
UNIT 17 INTEGRATION OF GOODS AND MONEY MARKETS

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17.0 OBJECTIVES

On going through this unit you would be able to explain:

- 1 Goods Market equilibrium;
- 1 Money market equilibrium;
- 1 Integration of Goods and Money markets;
- 1 Situations of disequilibrium in goods and money markets;
- 1 Steps to restore equilibrium;
- 1 Classical approach and its policy implications; and
- 1 Keynesian approach and its policy implications.

17.1 INTRODUCTION

This unit relates to integration of goods and money markets. You have already been introduced to these markets in Units 15 and 16. It has been seen that equilibrium in goods market can be achieved at various combinations of interest rate and national income. Same is the case in respect of money market. In this unit we want to integrate goods and money markets in such a way that we get one combination of interest rate and national income at which both the markets are in equilibrium.

The technique of IS-LM will be employed to integrate goods and money markets. It will also be shown that if there is disequilibrium in both the markets, or in one of these, there exists a mechanism which helps restore equilibrium.

The integration of goods and money markets will also enable you to distinguish between Classical and Keynesian approaches to appreciate the policy implications of each.

17.2 GOODS MARKET EQUILIBRIUM

The goods market equilibrium has already been introduced to you in Unit 15. The equilibrium in goods market or what is termed as real market is achieved where injections are equalized to leakages. Injections consist of autonomous investment, government expenditure and exports, which are taken as autonomous variables. Leakages on the other hand, consist of savings, taxes and imports assumed to be dependent on interest rate or national income. Thus, at various combinations of interest rate and national income we can get different points of equilibrium in goods market. This also helps us to identify the situations of surplus and deficit in goods market.

17.2.1 Constituents of Goods Market

Various constituents of goods market are investment, government expenditure and exports. We are assuming away the flow of foreign capital and also taking price level as given. All these constituents termed as injections are taken as autonomous variables i.e., they are not influenced by national income. Other constituents of goods market are savings, taxes and imports, which are termed as leakages. Saving is taken as an increasing function of national income though interest rate can also influence the level of saving. Taxes are taken to be an increasing function of national income. Sometimes savings are taken to be an increasing function of disposable income, which is defined as national income minus direct taxes. Similarly imports are taken to be an increasing function of national income though we can have elements of imports which may be autonomously given.

17.2.2 Investment-Savings Equality

As you already know from Unit 15, in an economy where there is no government and further if it is a closed economy, i.e., there are no exports and imports an equilibrium in goods market is ensured where (ex-ante or, planned) investment becomes equal to (ex-ante or, planned) savings. This equality, in turn, ensures that aggregate demand in the economy is sufficiently of the level of aggregate supply so that there is no unplanned increase or decrease in inventories. A level of national income where aggregate demand is equal to aggregate supply is termed as equilibrium level of national income, which also indicates equilibrium in goods market.

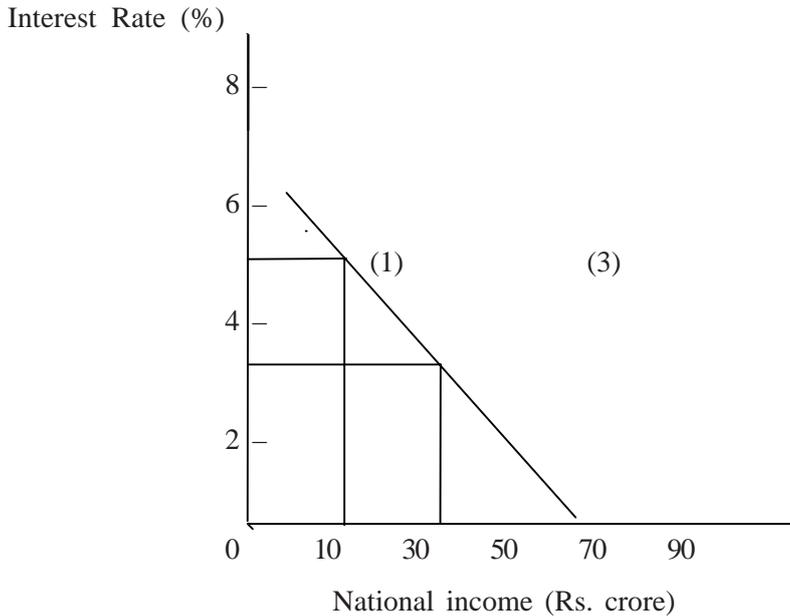
Any other level of national income where investment is not equal to savings (or where aggregate demand is not equal to aggregate supply) represents disequilibrium in goods market. Disequilibrium can be of two types: (1) Surplus in goods market, which represents a situation of aggregate supply being more than aggregate demand, or savings being more than investment and (2) deficit in goods market, which, represents a situation of aggregate supply being less than aggregate demand, or savings being less than investment.

17.2.3 Investment-Savings Equality at Different Combinations of Interest Rate and National Income

Equilibrium in goods market at various combinations of interest rate and national income, as shown in Unit 15 is represented by IS curve. The IS curve represents equality of investment with savings, or equilibrium in goods market,

at various combinations of interest rate and national income is reproduced in Fig. 17.1 for ready reference, to be referred to in Section 17.4.1.

Fig.17.1



In Fig. 17.1: we are recalling the IS curve made in part (d) of the four- part diagram in Unit 15. The vertical axis shows rate of interest in per cent and the horizontal axis shows the level of national income. Each point on IS curve shows equilibrium in goods market.

In Fig. 17.1, national income is measured on X-axis in rupees crore and interest rate in % on Y-axis. On the IS line, at point (1) at 5% interest rate and Rs. 20 crore of national income investment is equal to saving. Similarly at point (2) where 3% is the rate of interest and Rs.40 crore national income, again investment is equal to saving. We can get many other points on IS line at which investment-saving equality will take place. Point (3) indicates surplus in goods market. Similarly point (4) indicates deficit in goods market. In fact all points above IS line indicate surplus and those below IS line show deficit in goods market.

17.3 MONEY MARKET EQUILIBRIUM

Money market equilibrium has already been introduced to you in Unit 16. The equilibrium in money market is achieved where demand for money is equal to supply of money. Supply of money is a stock, which can be measured at a point of time. Demand for money consists of demand for transactionary and precautionary purposes, which are lumped together. The transaction demand for money is represented by M_t . Demand for money also consists of demand for speculative purposes, which is represented by M_{sp} . So, the total demand for money concerning M_t is an increasing function of national income and that of M_{sp} is a decreasing function of interest rate. Thus, at various combinations of interest rate and national income we can get various situations of equilibrium in money market. This also helps us to identify situations of surplus and deficit in money market.

17.3.1 Constituents of Money Market

Constituents of money market are supply of money, demand for money for transactionary and precautionary purposes, and demand for money for speculative purposes. From among these, supply of money is autonomously given. The demand for money for transactionary and precautionary purposes is taken to be an

increasing function of national income. However, demand for money for speculative purposes is a decreasing function of interest rate. At a very low interest rate demand of money for speculative purposes becomes infinite. These constituents of money market are to be considered together to arrive at equilibrium in money market.

17.3.2 Demand-Supply Equality of Money

As known to you from Unit 16 equilibrium in money market is ensured where demand for money is equal to supply of money. This equality, in turn, ensures demand- supply equality of money available for speculation purposes.

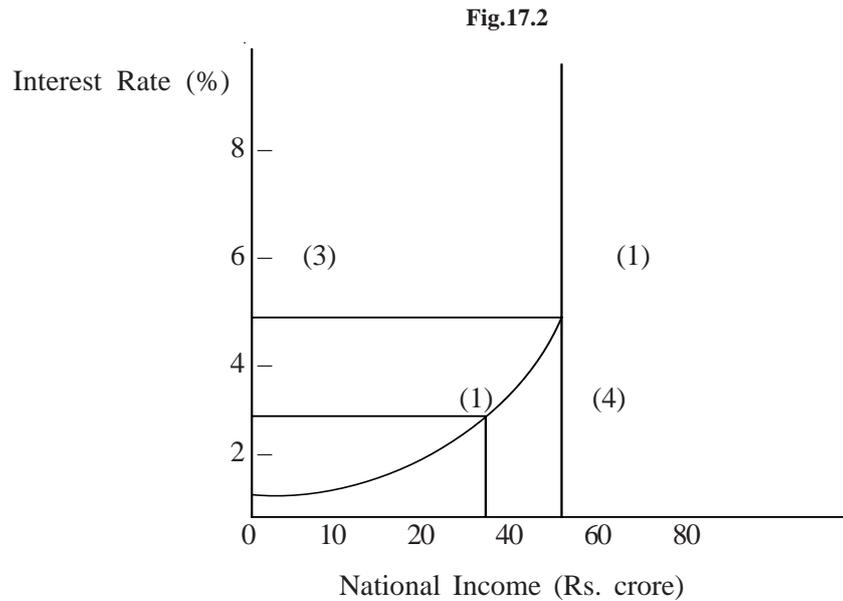


Fig.17.2 is nothing but L M curve designed in Unit 16. Here too we have shown the per cent rate of interest on the vertical and national income on the horizontal axis. Each point on the L M curve shows equilibrium in the money market.

In Fig. 17.2 national income is measured on X-axis and interest rate on Y-axis. On the LM line, at point (1) where the interest of rate is 5% and national income is Rs.45 crore, demand for money (L) is equal to supply of money (M). Similarly at point (2) at 3% interest rate and Rs.40 crore of national income again demand for money is equal to supply of money. We can get many other points on the LM line at which demand-supply equality of money will take place. Point (3) indicates surplus in money market. Similarly point (4) indicates deficit in money market. Disequilibrium in money market is a situation where demand for money is not equal to supply of money. Disequilibrium can be of two types: (1) surplus in money market which is a situation of supply of money being more than demand for money and (2) deficit in money market which represents a situation of supply of money being less than demand for money. This LM curve will be used in Section 17.4 along with the curve of Fig. 17.1 to determine simultaneous equilibrium in both goods and money markets.

17.4 INTEGRATION OF GOODS AND MONEY MARKETS

Integration of goods and money markets involves taking both the markets together against given interest rate and national income. As you already know from sections 17.2 and 17.3 above that goods and money markets are represented by IS and LM curves respectively. An integration of two markets will involve taking

interest rate on Y-axis and national income on X-axis in a two-dimensional diagram and plotting IS and LM curves to get the point of equilibrium. We will also have to work out the mechanism by which equilibrium in one or both the markets is restored in case of a disturbance.

17.4.1 IS and LM at Different Combinations of Interest Rate and National Income

We will make use of the information contained in Figs. of 17.1 and 17.2 and put these together in Fig. 17.3.

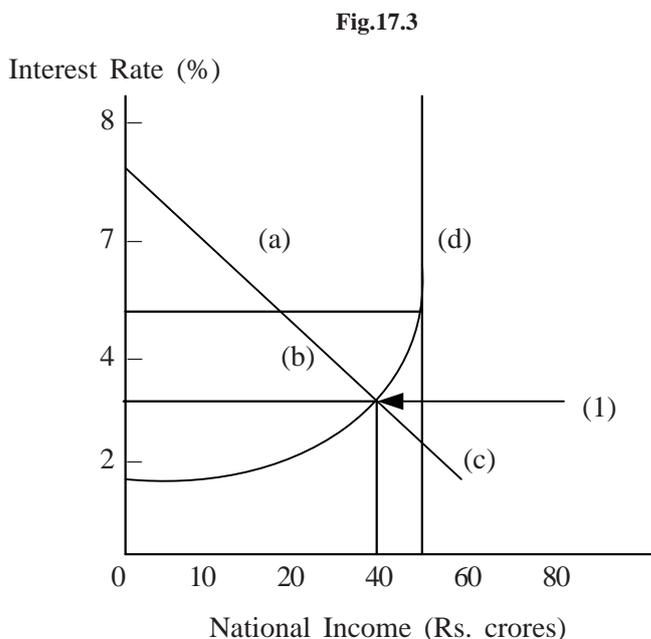


Fig. 17.3: Brings together the Figs. 17.1 and 17.2. The IS curve shows equilibrium in goods market and the LM curve shows that in money market. The point of intersection between these two curves gives us that combination of rate of interest and national income at which both goods and money markets attain equilibrium simultaneously.

The points on IS and LM curves represent equilibrium in goods market and money market respectively at various combinations of interest rate and national income. Region (a) in Fig. 17.3 indicates surplus in goods market as well as in money market. Region (b) indicates a situation of deficit in goods market and surplus in money market. Region (c) is indicative of deficit in goods market as well as deficit in money market. Region (d) gives us surplus in goods market and deficit in money market. It is only at point (1) where IS and LM curves intersect that we have equilibrium in goods market as well as in money market and this simultaneous equilibrium in both the markets is achieved at a combination of interest rate of 3% and national income of Rs. 40 crore. At no other point simultaneous equilibrium in both markets will be achieved.

17.4.2 Steps to Restore Equilibrium in Goods and Money Markets

Let us redraw Fig. 17.3 to spell out the steps to be taken to restore simultaneous equilibrium in goods and money markets. In case of a situation of disequilibrium this will be explained in Fig. 17.4.

Fig.17.4

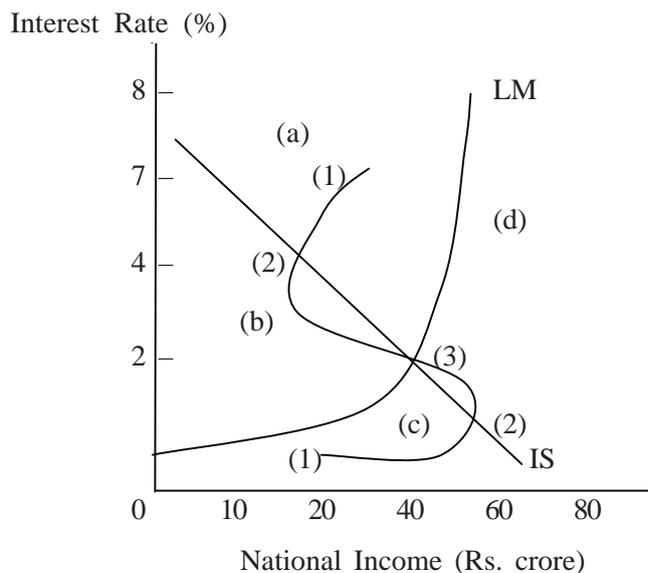


Fig.17.4 Explains that if the economy happens to be away from the point of intersection of IS and LM curves, that is, at any point in the regions (a), (b), (c) or (d) then what steps would restore the equilibrium again.

In Fig. 17.4 the process of restoration of equilibrium from disequilibrium is shown. Let us take point (1) in region (a), which represents a situation of surplus in goods as well as money markets. In order to correct surplus in goods market, we require contractionary fiscal policy, i.e., reducing government expenditure, or autonomous investment, or increasing taxes, or reducing exports. This will lead to a fall in national income. The direction to the left at point (1) indicates reduction of national income. Similarly, to correct surplus in money market we need to reduce interest rate or adopt expansionary monetary policy. The direction downward at point (1) indicates reduction of interest rate. As we go along adopting contractionary fiscal policy and expansionary monetary policy we cross over to region (b). In point (2) is in region (b), we face the situation of deficit in goods market and surplus in money market. In order to correct this situation we start adopting expansionary fiscal policy and expansionary monetary policy, which finally leads us to point (3), which represents simultaneous equilibrium in goods and money markets.

We could have started from point (1') of region (c) representing deficit in goods as well as money markets for which we adopt contractionary monetary policy and expansionary fiscal policy. As we continue pursuing these policies, we reach point (2') of region (d) showing surplus in goods market and deficit in money market. So, from point (1') we move to point (2') adopting contractionary fiscal as well as monetary policy. This leads us finally to point (3) where simultaneous equilibrium in both the markets is attained.

How quickly equilibrium in both the markets is restored depends on slopes of IS and LM curves. If IS curve is steep given the LM curve, i.e., point (3) will be achieved quickly.

Check Your Progress 1

- 1) Refer to Figure 17.4 take a point in region (d) Work out the steps to restore equilibrium point (3).

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2) What is the reason for the LM curve to be parallel to X-axis at a very low level of interest rate?

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3) Distinguish between contractionary monetary and fiscal policies.

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17.5 CLASSICAL APPROACH WITH THE HELP OF IS-LM TECHNIQUE

Using IS-LM technique developed in Section 17.4.1 we can distinguish between classical and Keynesian approaches. The classical economists were of the view that money is demanded only for transactionary purposes. They also maintained that an economy operates always at full employment of income and there cannot exist unemployment because of shortage of aggregate demand. J.B. Say propounded, what is termed as Say's law of market, according to which every supply creates its own demand. In case we assume non-existence of savings, Say's law of market implies that in order to produce more goods and services we require the services of factors of production and for rendering factor services they receive factor incomes. Factor incomes received by factors of production are used to purchase goods and services produced by enterprises. A factor of production is employed upto a point where the remuneration given to it becomes equal to marginal revenue product - as stated by marginal productivity theory of distribution. This way, the sum of factor remunerations adds up to value of total product. Thus, there cannot be shortage of demand. If savings are introduced factor income received by factors of production will be used partly to finance consumption expenditure and partly for savings purposes. Consumption expenditure is used to purchase consumer goods and services and savings are used to finance investment activity. If savings are equal to investment again there cannot be shortage of demand in the economy. Saving-investment equality in classical approach is ensured by interest rate variation and it keeps changing until savings are equalized to investment. Demand for labour is equalized to supply of labour by variation in real wage rate. The working of classical approach can be illustrated with the help of IS-LM technique as shown in Fig. 17.5.

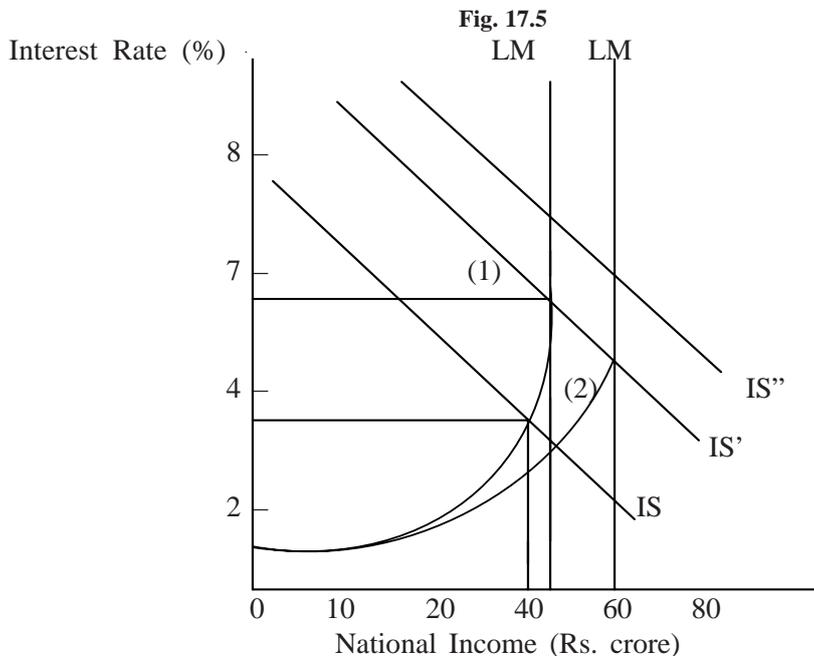


Fig.17.5 tells us that the portion of LM curve, which is parallel to Y-axis conforms to classical approach. In such situation an increase in government expenditure reflected in the right wards shift of IS curve does not lead to any increase in the national income - only rate of interest rises. Here the only way to raise the national income is to expand the supply of money. In other words, the fiscal policy is totally ineffective here. Only the monetary policy can work.

The shape of LM curve beyond point (1) when it becomes parallel to Y-axis is referred to as classical range. The meaning of such a feature is, if investment, or government expenditure rises as shown by shift of IS curve from IS' to IS'' it will result in increase in interest rate from 5% to 7.5% keeping the level of national income at Rs.45 crore. If national income is to be raised from Rs.45 to Rs.55 crores the only way out is to increase the money supply which is shown by shift of LM curve from LM to LM' given the IS' curve.

It can be easily seen that the slope of IS curve matters a lot in determining the effect of monetary policy. If IS curve is steeper than IS' more money supply has to be resorted to achieve a new national income level of Rs.55 crore, or we can put the same thing by saying that monetary policy will be less effective if IS curve is steep. Similarly flatter the IS curve more effective will be the monetary policy.

17.5.1 Policy Implications of Classical Approach

It is time to see the policy implications of the classical approach. Refer to the Fig. 17.5. In this figure we are at equilibrium. The level of national income is Rs.45 crores at which both goods and money markets are in equilibrium. Now, if the full employment level of national income is Rs.55 crore at which resources are fully employed, this can be achieved only by increasing the money supply which is indicated by shift of the LM curve from LM to LM' given the IS curve. The extent of shift of the LM curve to the right will depend on slope of the IS curve. In Fig. 17.5 the IS is given by IS'. The full employment equilibrium level of income is given by the intersection of IS' with LM' at point (2). On the other hand, if IS curve had been steeper than IS' the extent of shift of LM curve would have been more, implying thereby, greater increase in money supply would be required to achieve full employment level of national income.

Thus, we realize immediately that in the classical range when LM curve becomes parallel to Y-axis the only policy, which can work, is to shift the equilibrium level of income. The monetary policy and the fiscal policy, if adopted, would result in change of interest rate. For instance if expansionary fiscal policy

had been adopted, as shown by the shift of IS curve from IS' to IS'', the interest rate would have increased from 5% to 7.5% keeping the level of national income unaffected at Rs.45 crore.

Therefore, monetary policy is the only policy which will be effective in the classical range. The degree of effectiveness of such a policy will depend on the slope of the IS curve. Steeper the IS curve less effective will be the monetary policy or flatter the IS curve more effective will be the monetary policy. The reason why interest rate rises with adoption of expansionary fiscal policy lies in the fact that increase in investment, or government expenditure will result in an increase in national income depending on the value of multiplier. This rise in national income will result in demand for money for transaction purposes. Given the money supply, if demand for money for transaction purposes increases, the supply of money available for speculation purposes falls. This leads to an increase in interest rate. We can also put the same thing by saying that as public investment or government expenditure increases, private investment falls resulting in the operation of "crowding out" effect.

17.6 KEYNESIAN APPROACH WITH THE HELP OF IS-LM TECHNIQUE

Unlike the classical range where LM curve is parallel to Y-axis, we have another extreme where LM curve becomes parallel to X-axis and the demand of money is infinite. Keynesian approach is at its effective best in this range. It has been depicted with the help of Fig. 17.6.

Fig.17.6

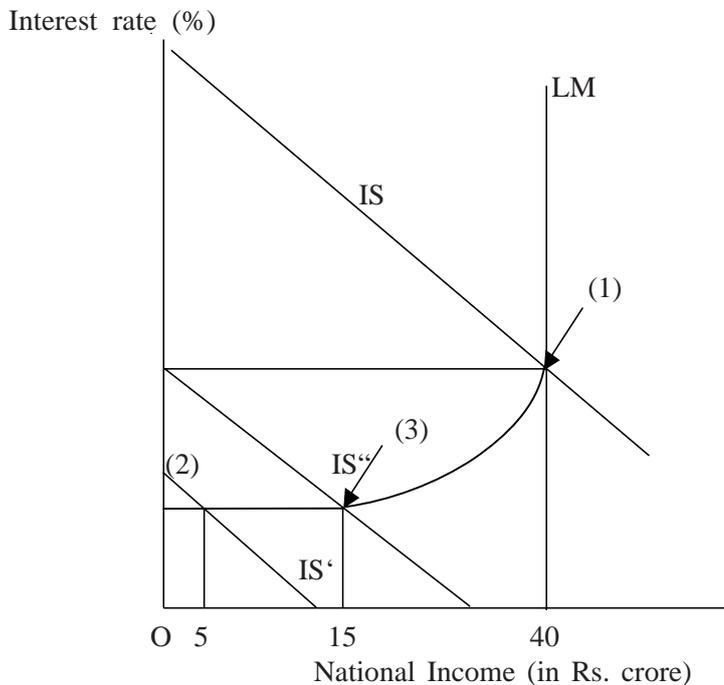


Fig. 17.6: Focuses on that portion of L M curve, which is parallel to X-axis. This is the region in which the Keynesian approach is most effective. The economy is deep in 'liquidity trap' and it does not respond to monetary policy changes. But the fiscal policy works very effectively here.

In Fig. 17.6 IS-LM curves are drawn with their intersection at point (1). At this point interest rate is 3% and national income is Rs.40 crore. At 0.5% interest rate, the LM curve is drawn parallel to X-axis which is also referred to as a

situation of liquidity trap. In this region, demand of money for speculation purposes is infinite. It is called Keynesian range.

In Keynesian range or liquidity trap range, equilibrium level of national income is Rs. 5 crore and 0.5% interest rate. This is shown at point (2). If national income is to be increased from Rs.5 crore to Rs.15 crore it will not be achievable since interest rate of .5% will remain unchanged. On the other hand, the an increase in autonomous investment or government expenditure through multiplier will be in a position to achieve national income of Rs.15 crores. As you already know increase in autonomous investment or government expenditure is reflected by a shift of IS curve to the right. So, in this case, IS curve has to move to the right from IS' to IS'' to increase national income from Rs.5 crore to Rs.15 crore. This shift of IS curve is what is referred to as the adoption of expansionary fiscal policy. Similarly to reduce national income we have to adopt contractionary fiscal policy.

It can be seen that the suitable policy to be adopted in Keynesian range is fiscal policy i.e., the policy of changing government expenditure and for taxation.

17.6.1 Policy Implications of Keynesian Approach

In Fig. 17.6 the initial equilibrium level is given at point (2). If the full employment level of national income is Rs. 15 crore, it can be achieved by increasing autonomous investment or government expenditure or reducing tax revenue which is indicated by the shift of IS curve from IS' to IS'' given that LM curve is parallel to X-axis. It is important to see that the slope of the IS curve is of no consequence in achieving full employment level of income. The full employment equilibrium level of income is given by the intersection of IS'' with LM as represented by point (3).

Thus, in the Keynesian range where LM curve becomes parallel to X-axis, the only policy, which can work to shift equilibrium level of income, is fiscal policy. The monetary policy, if adopted, would be unsuccessful because it operates through changes in rate of interest, which is ineffective here

Another important point to be noted is the “crowding out” effect which was referred to in Section 17.5.1. It will be totally non-existent in Keynesian range. The implication of the non-existence of “crowding out” effect is that full multiplier effect as a consequence of change in autonomous investment or government expenditure will be felt on changing the level of national income. It is same thing as saying that Keynes assumes away the money market in his analysis in liquidity trap range.

Finally, we can refer to the intermediate range, which lies between Keynesian range and classical ranges. It is not shown but you can analyse the situation in Fig. 17.6 by taking the starting point (1) at which interest rate is 3% and national income is Rs.40 crore. Assume full employment national income is Rs.42 crore. It can be shown that this new full employment equilibrium of national income can be achieved either by shifting IS curve to the right keeping LM curve unchanged, or shifting LM curve to the right keeping IS curve unchanged or shifting both IS and LM to the right. Obviously shift in IS or LM curves to the right will be less if there is simultaneous shift of the both as compared to a situation where only one of them is to be shifted.

The relative effectiveness of monetary and fiscal policies to achieve full employment equilibrium level of income depends on the slopes of IS and LM curves. The general rule is that flatter the IS curve given the LM curve the more effective is the fiscal policy. Similarly steeper the IS curve, given the LM curve, monetary

policy is more effective. Moreover, flatter the LM curve with a given IS curve, monetary policy is more effective. You should take this as an exercise and show diagrammatically the four cases mentioned above concerning the relative effectiveness of monetary and fiscal policies in the intermediate range.

Check Your Progress 2

- 1) Explain the steps involved in the working of ‘crowding out’ effect.

- 2) Which policy, monetary or fiscal, will you recommend if LM curve becomes flatter given IS curve?

- 3) If tax is raised, argue how does it lead to less fall in National Income if Money Market is introduced along with Goods Market?

17.7 LET US SUM UP

In this unit we have given you an idea about goods market equilibrium by introducing its constituents. Investment-saving equality has been discussed to get the equilibrium in goods market. Various combinations of interest rate and national income are introduced to arrive at investment-saving equality. Similarly, money market equilibrium, its constituent’s equality between supply and demand for money at various combinations of interest rate and national income are discussed.

Integration of goods and money markets is discussed with the help of IS and LM curves to get a unique combination of interest rate and national income at which both goods market and money market are in equilibrium. How to achieve equilibrium in both the markets if they are in disequilibrium has also been discussed.

Finally, using IS-LM technique a detailed discussion has been attempted concerning classical, Keynesian and intermediate range. The policy implications of classical and Keynesian approaches have been spelt out at the end.

17.8 KEY WORDS

- ‘Crowding-out’ Effect** : It is a situation in which private investment is crowded or choked by public expenditure because of interest rate being influenced by changes in level of income.
- Double-Coincidence** : It is one of the problems faced in the operation of barter system of exchange. It refers to finding a person who has the good which you require and is also needing the good which you possess in surplus.

Financial Assets	: These are the assets consisting of shares, bonds, debentures, bills of exchange etc.
Inter-bank Deposits	: These are the deposits of one bank with other banks.
Indeterminate Exchange Rate	: It is an exchange rate which is not determined on scientific basis. This occurs in barter system of exchange.
LM Curve	: It is a locus of points at which at different combinations of income and interest rate demand for money or liquidity is equal to supply of money available.
Liquidity Trap	: It is that portion of LM curve where change in money supply has no influence on interest rate or it is a situation where the demand for money is infinity at a low interest rate.
Liquid Assets	: These are the assets, which can be converted into money without loss of much time and without undergoing monetary loss.
Money Market	: It is a market where demand and supply of money together determine interest rate.

17.9 SOME USEFUL BOOKS

Lipsey. Richard G. 1983, *An Introduction to Positive Economics*, (6th Edition), E.L.B.S. and Weidenfeld and Nicolson, London (Chapters 35-36).

Shapiro, Edward, 1984, *Macro Economic Analysis* (5th Edition), Galgotia Publications, New Delhi (Chapters 1 to 12).

Samuelson, Paul A. 1973, *Economics* (9th edition), International Student Edition, McGraw-Hill Kogakusho Ltd Tokyo (Chapters 11-12).

17.10 HINTS/ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) In region (d) we have deficit in money market and surplus in goods markets. Therefore, we will adopt contractionary monetary policy to raise the interest rate and contractionary fiscal policy lowering national income, or direction will be one facing upwards and other facing leftwards. As we keep adopting those policies we will cross to region (a) and from there we will adopt the route to reach point (3) as shown in Fig. 17.4
- 2) At a very low interest rate everybody expects future interest rate to rise. A consequence of this is the expectations of price of bonds to fall. Therefore, people would like to keep their wealth in the form of liquidity or money. Hence demand for money is infinite at a very low interest rate.
- 3) Contractionary monetary policy is a policy when money supply is reduced or

interest rate is raised. Since rise in interest rate lowers investment and hence national income, we call it a contractionary monetary policy.

Contractionary fiscal policy is an intervention when government expenditure is reduced keeping tax revenue unchanged or when tax revenue is raised keeping government expenditure unchanged. This leads to lowering of national income through expenditure and tax multipliers.

Check Your Progress 2

1) As public investment or government expenditure is increased national income rises due to multiplier effect. A rise in national income leads to rise in demand of money for transaction purposes and results in less supply of money available for speculative purposes. This raises interest rate which, in turn, leads to fall in private investment and therefore, the national income.

Hence, an initial increase in autonomous expenditure does not lead to as much increase in national income as it would have happened had there been no money market existing along with goods market.

2) Fiscal policy would be more suitable since we are approaching Keynesian range with LM curve becoming flatter.

3) Tax multiplier is given by $[-c]/[1-c]$, where c is marginal propensity to consume.

A rise in tax leads to fall in national income depending upon the tax multiplier $[-c]/[1-c]$. This leads to a fall in level of demand for money for transactions purposes. Consequently, supply of money available for speculation purposes rises which, in turn, leads to fall in interest rate and through that to a rise in national income.

Thus national income finally does not fall as much as it would have if money market did not exist along with goods market.