$

where  $c$ =coupon value and  $P_B$  = price of bond

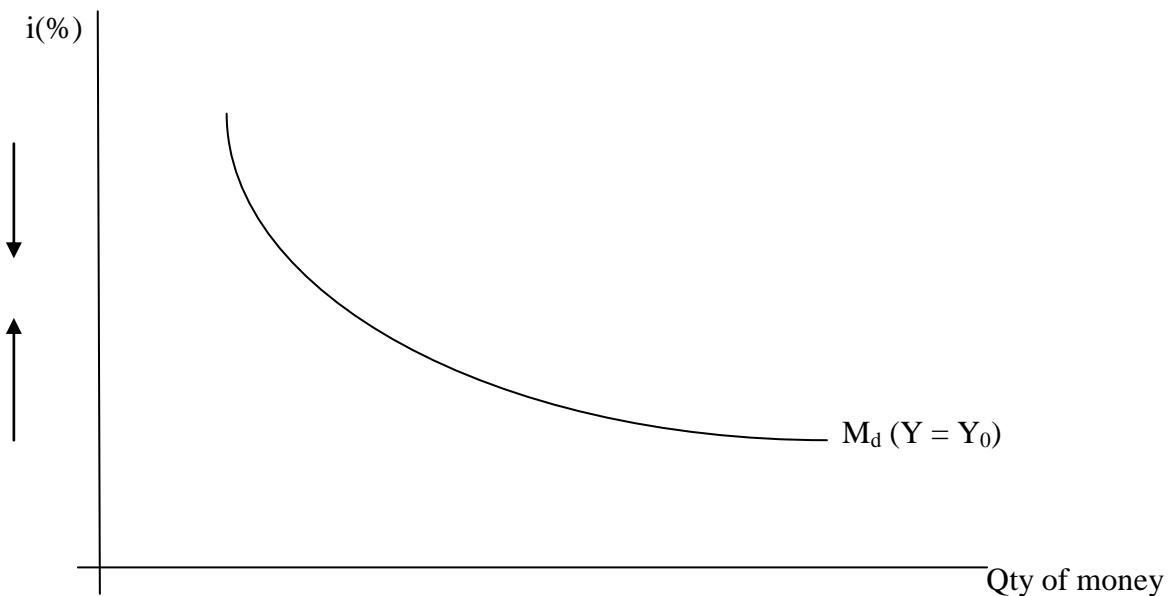
Suppose  $c = \text{Rs.}5$  and  $P_B = \text{Rs.}100$ , then  $y = 5\%$ . If interest rates rise to say, 10%, then given  $c = \text{Rs.}5$ ,  $P_B$  must fall to Rs.50.

Now  $y$  becomes the reference for interest rates, i. This is the rate at which industry can borrow from the market (give equal risk). Generally speaking, when yields are low there may an expectation that they would increase so that bond prices will fall. Therefore, people would want to hold cash or speculative demand for cash is high. Conversely, when yields are high, people may expect yields to fall and bond prices to increase, so that speculative demand for money would be low. The horizontal summation of the money demand curve for each individual gives us the demand for money function or **liquidity preference schedule**. This inverse relationship is shown in Figure 4 (for a given level of income,  $Y$ ). Changes in  $Y$  would mean a shift in the  $M_d$  curve.

$y=\text{yield}$

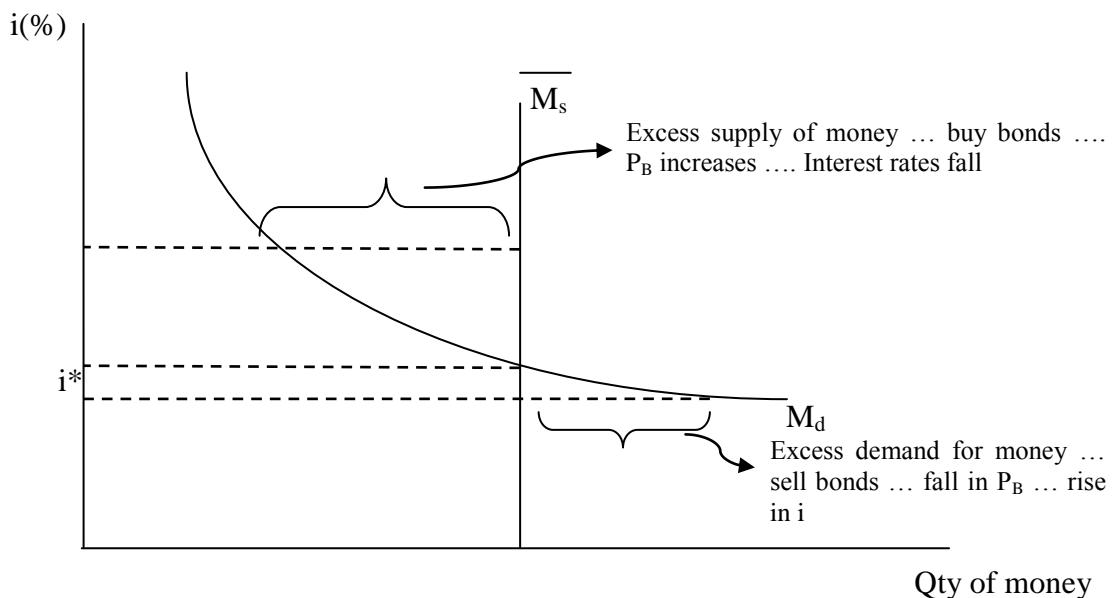
————→ We now use **i** instead of **y**.

### Case of Y constant



**Figure 4**

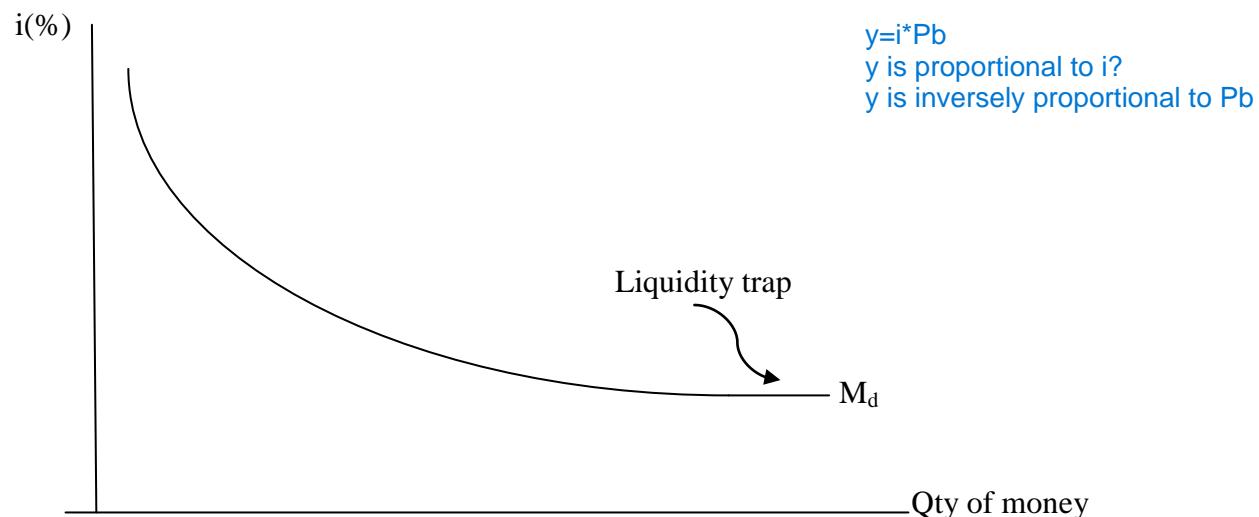
When we put supply of and demand for money together we get the equilibrium rate of interest,  $i^*$ , where the two curves intersect. At  $i^*$  people are satisfied with their money holdings. They are neither trying to increase or reduce their money holdings, they are neither selling nor buying bonds, so that asset prices are neither falling nor rising. If people desire to change their money balances, the price of bonds would change and thereby  $i^*$ . See Figure 5.



**Figure 5**

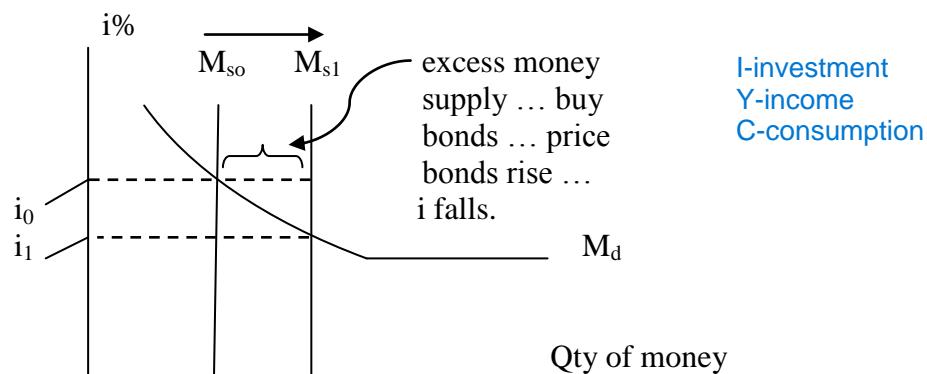
One additional comment on the  $M_d$  and  $M_s$  curves; we have assumed in the discussion so far that price level is constant. The curves therefore should be real  $M_d$  and  $M_s$  curves and may also be indicated as  $M_d/P$  and  $M_s/P$ .

Consider a situation where  $i = 20\%$  and  $P_B = \text{Rs.}1000$  with yield =  $\text{Rs.}200$ . Since  $i$  is high it may be expected to fall and  $P_B$  rise. However, if it rises instead to  $21\%$ , then with  $y = \text{Rs.}200$ ,  $P_B = 952$  which means a capital loss of  $\sim \text{Rs.}48$ . However, suppose  $i = 1\%$ , and it rises to  $2\%$ , then with  $y = 200$ ,  $P_B$  falls from  $\text{Rs.}20000$  to  $\text{Rs.}10,000$ . This is a massive capital loss. Therefore, at low rates of interest the demand for idle balances (no one is willing to hold bonds) will be so high that the  $M_d$  curve becomes horizontal. This is called **liquidity trap** and is shown in Figure 6.

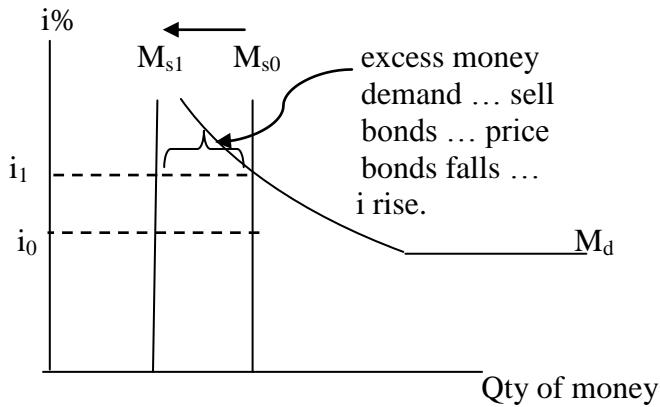


**Figure 6**

We have already seen the instruments of monetary policy that the Central Bank can effect so as to change  $M_s$ . Figure 7 and 8 show the effects of an increase and decrease in  $M_s$  on interest rates. An increase (decrease) in  $M_s$  can lower (raise) interest rates, which in turn will affect aggregate demand especially  $I$  and  $C$  and thereby  $Y$  and employment. An active monetary policy is advocated in Keynesian theory to stabilize the economy.



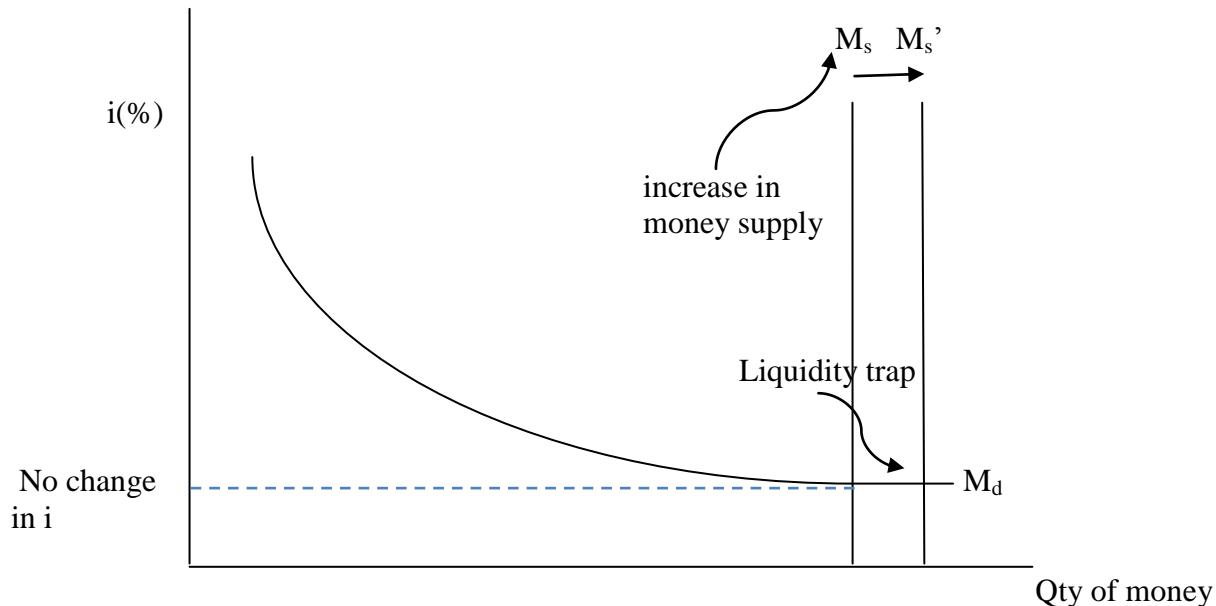
**Figure 7**



**Figure 8**

However, during a recession or depression, Keynes argued that interest rates may be low and the economy would be facing a “liquidity trap” situation where any excess supply would be absorbed into speculative demand for idle balances. If so, increases in  $M_s$  may not be able to lower interest rates and monetary policy would be ineffective. He, therefore, advocated fiscal policies during times of recession or depression. See Figure 9.

**Figure 9**



### Monetary Policy: Classical, Keynesian and Monetarist Perspectives

The Classical view of the economic world was essentially what we have studied in our microeconomics course. The market system when it is allowed to operate freely will lead to an efficient allocation of resources. The general policy guideline would be minimal government intervention except as a regulator and in situations of market failure. Prices play a key role in the

functioning of the market system. It is **through price changes** that supply and demand are brought into **equilibrium**. In the Classical doctrine of *laissez-faire* prices act as a powerful incentive and people acting in their own selfish interest will automatically bring about an outcome (allocation of resources) that leads to optimal **social welfare** (defined as the sum of consumer and producer surplus). social welfare

In the Classical worldview, a free labour market would ensure full employment, i.e. wages would bring about equilibrium in the demand for and supply of labour. Should unemployment rise, a temporary excess supply of labour would induce a fall in nominal wages. Firms would then begin to hire more workers until demand for labour is equal to supply of labour.

Enter Keynes. Keynes believed that in the real capitalist world prices (including wages) are **sticky**. Often **prices do not respond as expected in disequilibrium** situations (trade unions, oligopolies, branded goods, etc.). If this is so then the only option for demand and supply to be in **equilibrium is changes in output**. This change (cut) in output would mean unemployment; rather **equilibrium with unemployment of resources** (including labour).

Consider a labour market where a fall in demand means an excess supply of labour. If wages do not fall, we have unemployment. Keynes also felt that during a recession if wages are cut, business expectations turn more negative than they are so that firms make further cuts in production. **Wage cuts would, therefore, not induce firms to hire more people; rather, they may lead to more unemployment.**

A financial market in the Classical economists' view was essentially a market where **savers come with "loanable funds"** and find **borrowers or investors**. Like all other markets, the price for these loanable funds was the **interest rate** and it is this "price" that would lead to equilibrium in financial markets. Keynes was not convinced. He argued that **savings and investment depended not on interest rates but also on other factors like level of income (Y) and expectations.**

Another point of difference between the **Classical** and **Keynesian** view relates to **Say's Law**. Recall our introduction to macroeconomics. According to Say's Law, a **general glut is not possible**. However, according to **Keynesians** this happens because money (as a commodity) was not included in the system. Once money is introduced, market adjustment may not be as straightforward as imagined by the **Classicists**. A **general glut becomes a possibility**.

For several hundred years (dating back to David Hume in the 17th century), economists have debated whether or not changes in the money supply will affect variables like production, employment or real wages. The **Classical Dichotomy** separates economic variables into two classes: nominal and real variables: **nominal variables** (variables measured in monetary units) and **real variables** (variables measured in physical units).

**Real variables**, like the production of goods and services, are determined by economic factors **other than** the size of the money supply. For example, the production of goods and services is dependent on productivity and factor supplies. Economists do **not** expect that a change in the money supply will at all affect the production of goods and services. **Money is therefore neutral**

in the sense that it cannot affect these real variables. Therefore, in an economy that exhibits the classical dichotomy, the money supply only affects nominal variables like the price level.

Keynes' response to the classical dichotomy was that money supply can have an impact on real variables. This is because interest rates are not determined by the demand for and supply of loanable funds (savings and investment) but by the demand for and supply of money.

Monetary policy, i.e. changing the monetary base, open market operations, change in banks' reserve ratio, and changing base rate can affect real variables like Y and N. When money supply increases interest rates fall and this would cause aggregate spending to rise. Based on the multiplier theory, a rise in aggregate spending (say, C and I) would lead to a multiple increase in Y and thereby increase level of employment (reduce unemployment). However, during deep recessions and depressions, the liquidity trap hypothesis tells us that any increases in money supply would be absorbed as idle cash balances so that interest rates do not fall. This renders monetary policy ineffective as an instrument to reduce unemployment. Keynes, therefore, advocated fiscal policy (direct increases in G) to increase Y and reduce unemployment.

However, there are some extremely important questions that were raised about Keynes' demand for money function. In Keynes' *General Theory*, portfolio balance is reduced to the choice between money (idle cash balances) and fixed-interest bonds alone. If fixed-interest bonds are taken as representative of capital assets as a whole, this may be justified as a simplifying assumption. But this may not be so.

By taking bonds as representative of all capital assets, Keynes' was able to draw a simple link between money and interest rates (since  $i = y/P_B$ ). What happens if the range of non-monetary assets were widened to include real assets (like houses and real estate) as well? Would Keynesian monetary theory still hold water?

Suppose we start from an equilibrium situation. An increase in money supply would lead to an increase in money balances and an increase in demand for (say) commercial real estate. Prices of real estate would increase, and yields decline. Similarly, the price of bonds would rise and yields (and interest rates) fall. However, a sharp increase in real estate prices may actually lead to people selling of their bonds and switching to real estate. In such a situation, bond prices would begin to fall and yields (and interest rates) rise. The basic hypothesis of Keynesian theory falls through.

This is the core of the monetarist argument: an increase in money supply would not lead to an increase in aggregate demand but this is not due to reduced interest rates. It arises because real assets are a part of people's portfolio of assets. Now this increase in aggregate demand will, however, not mean an increase in Y and N; rather it translates finally into an increase in price. The monetarists revert to the Classical Quantity Theory of Money to relate money supply to price level.

Returning to the QTM, we have seen that it rests on two propositions:-

- velocity of circulation of money is constant ( $V = \bar{V}$ )
- real output in an economy is not affected by the quantity of money ( $Q = \bar{Q}$ )

Both these propositions are questioned by Keynesians. First, they argue that  $V$  tends to vary inversely with  $M$ . If money supply increases in the economy, for a given level of output, money will tend to change hands more slowly. This is because when money supply increases, interest rates fall (because bond prices rise). This increases speculative demand for money (idle balances) so that  $V$  falls. Now change in interest rates will also affect real output ( $Q$ ) by inducing changes in  $I$ ,  $C$  and exchange rates (and therefore,  $X$  and  $M$ ).

Monetarists, on the other hand, argue that  $V$  is an institutional constant determined independently of money supply by payment practices. Therefore any increase in  $M$  will mean an increase in  $(P.Q)$ :

$$M \cdot V = (P \cdot Q)$$

The increased demand for goods and services as well as assets will increase. This drives up prices and reduces yields and interest rates. The increase prices will choke off demand in the long-run (monetarists) or even perhaps in the short-run itself (the New Classical economists). In the monetarist (long-run) view, as aggregate demand increases, prices of final goods begin to rise and firms respond by increasing production. However, this induces prices of intermediate goods to rise including the price of labour, i.e. wages.

To conclude: the monetarists claim is that in the long-run, money supply (or monetary policy) is an effective instrument in controlling inflation, not level of output and employment. The Keynesian view is that monetary policy can be effective (except if we are in a liquidity trap) in changing output and employment until full employment level of output is reached.

### **The Role of the Central Bank**

While the debate between monetarists and Keynesians may continue, the fallout of economic theory has no doubt lead to greater autonomy of central banks in most market economies of the world and a gradual shift in the role of the central banks in targeting inflation rather than levels of  $Y$  and  $N$ . In this move, interest rates as a target have also assumed significance as it directly affects exchange rates. Therefore, one can say that central bank have kept interest rates more at levels consistent with stability of currency rather than full employment.

The importance of inflation and interest rates combined with autonomy of Central Banks has also had an important impact on fiscal policies or government spending. After all, monetizing deficits or raising public debt will affect the objective of Central Banks. Governments are therefore more and more constrained in the use of fiscal instruments to stabilize the economy. The European Union is the most extreme example of this.

What we are seeing then is trend towards governments reducing interventions to smoothen business cycles and focus on longer-run supply side issues. However, in today's crisis situation, a return to Keynesian fiscal stimulus packages seems to be the only course open to governments and even Central Banks throughout the world ... a full circle from the Great Depression of the 1930s.