MACRO ECONOMICS II

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Unit - I
Classical and Keynesian Synthesis

Monetarism and Keynesianism Comparison

The old monetarists like Irving Fisher put forward quantity theory of money which explained the changes in money supply had a direct and proportionate relationship with the price level. While the Keynesian macro economic theory explains that the quantity theory of money not only explains the changes in general price level.

The main difference between the monetarists and keynesians lies in their approaches to the determinatiln of aggregate demand.

Keynesians say that many different factors such as consumption investment government expenditure, taxes, exports and moneydetermine aggregate demand whereas monetarisys argue that the changes money supply determines the aggregate demand which affect both output and prices.

Another important difference is, monetarists believe that private market economy inherently stable and if left free will automatically adjust itself to full employment level of output on the other hand keynesians believe that private economy is inherently unstable and for its stabilisation and growth, the government should play an active role by adopting proper discretionary fiscal and monetary policies.

Economic Stabilization
Fiscal Policy

- **Macro economic policy and stabilization:**

  Economy does not always work smoothly. Often there is fluctuations I the economic activity.

  At the time of recession, the levels of national income and employment are far below their full potential level, at this time there is a lot of idle or unutilized productive capacity, thereby unemployment of labour increases along with the existence of excess capital stock.

  On the other hand at times of inflation there is increase in prices. Thus in a free market economy there is lot of economic instability

  The classical economists believe that an automatic mechanism works to restore stability in the economy.

  In reality, during 1930's depression in western capitalistic economics and in the II world war period shows that no such automatic mechanism works to bring about stability in the economy.

  So Keynes argued that government intervention should be there to cure depression and inflation by adopting appropriate tools of macro economic policy such as fiscal policy and monetary policy.

Keynes said that monetary policy way in effective to lift the economy out of depression, He emphasized the role of fiscal policy as an effective tool for the stabilisation of the economy, However in view of the modern economists both fiscal and monetary policies play a useful role in stabilizing the economy.

Goals of macro economic policy

There are three important goals or objectives of macro economic policy (for both fiscal and monetary) are follows**:**

1) Economic stability at a high level of output and employment.

2) Price stability

3) Economics Growth

Fiscal policy for stabilisation:

Fiscal policy is an important instrument to overcome recession and control inflation in the economy.

There are two kinds of fiscal policy:

1) Discretionary Fiscal Policy

2) Non-Discretionary Fiscal Policy

Discretionary fiscal policy is deliberate change in the government expenditure and taxes to influence the level of national output and prices.

Non-Discretionary fiscal policy of automatic stability is a built-in tax or expenditure mechanisms that automatically increases aggregate demand when recession occurs and reduces aggregate demand when there is inflation in the economy without any deliberate actions on the part of the government.

At the time of recession the government increases its expenditure or cuts down taxes or adopts a combination of both on the other hand to control inflation the government cuts down its expenditure or raises the taxes. Therefore to cure recession expansionary fiscal policy and to control inflation contractionary fiscal policy is adopted.

Fiscal policy to cure recession

The recession in an economy occurs when aggregate demand decreases due to a fall in the private investment, resulting in decline in marginal efficiency of investment, So the aggregate demand curve shifts down creating deflationary gap or recessionary gap. To close this gap fiscal policy increases government expenditure or reducing taxes.

There are two fiscal methods to get the economy out of recession:

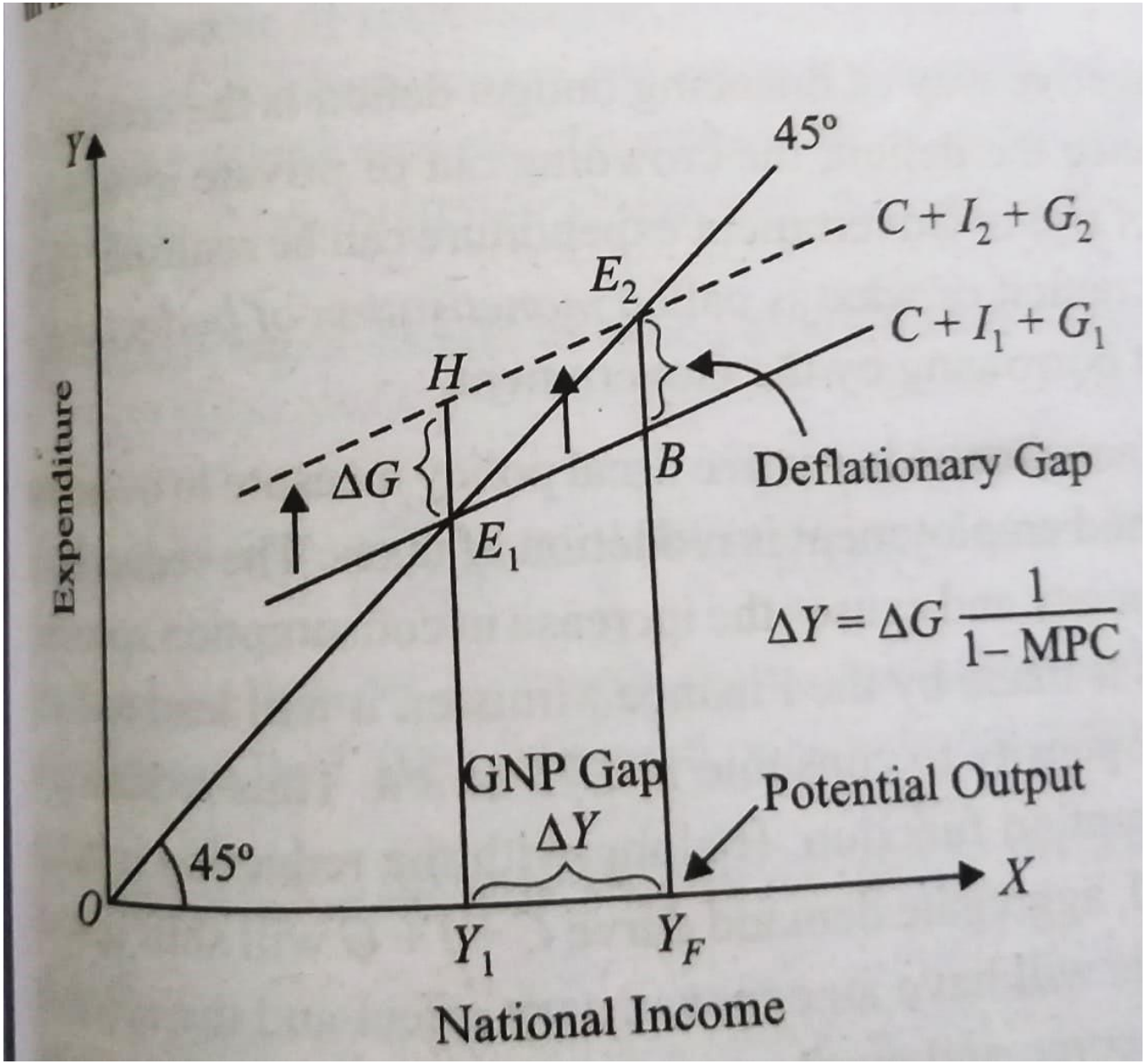
1) Increase in government expenditure

2) Reduction of taxes

Increase in government expenditure to cure recession

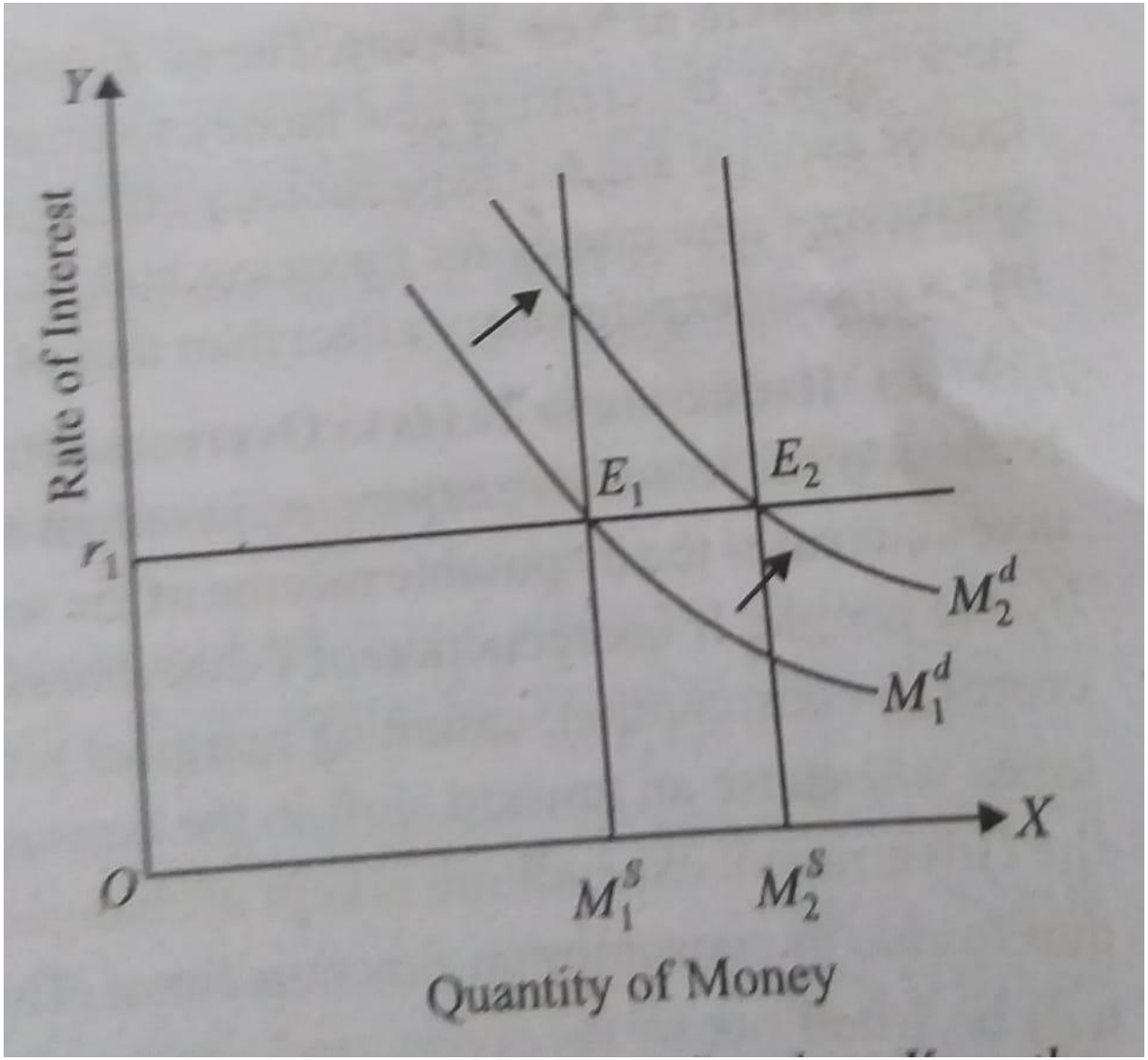
Increase in government expenditure is an important tool to cure depression under discretionary fiscal policy. Government may increase expenditure by starting public works, such as building roads, dams, ports, telecommunication links, irrigation works, electrification of new areas, etc. For these works government buys various goods and materials and employs workers, There will be direct and indirect effect in the form of working of multiplier.

The size of the multiplier depends on the marginal propensity to consume. The impact of the increase in government expenditure in recessionary condition is illustrated in the following fig.


Y
45°
$C + I_2 + G_2$
E_2
$C + I_1 + G_1$
H
ΔG
B
Deflationary Gap
E_1
Expenditure
$\Delta Y = \Delta G \frac{1}{1 - MPC}$
GNP Gap
ΔY
Potential Output
45°
0
X
Y_1
Y_F
National Income

Suppose to begin with the economy is operating at full employment or potential level of output Y_F with aggregate demand curve $C+I_2+G_2$ intersecting 45^0 line at point E_2. Now due to some adverse happening (crash in the stock market) investor's expectation of making profits from investment projects become dim causing decline in investment. With the decline in investment E_2B, aggregate demand curve will shift down to new position $C+I_1+G_1$ which will bring the economy to the new equilibrium position at point $E_1$and thereby determine Y_1 level of output or income. The fall in output will create involuntary unemployment of labour and also excess capacity will come to exist in the economy. Thus emergence of deflationary gap equal to E_2B and the reverse working of the multiplier has brought about conditions of recession in the economy.. To overcome recession if the government increases its expenditure by E_1H, the aggregate demand curve will shift upward to original position $C+I_2+G_2$ and as a result equilibrium level of income will increase to the full employment or potential level of output Y_F and this way the economy would be lifted out of depression.

With the increase in government expenditure and resultant increase in output and employment demand for money transactions purposes is likely to increase as is shown in the following figure.


Y
Rate of Interest
r_1
E_1
E_2
M_2^d
M_1^d
X
O
M_1^s
M_2^s
Quantity of Money

Where demand for money curve shifts to right from M^4_1 to M^4_2 as a result of increase in transaction demand for money. Money supply remaining constant, with increase in demand for money rate of interest is likely to rise which will adversely affect the private investment. The decline in private investment will tend to offset the expansionary effect of rise in government expenditure. Therefore, if fiscal policy of increase in government expenditure is to succeed in overcoming recession.

Reduction in Taxes to overcome Recession

The reduction in taxes increases the disposable income of the society and causes the increase in consumption spending by the people. The reduction in taxes will cause an upward shift in the consumption function. If along with the reduction in taxes, the gocvernment expenditure will remain unchanged, aggregate demand curve C + I + G will shift upward due to rise in consumption function curve. This will have an expansionary effect and the economy will be lifted out of recession, the national income and employment will increase and as a result unemployment will be reduced.

The effect of reduction in taxes in curing recession and in causing expansion in income and output can be graphically shown in the above figure 1. In case of reduction in taxes, instead of increase in government expenditure G, it is increase in consumption C which will cause upward shift in the aggregate demand curve (C + I + G) and will result in, a higher level of equilibrium national income.

Fiscal policy to control Inflation

When due to large increase in consumption demand by the households or investment expenditure by the entrepreneurs, or bigger budget deficit caused by too large an increase in government expenditure, aggregate demand increases beyond what the economy can potentially produce by fully employing its given resources, it gives rise to the situation excess demand which results in inflationary pressures in the economy. This inflationary situation can also arise due to large increase in money supply in the economy.

Under such circumstances anticyclical fiscal policy calls for reduction in aggregate demand.

The fiscal policy measures to control inflation are,

1. Reducing government expenditure
2. Increasing taxes.

The reduction in government expenditure will help in checking inflation is shown in the following figure.

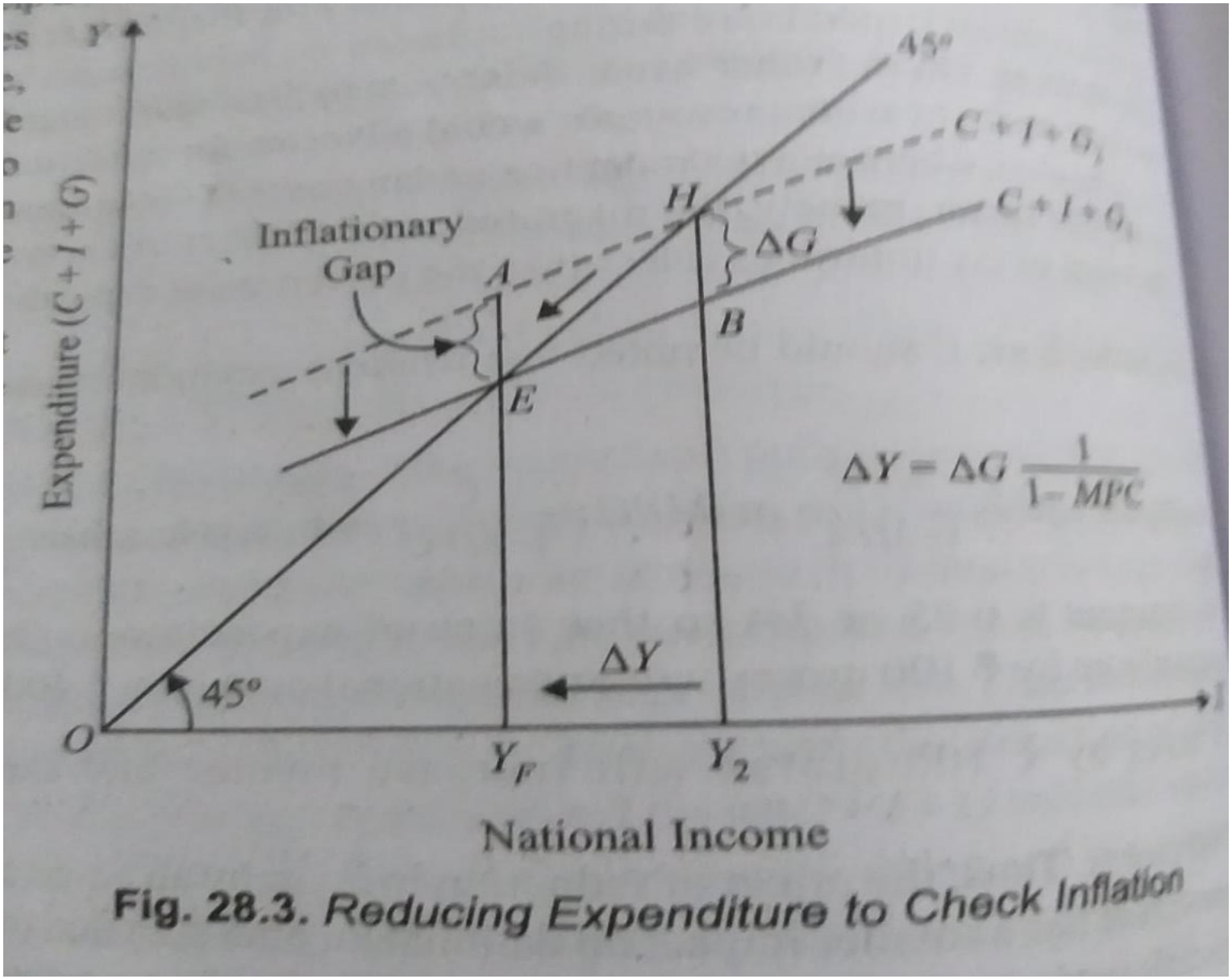


Fig. 28.3. *Reducing Expenditure to Check Inflation*

In this figure the aggregate demand curve $C+I+G_1$ intersects 45^0 line at point E and determines equilibrium national income at full employment level of income Y_F. Due to excessive government expenditure and a large budget deficit, the aggregate demand curve shifts upward to $C+I+G_2$, this will determine Y_2 level of income which is greater than full employment or potential output level Y_F. While the economy does not have labour, capital and other resources sufficient to produce Y_2 level of income or output , the households, businessmen and government are demanding Y2 level of output.

The increase in aggregate demand beyond the full employment level of output to $C+I+G_2$ causes excess demand equal to EA to emerge in the economy. This excess demand EA relative to full employment output Y_2 causes the price level to rise and creates inflationary situation in the economy. This is called inflationary gap. This inflationary gap can be reduced by fiscal policy by reducing government expenditure or raising taxes.

With the equlibrium at point H and the national income equal to Y_2, if government expenditure equal to HB is reduced, aggregate demand curve will shift downward to $C+I+G_1$ which will restore the equilibrium at the full employment level Y_F. From this figure it is seen that the decrease in government expenditure by HB has led to much bigger decline in output by Y_2Y_F.

Raising taxes to control inflation

As an alternative to reduction in government expenditure, the taxes can be increased to reduce aggregate demand. For this purpose especially personal direct income tax, wealth tax, corporate tax can be raised. The hike in taxes reduce the disposable income and therefore there will be reduction in consumption demand. It is shown in the above figure, decrease in consumption C causes the aggregate demand curve C+I=G2 shift downward.

Non-discretionary fiscal policy: Automatic stabilizers

In this non-discretionary fiscal policy, the tax structure and expenditure pattern are so designed that taxes and government spending vary automatically in appropriate direction with the changes in the national income. These taxes and expenditure pattern without any special deliberated action by the government and parliament automatically raise aggregate demand in times of recession and reduce aggregate demand in times of boom and inflation and thereby help in ensuring economic stability. These fiscal measures are therefore called automatic stabilizers or built in stabilizers.

Effectiveness of Fiscal policy

The critics of Keynesian theory has pointed out that expansionary effect of fiscal policy is not as much as Keynesian economists suggest. In the keynesian theory it is asserted that when government increases its expenditure without raising taxes or when it reduce taxes without changing expenditure, it will have a large expansionary effect on national income. In otherwards the deficit budget would ;lead to large increase in aggregate demand and three by help in expand national income and output. It has been argued that increase in government expenditure or creation of budget deficit adversely affect private investment which offsets to a good extent the expansionary effect of budget deficit. This adverse effect comes about as increase in government expenditure or reduction in taxes causes rate of interest goes up.

There are two ways in which rise in rate of interest is explained, 1. within the framework of Keynesian theory increase in government expenditure leads to rise in national output which rises the transaction demand for money will cause the rate of interest to go up. 2. In order to finance its budget deficit the government will borrow funds from the market. This will raise the demand for loanable funds which will bring about rise in rate of interest.

The rise in rate of interest will discourage private investment. Thus increase in government expenditure or fiscal policy of budget deficit crowds out private investment. The magnitude of crowding out effect depends on elasticity of the investment demand. If the investment demand is more elastic , the decrease in private investment consequent to the rise in rate of interest will greatly offset the expansionary effect of the increase in government expenditure. If the investment demand is relatively inelastic, the rise in rate of interest will lead to only small decline in private investment and therefore crowding out effect will be relatively small.

the magnitude of crowding out effect weakens the effectiveness of fiscal policy. The crowding out effect of expansionary fiscal policy and its effect on national output and employment is shown in the following figure.

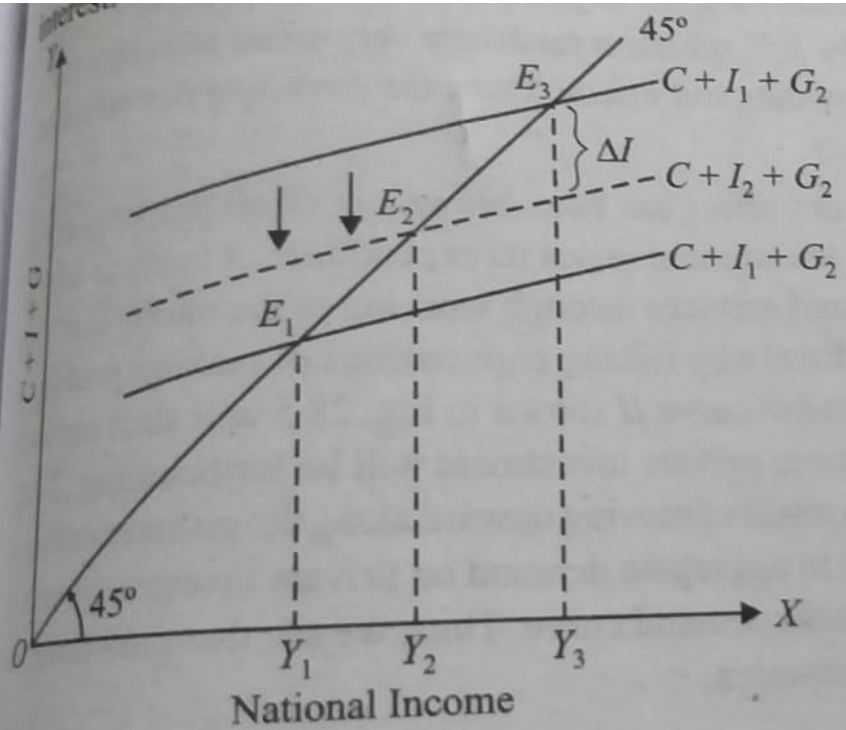


Fig. 28.4. *Effect of Crowding Out on National Output or Income*

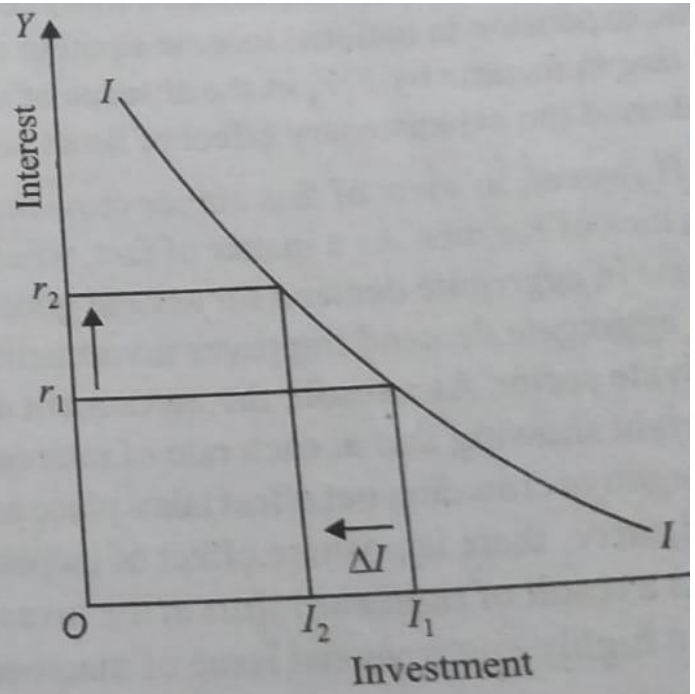


Fig. 28.5. *Crowding Out of Private Inves*

The economy is in equilibrium at Y_1 level of income where aggregate demand curve $C+I_1+G_1$ intersects at 45^0 line and determines Y_1 level of income. Let us assume that this is much below the potential or full employment level of output. Suppose in order to raise the level of national income and output, the government raises its expenditure from G_1 to G_2 so that the aggregate demand curve shifts upward to the new position $C+I_1+G_2$ which intersects 45^0 line at point E_3. With increase in government expenditure national income will raise by ΔG X multiplier, that is ΔG[1/-MPC]. In the absence of crowding out effect, national income will raise to Y_3. This change in national income, Δy or by Y_1Y_3 is equal to the increase in government expenditure (G) times the value of multiplier 1/1-MPC.

The increase in government or the creation of budget deficit causes the rate of interest to rise from r_1 to r_2. It will seen from the above figure that the rise in interest from r_1 to r_2, private investment decreases from I_1 to I_2. So the aggregate expenditure curve shift below to the new lower position $C+I_2+G_2$(dotted), new equilibrium is reached at Y2 level of income. Thus, net result of increase in government expenditure (ΔG) and crowding out of private investment equal to I_1I_2or ΔI is the expansion in national income equal to only Y_1Y_2 which is relatively small as compared to the rise in income Y_1Y_2 in the absence of crowding out effect. Thus the crowding out effect has weakened the expansionary effect of fiscal policy.

Economic Stabilisation
Monetary Policy

Monetary policy is another important instrument with which objectives of macroeconomic policy can be achieved. It is worth noting that it is the Central Bank of a country which formulates and implements the monetary policy in a country. In some countries such as India the Central Bank (the Reserve Bank is the Central Bank of India) works on behalf of the government and acts according to its directions and broad guidelines.

In a developing country like India, in addition to achieving equilibrium at full employment or potential output level, monetary policy has also to promote and encourage economic growth both in the industrial and agricultural sectors of the economy. Thus in the context of developing countries the following three are the important objectives or goals of monetary policy.

1. To ensure economic stability at full employment or potential level of output.
2. To achieve price stability by controlling inflation and deflation,
3. To promote and encourage economic growth in the economy.

Tools of monetary policy

There are four major tools or instruments of monetary policy which can be used to achieve economic and price stability

1. Open market operations
2. Changing the bank rate
3. Changing the cash reserve ratio, and
4. Undertaking selective credit controls.

Expansionary Monetary policy to cure recession or depression

Three monetary policy measures are adopted to cure recession and to establish the equilibrium of national income at full employment level of output.

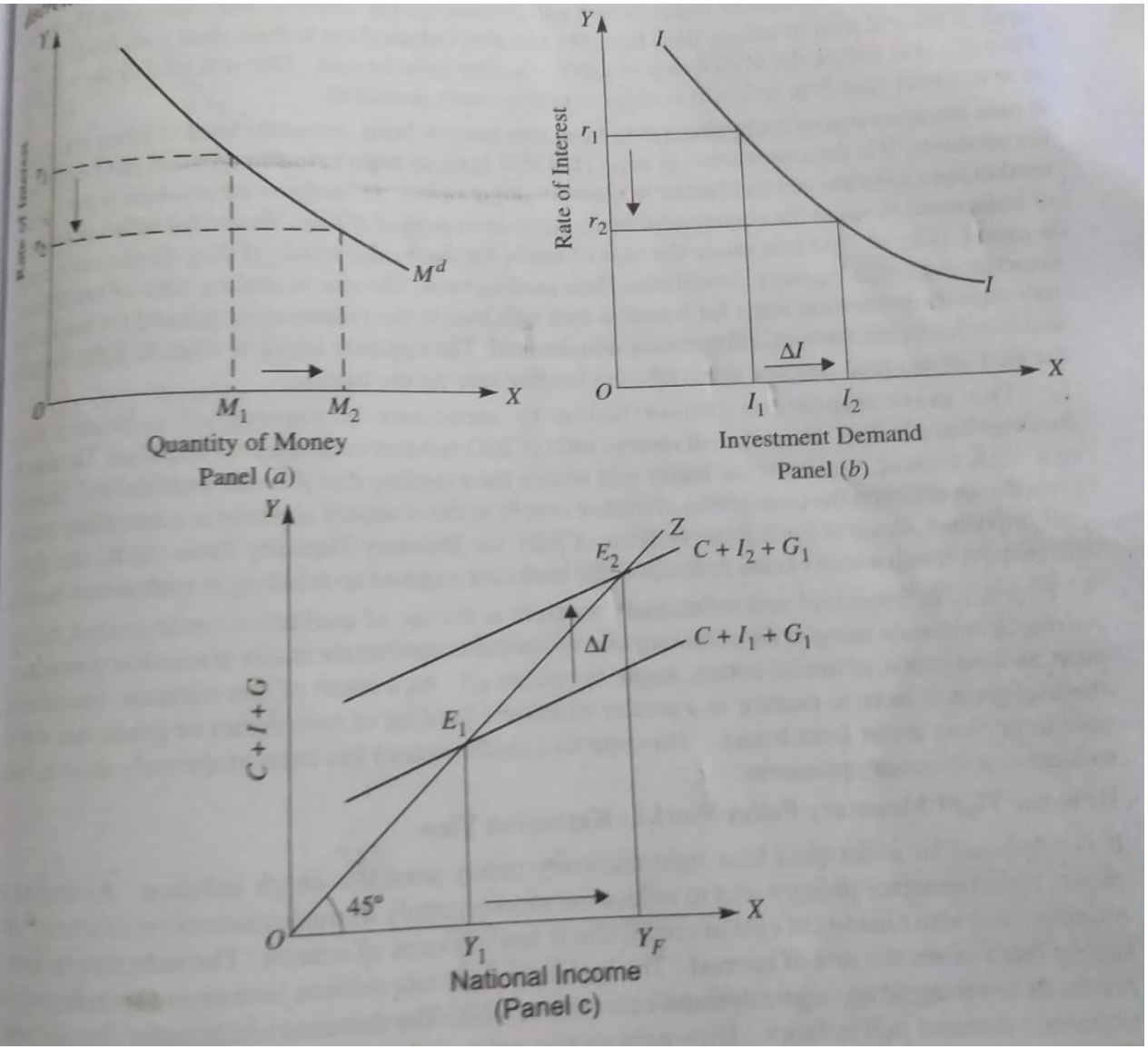
1. The central bank undertakes open market operations and buy securities in the open market. It will lead to increase the reserves of banks with the general public. With greater reserves, commercial banks can issue more credit to the investors, this will lead to more private investment and cause aggregate demand curve shift upward. Thus buying of securities will have an expansionary effect.
2. The Central bank may lower the bank rate or the discount rate, which is the rate of interest charged by the central bank of the country on its loans to commercial banks. At a lower bank rate the commercial banks will borrow more from the central bank and will be able to issue more credit at lower rate of interest to the investors. This will increase the availability of credit and money supply in the economy. The expansion in money supply will increase the investment demand which will lead to increase in aggregate output and income.
3. The central bank may reduce the cash reserve ratio (CRR) to be kept by commercial banks. In countries like India this is the most effective and direct way of expanding credit and increasing money supply in the economy by the central bank. With lower reserve requirements a large amount of funds is released for providing loans to businessmen. As a result credit expands and investment increases in the economy which had an expansionary effect on output and employment.

Similar to the CRR, in India there is another monetary instrument , namely Statutory Liquidity Ratio (SLR) used by the reserve bank to change the lending capacity and therefore credit availability in the economy. According to SLR, in addition to CRR banks have to keep a certain minimum portion of their deposits in the form of some specified liquid assets such as government securities. To increase the lending resources of the banks, Reserve Bank can lower this SLR then credit availability for the private sector will increase.

Working of Expansionary Monetary Policy: Keynes View

In the Keynes' theory rate of interest is determined by the demand for and supply of money. According to Keynesian theory, expansion in money supply causes the rate of interest to fall. And this will encourage the businessmen to borrow more for investment. Thus fall in the rate of interest raises the investment expenditure which is the important component of aggregate demand. The increase in aggregate demand causes expansion in aggregate output, national income and employment.

According to Keynesian view , expansion in money supply can help to cure recession is illustrated in the following figure.


Y
r_1
r_2
M^d
O
M_1
M_2
X
Quantity of Money
Panel (a)
Y
I
Rate of Interest
r_1
r_2
I
ΔI
O
I_1
I_2
X
Investment Demand
Panel (b)
Y
Z
E_2
$C + I_2 + G_1$
ΔI
$C + I_1 + G_1$
E_1
C + I + G
45°
O
Y_1
Y_F
X
National Income
(Panel c)

In a panel (a) of the above figure, it will be seen that when as a result of some measures taken by the central bank, the money supply increases from M_1 to M_2, the rate of interest falls from r_1 to r_2.

It will be seen from panel (b) that with this fall in rate of interest, investment increases from I_1 to I_2. Now, in panel (c), increase in investment expenditure from I_1 to I_2 shift the aggregate demand curve ($C+I_1+G$) upward, so that the new aggregate demand curve $C+I_2+G$ intersects the 45^0 line at point $E_2$and thus establishes equilibrium at full employment output level Y_F. Thus it is clear that the monetary policy can play an important role in stimulating the economy and ensuring stability at full employment level. In fact, Keynes himself was of the view that in times of depression, monetary policy will be ineffective in the revision of the economy and therefore he laid stress on the adoption of fiscal policy to overcome depression.

Tight Monetary policy to Control Inflation

When aggregate demand rises sharply due to large consumption and investment expenditure or more importantly, due to large increase in government expenditure relative to its revenue resulting in huge budget deficits, a demand-pull inflation occurs in the economy.

To check the demand-pull inflation, the adoption of contractionary monetary policy which is popularly called tight monetary policy is called for.

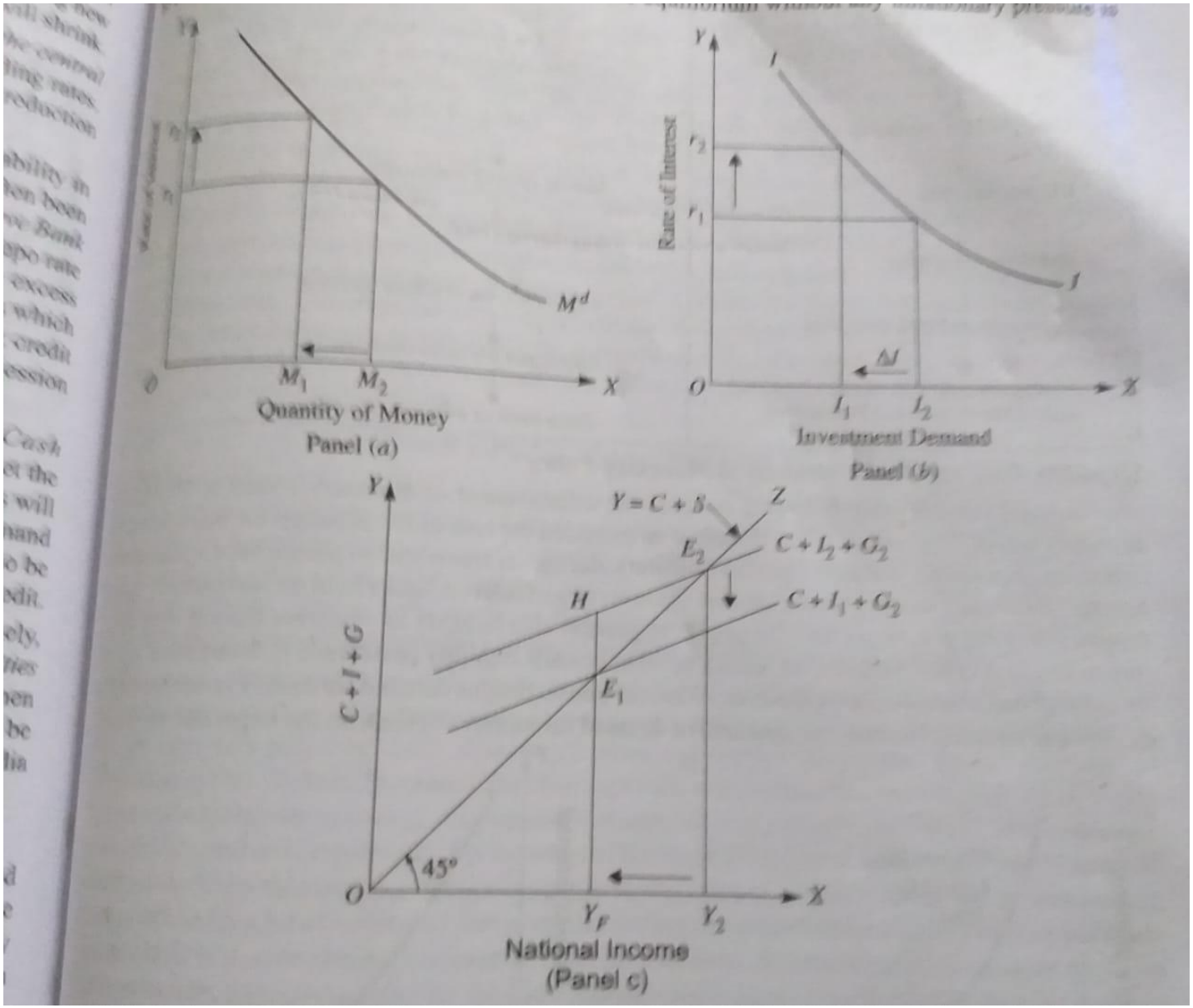
tight or restrictive money policy is one which reduces the availability of credit and also rises its cost. The following monetary measures which constitute tight money policy are generally adopted to control inflation.

1. The Central Bank sells the government securities to the banks, other depositary institutions and the general public through open market operations. This will reduce the reserve with the banks and liquid funds with the general public. The lending capacity of banks will be reduced as a result money supply in the economy will shrink.
2. The bank rate may also be raised which will discourage the banks to take loans from the cntral bank. This will tend to reduce their liquidity and also induce them to raise their own lending rates. This will lead to reduction in investment and help in reducing inflationary pressures.

3. The most important anti-inflationary measure is raising of Statuary Cash Reserve Ratio(CRR). Rise inn CRR reduces cash reserves of banks. To meet the higher reserve requirements, banks will reduce their lending, this will have a direct effect on the contraction of money supply in the economy and help in controlling demand-pull inflation.
4. The next important anti-inflationary measure is the use of qualitative credit control, namely, raising of minimum margins for obtaining loans from banks against the stocks of sensitive commodities such as food grains oil seeds, cotton, sugar, vegetable oil. This selective credit control has been extensively used in India to control inflationary pressures.

Working of Tight Monetary Policy: Keynes view

Tight money policy seeks to reduce the money supply through contraction of credit in the economy and also raising the lending rates of credit. The higher interest rate reduces the investment which results in lowering aggregate demand curve (C+I+G). How tight money policy help in checking inflation is explained in the following figure.


Y
r_2
r_1
M^d
O
M_1
M_2
X
Quantity of Money
Panel (a)
Y
I
Rate of Interest
r_2
r_1
J
O
ΔI
I_1
I_2
X
Investment Demand
Panel (b)
Y
Y = C + S
Z
E_2
$C + I_2 + G_2$
H
$C + I_1 + G_2$
E_1
C + I + G
O
45°
Y_F
Y_2
X
National Income
(Panel c)

Let us assume that full-employment level of national income is Y_F as shown in panel (c) of the above figure. Now, if due to large budget deficit and excessive creation of money supply aggregate demand curve shift to $C+I_2+G_2$, inflationary gap of E_1H comes to exist at full employment level. That is the sum of consumption expenditure, private investment spending and government expenditure exceeds the full employment level of output by E_1H. This creates a demand pull inflation causing rise in prices. Though with aggregate demand curve $C+I_2+G_2$ equilibrium reaches at point E_2 and as a result national income increases but only in money terms, real income or output level remaining constant at O Y_F.

It will be seen from panel (b) that if tight money policy succeeds in reducing money supply from M_2 to M_1 the rate of interest will rise from r_1 to r_2 and also it shows that at a higher interest rate r_2, private investment falls from I_2 to I_1. This reduction in investment expenditure shifts aggregate demand curve $C+I_2+G_2$ downward to $C+I_1+G_1$ and in this way inflationary gap is closed and equilibrium at full employment output level Y_F is once again established.

To sum up, Keynesian view of how expansionary and contractionary monetary policies work to achieve the twin goals of price stability and equilibrium at full employment level of output is shown in the following table.

Monetary Policy : Keynesian View

Expansionary Monetary Policy

Problem : Recession and Unemployment

Measures: (1) Central Bank buys securities through open market operations

(2) It reduces cash reserve ratio (CRR)

(3) It lowers bank rate or repo rate

↓

Money supply increases

↓

Interest rate falls

↓

Investment increase

↓

Aggregate demand increases

↓

Aggregate output increases by a multiple of the increase in investment

Tight Monetary Policy

Problem : Inflation

Measures: (1) Central Bank sells securities through open market operations

(2) It raises Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR)

(3) It raises Bank Rate or repo rate

(4) It raises maximum margin against holding of stocks of goods.

↓

Money Supply decreases

↓

Interest rate rises

↓

Investment expenditure declines

↓

Aggregate demand declines

↓

Price level or inflation rate falls

UNIT – II
Post Keynesian Demand for Money

Patinkin's Real Balance Effect

According to Patinkin, the real balance effect implies that people do not suffer from 'money illusion'. ... This means that a doubling of the quantity of money will lead to a doubling of the price level, but relative prices and the real balances will remain constant and the equilibrium of the economy will not be changed.

The homogeneity hypothesis states that the demand and supply of goods are pretentious only by relative prices. It means that a doubling of money prices will have no effect on the demand and supply of goods. Arithmetically the demand and supply functions for goods are standardised of degree zero in prices alone.

Therefore this homogeneity hypothesis precludes the price level from affecting the goods market as well as the money market. Patinkin criticises this hypothesis for its failure to have any determinate thesis of money and prices.

Another closely related presumption which Patinkin criticises is the discrimination of the goods and money in the neo-classical study. This dichotomisation means that the relative price level is determined by the demand and supply of money.

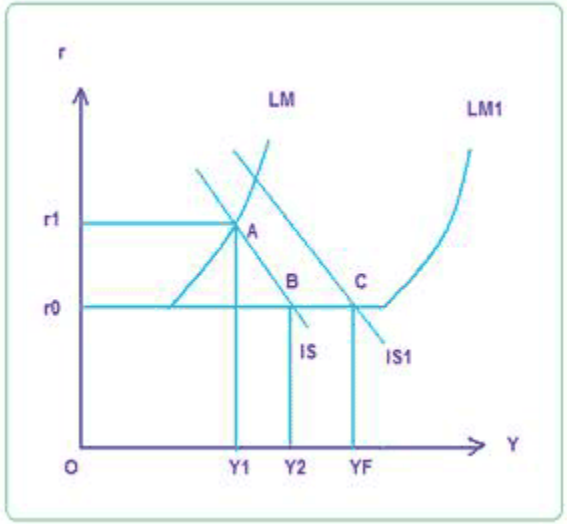
Similar to the homogeneity hypothesis, this presumption also implies that the price level has completely no effect on the monetary segment of the financial system and the level of monetary prices in turn has no effect on the real segment of fiscal system.

After reproaching the neo-classical presumptions outlined above, Patinkin puts together the money market and the goods market of the fiscal system which is based not only on associative prices but also on actual balances. Actual balances mean the original purchasing power of the stock of cash holdings of the people.

When the price level variations, it affects the purchasing power of people's cash holdings which in turn, affects the demand and supply of goods. This is the real balance effect Patinkin denies the subsistence of the homogeneity hypothesis and the dichotomisation presumption through this effect. For this Patinkin introduces the stock of real balances (M/P) held by society as an authority on their demand for goods.

Therefore, the demand for a commodity diminishes the real balances of the people who will spend less than before. This implies a fall in the demand for goods and the consequent fall in prices and wages. The price decline increases the value of money balances held by the people which in turn mount the demand for goods directly.

The initial decline in commodity demand creates a state of involuntary redundancy. But redundancy will not last indefinitely for the reason that as wages and prices drop, the actual balance effect is likely to hike commodity demand directly and indirectly through the interest rate.


r
LM
LM1
r1
A
B
C
r0
IS
IS1
Y
O
Y1
Y2
YF

With sufficiently large drop in wages drop in remuneration and prices the full employment level of productivity and earnings will be restored. Finally, even if there is the employment level of productivity can be restored through the function of the real balance effect – react on the commodity markets and therefore on relative prices.

- The real balance effect is represented diagrammatically by using the IS and LM technique for the reason that the IS curve represents the goods market and the LM curve the money market.
- To start with we take a condition when the fiscal system in symmetry ay OY1 level of earnings when the IS and LM curves interconnect at point A where the overlap rate if Or1.
- Presuming OYF as the full employment is measured by Y1 – YF which causes wages and prices to drop simultaneously.
- This results in a hike in the real value of people's money holdings which transfers the LM curve to the right to LM1. It overlaps the IS curve at point B the earnings level OY2 with the result that the interest rate drops to Or0 which inspires investment, discourages savings and enhances consumption.
- Even when the interest rate drops to its minimum level Or0 the level of demand in the commodity market as represented by the IS curve is not high enough to tend the fiscal system to the full employment level OYF.
- Rather, redundancy tends to a further drops in wages and prices and to the hike in demand for consumption goods which transfers the IS curve to the right to IS1 so that it overlaps the LM1 curve at point C at the full employment level OYF.
- Therefore, under stipulations of remuneration and price flexibility when the fiscal system to the full employment level, even in the liquidity entrap condition as represented above when investment is interest inelastic.

Conclusion

Therefore, the real balance effect reveals three theoretical points: first, it diminishes the classical dichotomy among value and monetary theory, second it validates the conclusions of the quantity thesis that in symmetry, money is neutral and the interest rate is independent of the quantity of money through the real balance effect and third, the wage price flexibility tends to full employment in the long run and that the Keynesian underemployment symmetry is a dissymmetry condition.

Tobin's Portfolio Approach To Demand For Money

An American economist, James Tobin, in his important contribution explained that rational behavior on the part of the individuals is that they should keep a portfolio of the assets which consists of both bonds and money. In his analysis he makes a valid assumption that people prefer more wealth to less.

According to Tobin, faced with various safe and risky assets, individuals diversify their portfolio by holding a balanced combination of safe and risky assets. According to Tobin, individual's behavior shows risk aversion. That is, they prefer less risk to more risk at a given rate of return. In Keynes's analysis, an individual holds his wealth in either all money or all bonds depending upon his estimate of the future rate of interest. But, according to Tobin, individuals are uncertain about future rate of interest.

On the other hand, a person who, in his portfolio of wealth, holds only safe and riskless assets such as money (in the form currency and demand deposits in Bank) he will be taking almost zero risk but will also be having no return and as result there will be no growth of his wealth. Therefore, people generally prefer a mixed diversified portfolio of money, bonds and shares, with each person opting for a little different balance between riskiness and return.

Tobin derived his liquidity preference function depicting relationship between rate of interest and demand for money (that is, preference for holding wealth in money form which is a safe and riskless assert). He argues that with the increase in the rate of interest (i.e. rate of return on bonds), wealth holders will be generally attracted to hold a greater fraction of their wealth in bonds and thus reduce their holding of money. That is, at a higher rate of interest, their demand for holding money (i.e. liquidity) will be less and therefore they will hold more bonds in their portfolio. On the other hand, at a lower rate of interest they will hold more money and less bonds in their Portfolio.

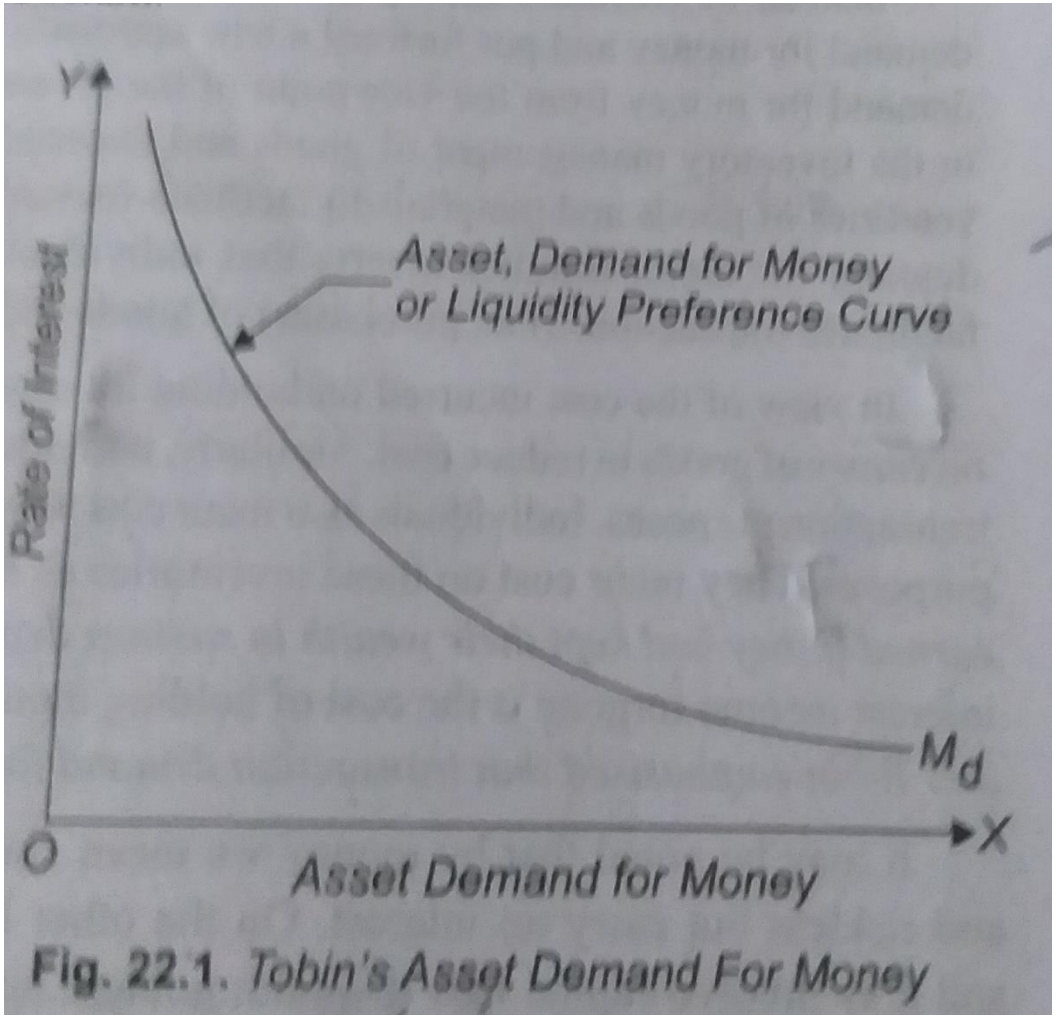


Fig. 22.1. *Tobin's Assot Demand For Money*

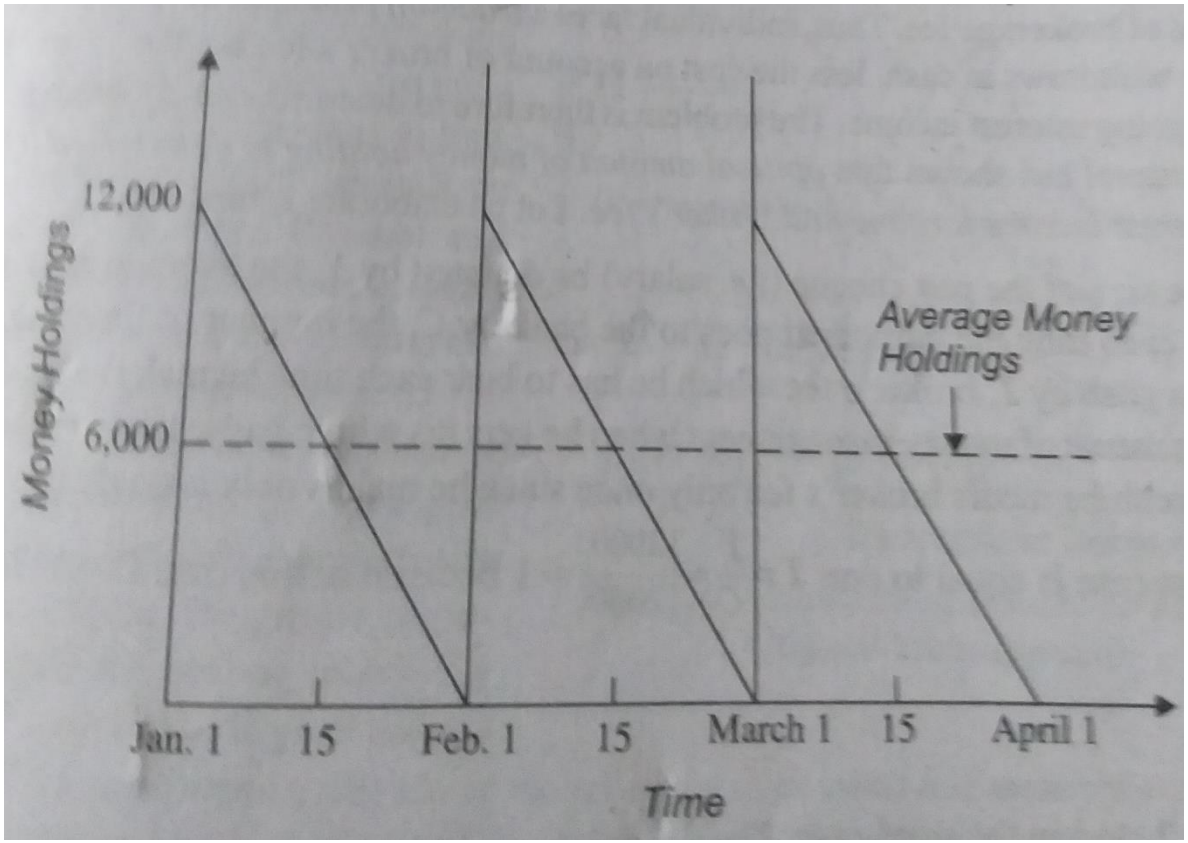
In Tobin's portfolio approach demand function for money as an assert (i.e., his liquidity preference function curve) slopes downwards as in the above figure, where on the horizontal axis assert demand for money is shown. This downward-slopping liquidity preference function curve shows that the asset demand for money in the portfolio increases as the rate of interest for bonds fall. In this way Tobin derives the aggregate liquidity preference curve by determining the effects of changes in the interest rate on the asset demand for money in the portfolio of individuals. Tobin's liquidity preference theory has been found to true by the empirical studies conducted to measure interest elasticity of the demand for money as an asset.

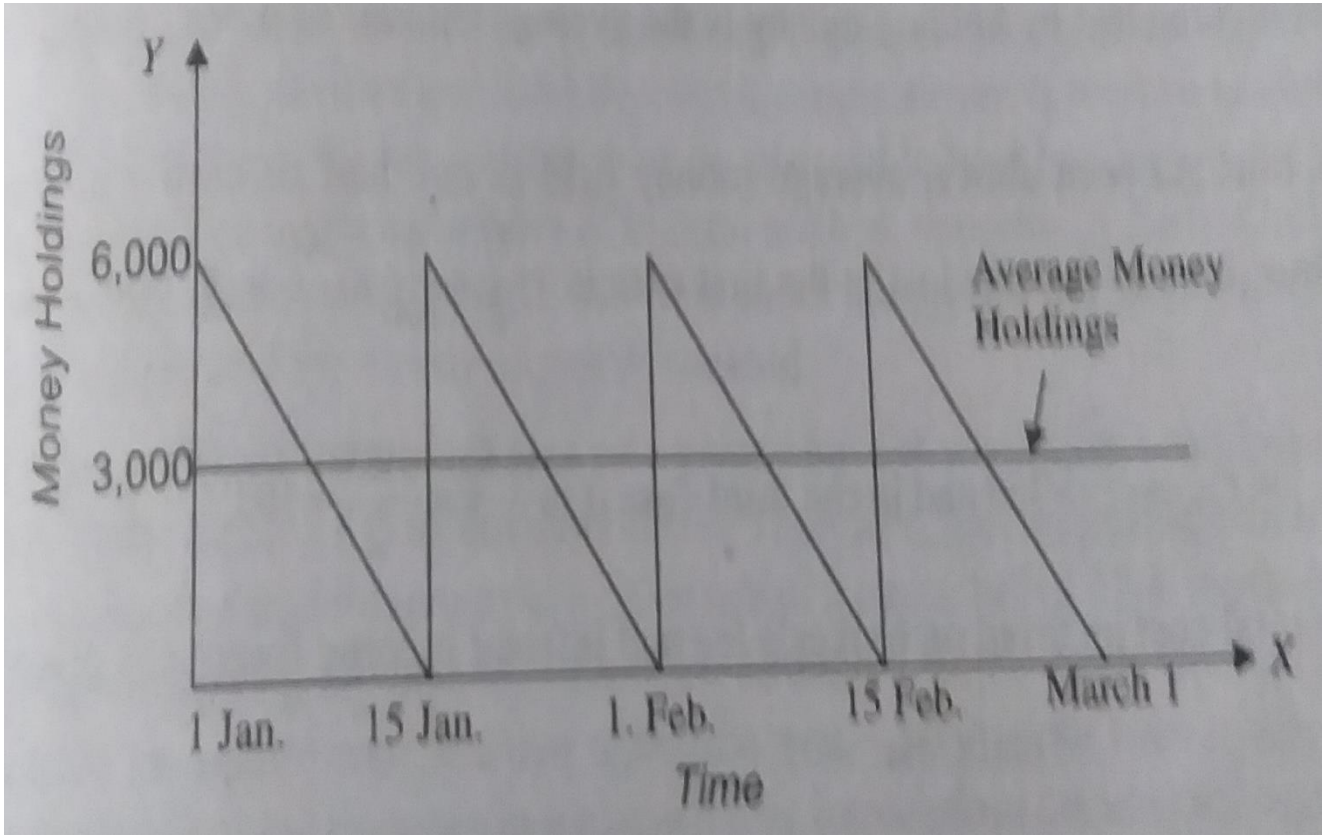
Baumol's Inventory Approach to Transaction Demand For Money

Baumol concentrated on the transactions demand for money and put forward a new approach to explain it. Baumol explains the transaction demand for money from the viewpoint of the inventory control or inventory management similar to the inventory management of goods and materials by business firms. As businessmen keep inventories of goods and materials to facilitate transactions or exchange in the context of changes in demand for them, Baumol asserts that individuals also hold inventory of money because facilitates transaction (i.e. purchases) of goods and services.

In the view of cost incurred on holding inventories of goods there is need for keeping optimal inventory of goods to reduce cost. Similarly, individuals have to keep optimum inventory of money for transaction purposes. Individuals also incur cost when they hold inventories of money for transactions purposes. Baumol and Tobin emphasized that transaction demand for money is not independent of the rate of interest.

Unlike Keynes both Baumol and Tobin argue that transactions demand for money depends on the rate of interest. People hold money for transaction purposes "to bridge the gap between the receipt of income and its spending". As interest rate on savings deposit goes up people will tend to shift a part of their money holdings to the interest-bearing saving deposits.


12,000
6,000
Money Holdings
Average Money Holdings
Jan. 1
15
Feb. 1
15
March 1
15
April 1
Time


Y
Money Holdings
6,000
3,000
Average Money Holdings
X
1 Jan.
15 Jan.
1. Feb.
15 Feb.
March 1
Time

Baumol's Analysis of Interest-Responsiveness of Transaction Demand

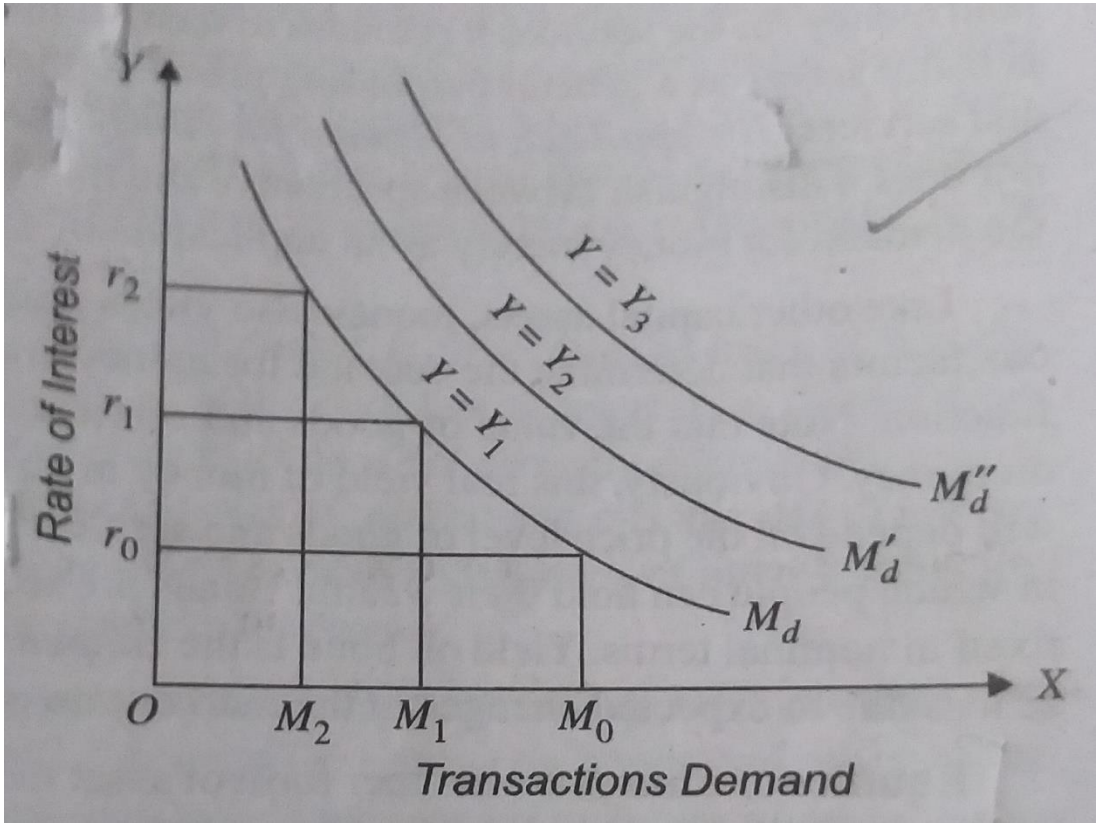
Baumol analyses the transaction demand for money of an individual who receives income at a specified interval, say every month, and spends it gradually at a steady rate. This illustrated in the above figure. It is assumed that the individual is paid Rs.12000 salary check on the first day of each month. Suppose he gets it cashed (i.e. converted into money) on the very first day and spends it gradually daily throughout the month (Rs.400 per day) so that at the end of the month he is left with no money. It can be easily seen that his average money holding in the month will be Rs = 12000/2 = Rs. 6000 (before 15^{th} of a month he will be having more than Rs.6000 and after 15^{th} day he will have less than Rs. 6000). Average holding of money is equal to Rs.6000 which has been shown by the dotted line.

The individual is losing interest which he could have earned if he had deposited some funds in interest-bearing savings deposits instead of withdrawing all his salary in cash on the first day of the month. He can manage his money balances so as to earn some interest income as well. Suppose, instead of withdrawing his entire salary on first day of the month, he withdraws only half of it i.e. (Rs.6000 in cash and deposits the remaining amount in the savings account which gives him interest of 5 percent), his expenditure per day remaining constant at Rs.400. This is shown in the figure above. It will be seen that his money holdings of Rs.6000 will be reduced to zero at the end of the 15^{th} day of each month. Now, he can withdraw Rs.6000 on the morning of 16^{th} of each month and then spends it gradually, at a steady rate of Rs.400 per day for the next 15 days of a month. This is a better method of managing funds as he will be earning interest on Rs.6000 for 15 days in each month. Average money holdings in this money management scheme is Rs 6000/2=3000.

Likewise, the individuals may decide to withdraw Rs.4000 (i.e. 1/3rd of his salary) on the first day of each month and deposits Rs.8000 in the saving deposits. His Rs.4000 will be reduced to zero, as he spends his money on transactions (that is, buying of goods and services) at the end of the 10th day and on the morning of 11th of each month he again withdraws Rs.4000 to spend on goods and services till the end of the 20th day and on 21st day of the month he again withdraws Rs.4000 to spend steadily till the end of the month. In this scheme on an average he will be holding Rs.4000/2 = 2000 and will be investing funds in savings deposits and earn interest o them. Thus, in this scheme he will be earning more interest income.

Baumol has shown that average amount of cash withdrawal which minimizes cost is given by $C = \sqrt{\frac{2bY}{r}}$.

This means that average amount of cash withdrawal which minimise cost is the square root of the two times broker's fee multiplied by the size of individual's income (Y) and divided by the interest rate. This is generally referred to as Square Root Rule.


Y
Rate of Interest
r_2
r_1
r_0
$Y = Y_3$
$Y = Y_2$
$Y = Y_1$
M''_d
M'_d
M_d
O
M_2
M_1
M_0
X
Transactions Demand

According to Baumol and Tobin, transactions demand curve for money slopes downward as shown in the above fig. At the higher interest rates, bonds, savings and fixed deposits are more attractive relative to money holding for transactions. Therefore, at higher interest rates people tend to hold less money for transactions purposes. On the other hand, when rates of interest are low, opportunity cost of holding money will be less and, as a consequence, people will hold more money for transactions. Therefore, the curve of transaction demand for money slopes downwards.

It will be observed from the square root rule that transactions demand for money varies directly with the income (Y) of the individuals. Therefore the higher the level of income, the greater the transactions demand for money at a given rate of interest. In the above fig, the three transactions demand curve for money M_d, M_{d}' and M_{d}'', for three different income levels, Y_1, Y_2, Y_3 are shown. It will be known from the square root rule that optimum money holding for transactions will increase less than proportionately to the increase in income. Thus, transactions demand for money, according to Baumol and Tobin, is function of both rate of interest and the level of income.

$$M_{td} = f(r, Y)$$

where M_{td}stands for transactions demand for money, r for rate of interest and Y for the level of income.

Friedman's Theory of Demand for Money

Friedman put forward demand for money function which plays an important role in his restatement of quality theory of money and prices.

Friedman believes that money demand function is most important stable function of macro economics. He treats money as one type of asset in which wealth holders can keep a part of their wealth. Business firms see money as a capital good or a factor of production which they combine with the services of other productive assets or labour to produce goods and services. Thus, according to Friedman, individuals hold money for the services it provides to them.

His approach to demand for money does not consider any motives for holding money, nor does it distinguish between speculative and transactions demand for money. Friedman considers the demand for money merely as an application of a general theory of demand for capital assets.

Besides money, Bonds are another type of asset in which people can hold their wealth. Bonds are securities which yield a stream of interest income, fixed in nominal terms. Yield on bond is the coupen rate of interest and also anticipated capital gain or loss due to expected changes in the market rate of interest.

Equities or shares

These are another form of assets in which wealth can be held. The yield from equity is determined by the dividend rate, expected capital gain or loss and expected changes in the price level. The fourth form in which people can hold their wealth is the stock of producer and durable customer commodities. These commodities also yield a stream of income but in kind rather than in money.

Friedman also considers and explicit yield from commodities in the form of expected rate of change in their price per unit of time.

Friedman's nominal demand function (M_d) for money can be written as

$$M_d = f(W, h, r_m, r_b, r_e, P, \frac{\Delta P}{P}, U)$$

As demand for real money balances is nominal demand for money divided by the price level, demand for real money balances can be written as

$$\frac{M_d}{P} = f(W, h, r_m, r_b, r_e, \frac{\Delta P}{P}, U)$$

where M_d stands for nominal demand for money and $\frac{M_d}{P}$ for demand for real money balances, W stands for wealth of the individuals, h for the proportion of human wealth to the total wealth held by the individuals, r_m for rate of return or interest on money, r_b for rate of interest on bonds, r_e for rate of return on equities, P for price level, $\frac{\Delta P}{P}$ for the change in price level (i.e. rate of inflation), and U for the institutional factors.

Wealth(W):

The major factor determining the demand for money is the wealth of the individual(W). In wealth Friedman includes not only non-human wealth such as bonds, shares, money which yield various rates of return but also human wealth or human capital.

Individual's demand for money directly depends on his total wealth. Indeed, the total wealth of an individual represents an upper limit of holding money by an individual and is similar to the budget constraint of the customer in the theory of demand. The greater the wealth of an individual, the more money he will demand for transactions and other purposes.

Rates of interest or return (r_m, r_b, r_e)

Friedman considers three rates interest, namely, r_m, r_b, r_e, which determine the demand for money. r_m is the own rate of interest on money. Note that money kept in the form of currency and demand deposits dose not earn any interests. But money held as saving deposits and fixed deposits earns certain rates of interest and it is this rate of interest which is designated by r_m in the money demand function.

The opportunity cost of holding money is the interest or return given up by not holding these other forms of assets. The demand for money is negatively related to the rate of interest (or return) on bonds, equities and other such non-money assets.

Price Level (P)

price level also determines the demand for money balances. A higher price level means people will require a larger nominal money balances in order to do the same amount of transactions, that is, to purchase the same amount of goods and services. If income (Y) is used as proxy for wealth (W) which, is the most important determinant of demand for money, then nominal income which is given by Y.P becomes a crucial determinant of demand for money. Here Y stands for real income (i.e. in terms of goods and services) and P for price level. As the price level goes up, the demand for money will rise and, on the other hand, if price level falls, the demand for money will decline. As a matter of fact, people adjust the nominal money balances (M) to achieve their desired level of real money balances $\left(\frac{M}{P}\right)$.

The Expected Rate of Inflation $(\frac{\Delta P}{P})$

If people expect a higher rate of inflation, they will reduce their demand for money holdings. This is because inflation reduces the value of their money balances in terms of its power to purchase goods and services. If the rate of inflation exceeds the nominal rate of interest, there will be negative rate of return on money. Therefore when people expect a higher rate of inflation they will tend to convert their money holdings into goods or other assets which are not affected by inflation. On the other hand, if people expect a fall in the price level, their demand for money holdings will increase.