Demand Management Policies in Theory and Practice

5

Unit highlights:

⇒ **Effects of govt. purchases and tax reeducation**

⇒ **Goods market equilibrium**

⇒ **Money market equilibrium**

⇒ **Fiscal and monetory policy in AD-AS framework**

Lesson-1: Effects of Government Purchases and Tax Reductions on Equilibrium Output and Income.

Lesson Objectives:

After studying this lesson you will be able to

- w understand better the assumptions underlying the simple Keynesian multiplier model.
- w see why government intervention in needed to fight macroeconomic ills.
- w understand why the multiplier in presence of proportional taxes is smaller.
- w see that the size of the government expenditure multiplier is the same as any autonomous expenditure multiplier.
- w appreciate why choosing between final policy instruments is not quite straight forward.
- w understand what the paradox of thrift is and why it arises.

Effects of Government Purchases and Tax Reductions on Equilibrium Output and Income.

Assumptions underlying the simple Keynesian multiplier model.

In Lesson 3 of Unit 4, we presented a model of income determination of the simple Keynesian type. Its simplicity derives from the assumptions made. Some of the important ones are listed below:

1. The price level is fixed; this is not a very unrealistic assumption for an economy with massive unemployment.
2. There is no government and no foreign sector. These are only simplifying assumptions made to highlight some key relationships in income determination.
3. Investment is fixed. This is also a simplifying assumption, because it abstracts from the influence of interest rate and income on investment.
4. Only the goods market has been considered. A more realistic model must include asset and labour markets.

In this unit we shall relax some of these assumptions. As a first step, we introduce the government sector so that we can analyze when and how the government conducts its fiscal policy to cope with macroeconomic ills afflicting the economy.

The Government Sector

Government can influence output and income through its fiscal policy.

During a recession, people suffer from unemployment and joblessness. No wonder then that they want the government to do something about it. But what can the government do? The government can directly influence the level of equilibrium income in two different ways. First, we know that government spending is a component of aggregate demand. Therefore, during a recession the government can increase aggregate demand (and income) through its purchase of goods and services. Secondly, it can reduce taxes or increase transfer payments. These measures raise the disposable income of people and thereby tend to increase their consumption. Since consumption is a component of aggregate demand, tax reductions or increase in transfer payments tend to raise aggregate demand and hence income (via the multiplier). When the economy is booming and inflation is high, the government can rein in inflation by reversing the steps noted above (i.e. by increasing taxes and reducing government expenditures). These steps come under what is know as fiscal policy of the government. In short, government policy with respect to spending, level of transfers, and the tax structure is called fiscal policy.

Government policy with respect to spending, taxes and transfers is known as fiscal policy.

Government Sector and Aggregate Demand

Consumption depends on disposable income which in turn depends on taxes and transfers

With the introduction of the government sector, the aggregate demand should now be written as

$$AD = C + I_o + G \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Note that consumption will now depend not on income, but on disposable income (Y_d), which is the net income available to households after paying personal income taxes. Therefore, the consumption function (assumed linear as before) should be modified (ignoring transfer) as

$$C = C_o + \hat{c}\ Yd$$

or, $$C = C_o + \hat{c}\ (Y\text{-}T) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where T = taxes. We shall make two simplifying assumptions : a) government expenditure is a fixed amount, G_o; b) government collects a fraction, t, of income as taxes. In other words,

$$G = G_o \quad \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

and $T = tY$ … … … … … … (4)

Substituting (4) into (2), the consumption function can be written as

$$C = C_o + \hat{c} \ (Y-tY)$$

or, $C = C_o + \hat{c} \ (1-t)Y$ … … … … … … (5)

Marginal propensity to consume out of income is smaller than that out of desposable income.

The first thing to note about the reconstituted consumption function (5) is that income taxes lower consumption at each level of income because at each level of income disposable income is lower by the amount of taxes. Moreover, since tax is a fixed proportion of income, the marginal propensity to consume (MPC) out of income is $\hat{c}$ (1-t), though the MPC out of disposable income ($\hat{c}$). For example, if the MPC out of disposable income ($\hat{c}$) is 0.8 and t= 25%, then the MPC out of income is 0.60 (=0.8 * 0.75). Therefore combining (1), (3) and (5), we can express the aggregate demand function as

$$AD = C_o + \hat{c} \ (1-t)Y + I_o + G_o$$

or, $AD = (C_o+I_o+G_o) + \hat{c} \ (1-t)Y$

or, $AD = \bar{A} + \hat{c} \ (1-t) Y$ ---------- (6)

where now $\bar{A} = (C_o + I_o + G_o)$ = autonomous expenditure.

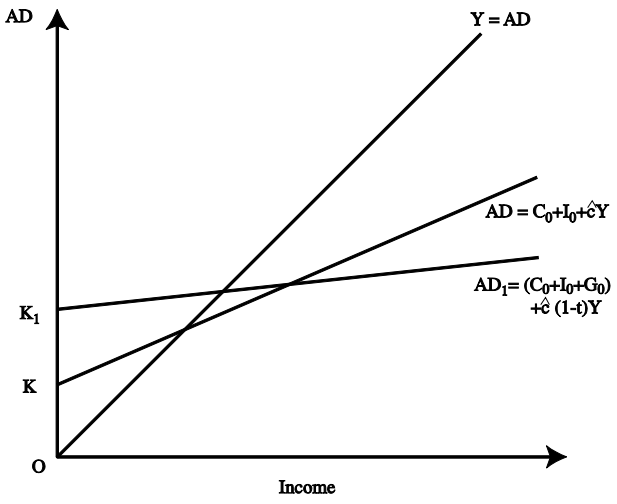

Fig. 5.1: Government and Aggregate demand

With the introduction of the government sector, the AD function in (6) becomes different from the earlier one which was

$$AD = Co + Io + \hat{c}Y \ \text{… … … … … … (6')}$$

Proportional taxes reduce the slope of the aggregate demand function.

Aggregate demand function (6) differs from (6') in two respects. First, the intercept (i.e. the level) of the AD function (shown as AD_1 in Fig 5-1) is higher, because of the inclusion of Go (K_1>K). Secondly, the slope of the aggregate demand function AD_1 is now smaller, because the MPC out of income, (1-t) $\hat{c}$ is lower than MPC out of disposable income, $\hat{c}$.

Determination of Equilibrium Income

We can now find the level of equilibrium income from the equilibrium condition

$$Y = AD$$

Using (6), we have

$$Y = \bar{A} + \hat{c}\,(1\text{-}t)Y$$

$$\text{or,} \quad Y\,[1-\hat{c}\,(1\text{-}t)] = \bar{A}$$

$$\text{or,} \quad Y = \frac{\bar{A}}{1-\hat{c}(1-t)} = \frac{C_o+I_o+G_o}{1\text{-}C^*} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

where $C^* = \hat{c}(1\text{-}t)$ = marginal propensity to consume out of income. Before the introduction of government, we had an equilibrium income

Fiscal policy can significantly affect the income level.

$$Y = \frac{C_0 + I_0}{1-\hat{c}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (7')$$

Comparing (7') with (7) we can see that government can significantly influence the level of equilibrium income.

Investment Multiplier Again

When there is a government which raises revenue by proportional taxes (as we have been discussing), the value of the multiplier will be lower than what it would be in the absence of proportional income taxes. We can use (7) to verify this. We can write

$$\Delta Y = \frac{1}{1-c^*}\,\Delta I \qquad (\because \Delta C_o = \Delta G = 0)$$

$$\text{or,} \quad \frac{\Delta Y}{\Delta I} = \frac{1}{1-c^*} = \frac{1}{1-\hat{c}(1-t)} \quad \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Taxes reduce the size of the simple multiplier

which is smaller than $\frac{1}{1-\hat{c}}$ as explained before. For example, if $\hat{C}$=0.8 and t=0, the multiplier is 5; but with the same marginal propensity and t= 25%, the multiplier is reduced to 2.5 $\left(=\frac{1}{1\text{-}0.8(1\text{-}.25)}\right)$. Why does this happen? Recall that

the multiplier process works through induced consumption. In the case of taxes, the induced consumption at each round is smaller. This makes ΔY (and hence the multiplier) smaller.

Change in Government Expenditures and Equilibrium Income

We can now consider the effects of a change in fiscal policy on the equilibrium level of income. The effects of two types of changes will be analyzed: a) an increase in government purchases and b) a reduction in tax rate. Fig. 5-2 shows the effect of an increase in G from G_o to G_1. Graphically, the effect of an increase in G_0 is similar to that of an equal increase in either I_o or C_o, all being components of autonomous expenditures, $\bar{A}$, In particular, an increase in government expenditure by ΔG pushes up the initial aggregate demand curve (AD_0) vertically by a distance ΔG. The new aggregate demand curve is AD_1. The equilibrium income rises from Y_0 to Y1. We can calculate the extent of increase in income (ΔY) using (7) according to which the equilibrium income is

The size of the government expenditure multiplier is the same as any antonomous expenditure multiplier.

$$Y = \frac{\bar{A}}{1-\hat{c}(1-t)}$$

$$\therefore \quad \Delta Y = \frac{1}{1-\hat{c}(1-t)}\,\Delta\bar{A} \quad \text{(e.g. if } Y = 2x,\ \Delta Y = 2\Delta x)$$

$$\text{or,} \quad \Delta Y = \frac{1}{1-\hat{c}(1-t)}\,\Delta\,(I_0+C_0+G_0)$$

$$\text{or,} \quad \Delta Y = \frac{1}{1-(1-t)}\,\Delta G$$

$$\text{or,} \quad \frac{\Delta Y}{\Delta G} = \frac{1}{1-\hat{c}(1-t)} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (9)$$

Eq. (9) gives the size of the government expenditure multiplier. This is, as we expect, equal to the investment multiplier (8) with proportional income taxes.

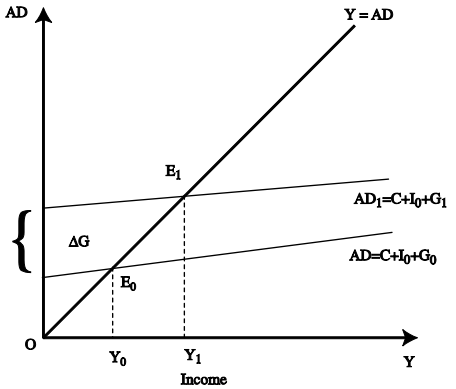

Fig. 5-2: Effect of Increased Government Purchases

Effect of Tax Rate Changes

Tax reduction can raise the level of income

Suppose that the government decides to reduce the tax rate (rather than raise G) to stimulate income and output. The aggregate demand curve for higher tax rate, t_o is AD_o in Figure 5-3. A lower tax rate t_1 will reduce

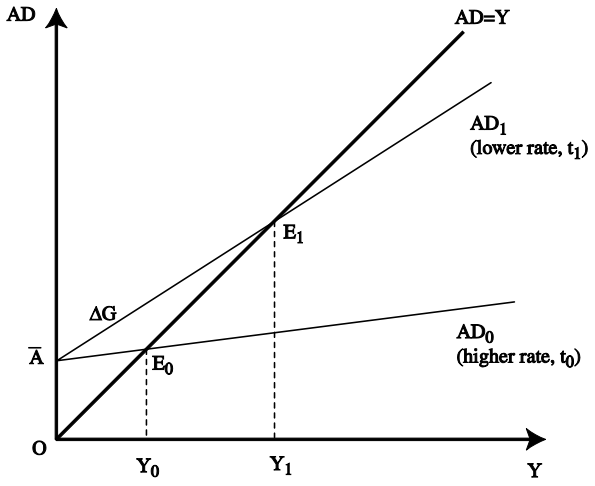

Fig. 5-3: Effect of lower Tax Rate

the slope of the new aggregate demand function (AD_1), keeping the intercept unchanged at $\overline{A}$. Lower tax rate increases the equilibrium income from Y_o to Y_1. Note that the effect of proportional tax on income is similar to that of a reduction in MPC.

Conclusion

Choosing between fiscal instruments is not a straightforward one.

From our discussion above, we see that the fiscal policy can be applied by the government to stabilize the economy. To fight unemployment, for example, the government can raise government purchases or reduce taxes. Views differ as to which one is a better policy instrument. Raising G has to be legislated in many countries, and takes time; however, it affects the aggregate demand directly. The tax policy affects aggregate demand only indirectly via increase in disposable income. Moreover, if the tax cut is regarded by people as temporary, its effect may not at all be significant.

The Paradox of Thrift

Let us examine what happens in the simple Keynesian model of income determination, when there is an upward shift of the saving function caused by a desire to save more at each level of income. Assume for the moment that investment is independent of the level of income. Then, as Fig. 5-4 shows, an upward shift of the saving function

Attempts to raise income by saving more collectively may lead to a curious result: both income and saving fall. The is the paradox of thrift.

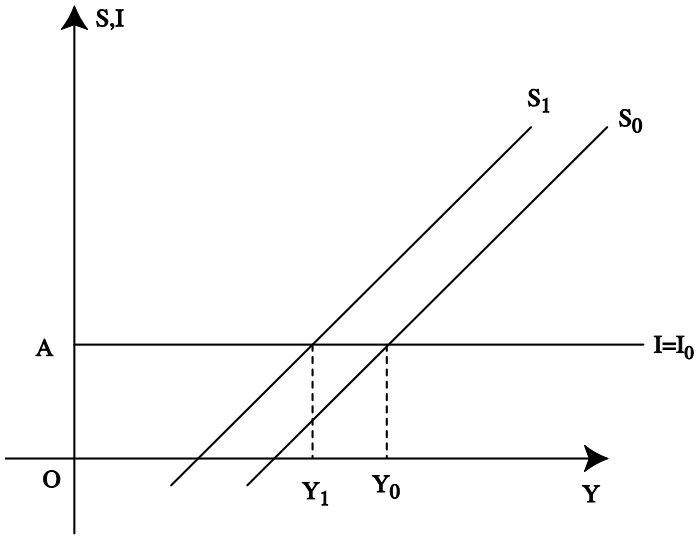

Fig. 5-4: An increased desire to save

causes the equilibrium income to fall, thus frustrating the desire to save move. The shift results in an excess of saving over investment, and income has to fall from Y_0 to Y_1, so that saving falls to the level of I_0. Here the desire to save more ends up in saving the same amount as before.

But this is not the worst of it. More realistically, the demand for investment should depend positively on the level of income, because more output requires more machines and factories. What happens to saving in this setting is illustrated in Figure 5.5. The initial equilibrium is Y_0, given by the intersection of I and S_o curves. When S_o shifts to S_1, the equilibrium income level falls to Y_1. As income falls, investment falls (fewer machines are now needed); saving too must fall to maintain equilibrium.

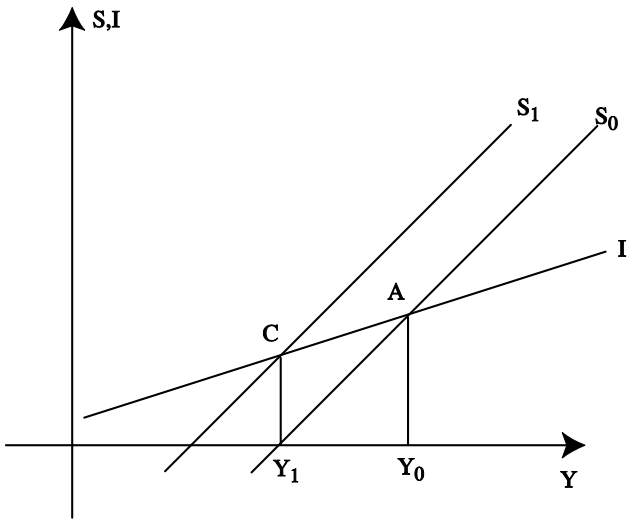

Fig. 5.5: The paradox of thrift

This is the paradox of thrift: Prosperity is promoted by expenditures, not by savings, as Keynes argues. (Try to save more to increase output, you end up saving less with lower income).

It can, however, be shown that the paradox holds only when there is large unemployment and actual output is way below the potential level. In a world of inflationary excess demand, the paradox disappears, and increased desire to save curbs inflation.

Review Questions

MCQ's (Tick the Correct Answer)

1. In the simple Keynesian multiplier model,
   a. the price level is assumed fixed
   b. the price level is assumed to be increasing
   c. the price level is assumed to be falling
   d. none of the above is applicable.
2. Through its fiscal policy, the government
   a. cannot influence income
   b. cannot influence unemployment
   c. can influence both income and unemployment
   d. can influence the money supply.
3. With proportional taxes, the marginal propensity to consume (MPC) out of disposable income is-
   a. smaller than MPC out of income
   b. larger than MPC out of income
   c. equal to MPC out of income
   d. none of the above.
4. The size of the government expenditure (G) multiplier should be equal to that of autonomous investment (I) multiplier, only if
   a. $\Delta I = \Delta G$
   b. $\Delta I > \Delta G$
   c. $\Delta I < \Delta G$
   d. money supply is equal to taxes.

Short Questions:

1. Mention of some of the assumptions underlying the Keynesian multiplier model. Why are these assumptions made?
2. How can a government fight unemployment and inflation through its fiscal policy? Explain.
3. Explain why the value of the multiplier is smaller in the presence of proportional taxes.
4. Explain how the paradox of thrift arises and when it is valid.

Broad Questions:

1. Explain diagrammatically how an increase in government purchases can raise income and output.
2. "What an increase in government expenditure can do in the fight against inflation can be done equally well by tax reductions." Do you agree? Give reasons for your answer.

Answers of MCQ's

1.a 2. c 3. b 4. a

Lesson-2: Goods Market Equilibrium when Investment is not fully Autonomous.

Lesson Objectives:

After studying this lesson, you will be able to-

- w understand why there is no unique level income at which the goods market clears, when investment depends on the rate of interest.
- w see why the assumption of linearity of behavioral functions is not necessarily misleading.
- w derive the IS curve graphically and algebraically
- w understand what determines the slope and position of the IS curve and to guess why such an understanding is important for analyzing the effects of fiscal (and monetary) policy.

Goods Market Equilibrium when Investment is not fully Autonomous.

The discussion of fiscal policy in Lesson 1 of this Unit was based on the assumption of fully autonomous investment. That is, investment is a fixed amount whatever the level of income. In this scenario, any given increase in government expenditure (G) leads to an expansion in equilibrium income which is several times the increase in government expenditure. The extent of income expansion is determined by the size of the multiplier which in turn depends on the marginal propensity to consume.

When investment depends on the rate of interest, there is no unique level of income at which the goods market clears.

In this Lesson, we bring our model a step closer to reality by adding a component of investment which is dependent on the rate of interest, while retaining the assumptions of a fixed price level and a closed economy (so that NX=0). Moreover, as before, we continue our attention to the goods market only. It turns out that when investment depends on the rate of interest, we cannot say what the aggregate demand (AD) will be, unless we know what the rate of interest is. This inability has a disturbing implication for the determinacy of the equilibrium income level. We do not know what the equilibrium level of income is until we know what the rate of interest is. In principle, there are an infinite number equilibrium income levels each being associated with a given rate of interest.

Investment as a Function of the Interest Rate

For simplicity we write the investment function as

$$I = I_o - b_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Io = autonomous investment which is independent of both income (Y) and the interest rate (i), and b=a positive constant showing how responsive investment (I) is to changes in the rate of interest.

Note several points about the investment function (1). First, investment is a linear function of the rate of interest, the graphical counterpart of which is shown is Fig. 5.4.

To assume a linear investment function is not misleading, but it greatly simplifies analysis.

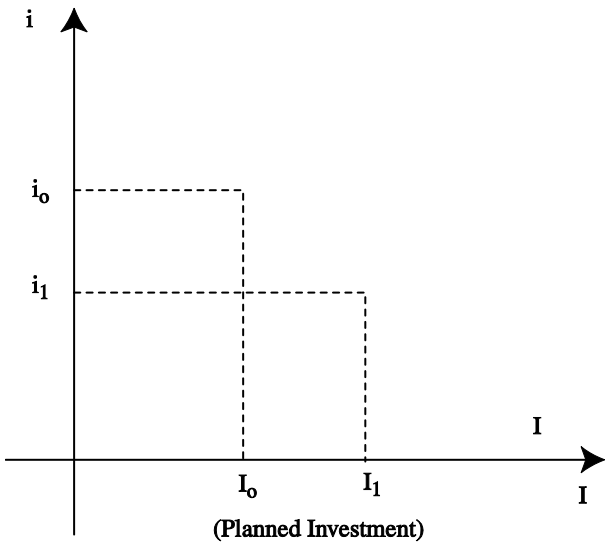

Fig. 5.6: The Investment Function

The linearity assumption simplifies both algebra and diagram without being misleading if we consider small changes in the economy.

Second, total investment has two components: one which is autonomous (I_0) and the other which is induced by changes in interest rate (b_i).

The investment schedule shifts rightward when antonomous investment rises

Finally, total investment falls as interest rate rises and rises when the interest rate falls. The strength of investment's response is indicated by the slope of the investment function (b). For instance, if 'b' is large, then a small change in the interest rate will cause a large drop in investment. This reflects the assumption that firms would like to add to their capital stocks (i.e. invest) lured by increased profitability brought about by lower interest rates. Conversely, if investment responds very little to changes in interest rates, the I-curve in Fig. 5.6 will be nearly vertical (very steep). The position of the investment curve depends on

both the slope (b) and autonomous investment (I_0). For example, an increase in I_0 will cause the whole I-curve to shift to the right.

Goods Market Equilibrium: The IS Curve

We know that for goods market equilibrium,

$$Y = C + I + G + NX$$

Under the assumptions made here NX = 0, Therefore,

$$Y = C+I+G \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

But $C = Co + \hat{c}\ (1-t)Y$ (Eq (5) in lesson 1)

$I = I_0 - b_i$ (Eq. (1) of this Lesson)

$G = G_0$ (Eq (3) of Lesson 1)

Substituting these into the RHS of (2), we have

$$AD = Co + \hat{c}\ (1-t)Y + I_0 - b_i + G_0$$

or, $$AD = (C_0 + I_0 + G_0) + \hat{c}\ (1-t)\ Y - b_i$$

or, $$AD = \overline{A} + \hat{c}\ (1-t)Y - b_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where $\overline{A}$ = autonomous expenditures = $(C_0 + I_0 + G_0)$

Recall from Lesson 1 that when investment is totally autonomous, we have

$$AD = \overline{A} + \hat{c}\ (1-t)Y \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Comparing (3) with (4) we see that when investment is a function of the rate of interest, the aggregate demand depends not only on the level of income, but also on the rate of interest. For any given level of income, the higher the rate of interest, the lower is the aggregate demand and vice versa. For any given rate of interest, there is a given level of aggregate demand, and hence a given level of equilibrium income (since Y=AD).

Now aggregate demand depends on the level of income as well as the interest rate.

We can now use this characteristic embodied in (3) to derive the IS curve which shows various combinations of income and the rate of interest for each of which the goods market is in equilibrium (AD=Y). In Fig. 5.7 (a) the aggregate demand curve AD_0 refers to a rate of interest i_o, and the corresponding equilibrium level of income is Yo. Now suppose that the rate of interest falls to i_1. As a result, the level of investment goes up from I_o to I_1 (see Fig 5.6). This will cause a parallel shift of the AD function from AD_o to AD_1, raising the equilibrium level of income from Y_o to Y_1. Thus, a lower interest rate is associated with a higher equilibrium income and vice versa. This has been shown in Fig 5.7 (b).

How to derive the IS curve. graphically

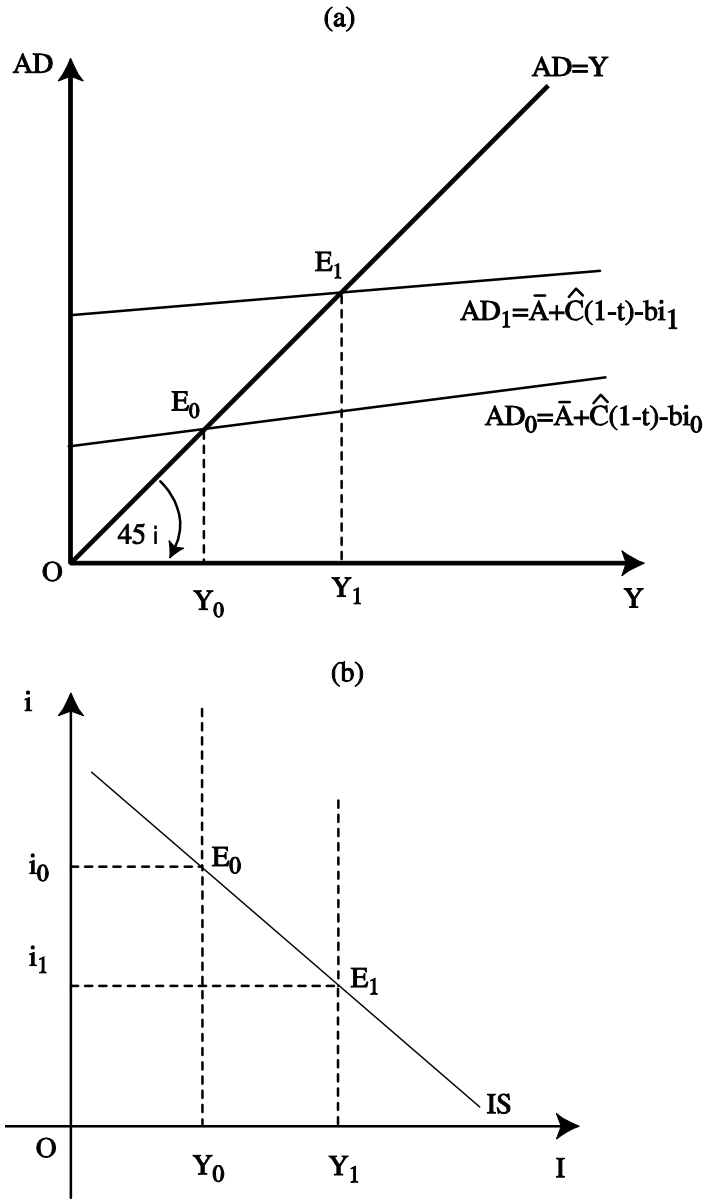

Fig. 5.7: Derivation of the IS curve

The point E_o corresponds to (i_o, Y_o) and E_1 to (i_1,Y_1). By varying the interest rates and noting the corresponding income levels, we can trace a negatively sloped curve, IS, in Fig 5.7 (b). This curve is called the IS curve to underline the fact that the pair of interest rate and income level shown by any point on this curve represents goods market equilibrium (AD=Y or Investment (I) = Saving (S), comprehensively defined).

To derive the equation of the IS curve, let us write

$$Y = AD$$

or, $Y = \bar{A} + \hat{c}(1-t)Y - bi$ ... ... (from (3))

or, $Y\,[1-\hat{c}(1-t)] = \bar{A} - bi$

or, $Y = \dfrac{1}{1-\hat{c}(1-t)}(\bar{A} - bi)$

or, $Y = \alpha(\bar{A} - bi)$ ... ... (5)

where $\alpha = \dfrac{1}{1-\hat{c}(1-t)} = \text{Multiplier}$

Equation of the IS curve derived algebraically

This is the equation of the IS curve showing that income and the rate of interest must move in opposite directions in order to maintain the equality of aggregate demand and output produced.

Slope of the IS curve

The slope of the IS curve is smaller, the larger the interest responsiveness of investment and the size of the multiplier.

We can rewrite (5) as

$$i = \frac{\bar{A}}{b} - \frac{Y}{b\alpha} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5')$$

The (absolute) slope of the IS curve is given by $\dfrac{1}{b\alpha}$. The IS curve is negatively sloped as we can see from (5'). This is so because an increase in the interest rate lowers planned investment and this reduces aggregate demand (and hence income).

What determines the slope of the IS curve? From eq (5') we can see that the larger the value of the multiplier $\left\{\alpha = \dfrac{1}{1-\hat{c}(1-t)}\right\}$ and the larger the responsiveness of investment to changes in the rate of interest (i.e. 'b'), the lower is the slope (the flatter is the IS curve). If investment is very sensitive (large b), then a given change in the rate of interest produces a large change in aggregate demand, shifting the AD in Fig. 5.7 (a) by a larger amount than otherwise. As a result, income too will rise by a large amount. Since a given change in the interest rate produces a large increase in income, the IS curve must be very flat. Conversely, if b is small (investment less sensitive to i), then the IS curve is relatively steep.

The multiplier too affects the steepness of the IS curve. The larger the multiplier (i.e. the larger the marginal propensity to consume), the flatter the IS curve. In this case, a given fall in the interest rate will lead to a large increase in income, and therefore the IS curve will be flat. The multiplier also depends on the tax rate (t); therefore the fiscal policy can affect the slope of the IS curve. For example, an increase in the tax rate lowers the multiplier, making IS curve steeper.

Shifts of IS Curves

The IS curve shifts primarily because of changes in antonymous expenditures on goods

From eq. (5') we see that the intercept of the IS curve is given by $\frac{\bar{A}}{b}$, implying that the curve will shift when there is a change in autonomous spending. For instance, an increase in government expenditure by increasing $\bar{A}$ will shift the IS curve to the right. This means that for any given rate of interest the income required for goods market equilibrium must be higher.

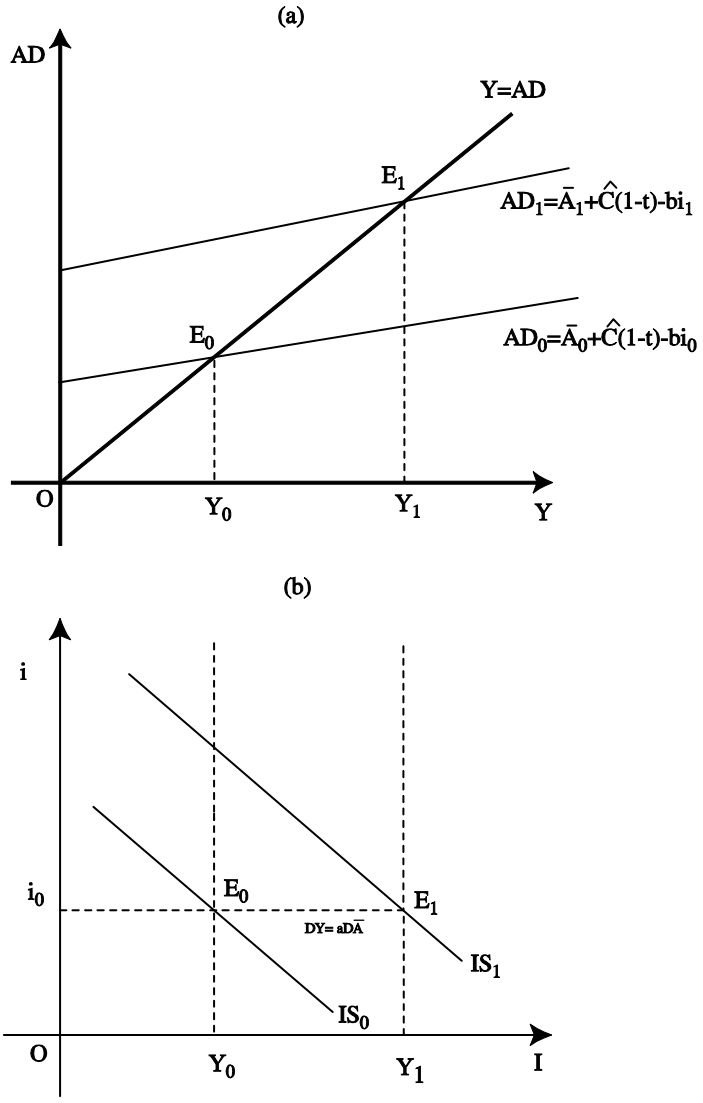

Fig. 5.8: Shifts in the IS Curve

In Fig. 5.8 (a) the level of income associated with $\acute{Y}_0$ is Y_0, when autonomous expenditure is $\bar{A}_o$. This combination of interest rate and income (i_o, Y_o) is shown as point E_o on IS_o in Fig 5.8 (b). Now let $\bar{A}$ increase from $\bar{A}_o$ to $\bar{A}_1$, resulting in

an upward shift of AD_o to AD_1. At the unchanged interest rate (i_0), the equilibrium income is now higher (Y_1). In Fig. 5.8 (b) this is shown as point E_1. Since we have chosen i_o arbitrarily, we can assert that as a result of an increase in $\bar{A}$, each point on IS_o will move horizontally rightward, tracing the new IS curve, IS_1.This shows that a change in $\bar{A}$ (autonomous expenditures) will shift the IS curve to the right (increase in $\bar{A}$) or to the left (decrease in $\bar{A}$)

What will be the extent of shifts? Obviously this will be equal to the multiplier times the change is $\bar{A}$ (i.e. $\Delta Y = \alpha \Delta \bar{A}$). We can see this algebraically by using the equation of the IS curve given in eq. (5').

$$i = \frac{\bar{A}}{b} - \frac{Y}{\alpha b} \quad \text{---------- (5')}$$

or, $$\Delta i = \frac{1}{b}\left(\Delta \bar{A} - \frac{1}{\alpha}\Delta Y\right)$$

or, $$O = \frac{1}{b}\left(\Delta \bar{A} - \frac{\Delta Y}{\alpha}\right) \qquad (\text{since } \Delta i = 0)$$

or, $$\frac{\Delta Y}{\alpha} = \Delta \bar{A} \qquad (\text{Since b is a constant})$$

or, $$\Delta Y = \alpha \Delta \bar{A}$$

You may wonder why we have spent so much efforts to understand the determinants of the slope of the IS curve and its position. There are good reasons for this. We have already seen that the fiscal policy can change the slope of the IS curve (by changing the tax rate) as well as its position (by changing the government expenditure). Later when we discuss the effects of fiscal policy (and monetary policy) the determinants of slopes and positions of the IS curve will turn out be quite important. Finally, note that points to the right of the IS curve represent dis-equilibrium in the goods market because there is excess supply. Likewise points to the left of the IS curve also represent disequilibrium because there is now excess demand. Only the points on the IS curve represent equilibrium because there is neither excess demand nor excess supply in the goods market.

Understanding the determinants of slope and position of the IS curve in important for analyzing the effects of fiscal and monetary polices.

Review Questions

MCQ's (Tick the correct or most appropriate answer)

1. The IS curve is the schedule of combinations of interest rates and the levels of income such that the market that is equilibrium is
   a. the labour market
   b. the asset market
   c. the money market
   d. the goods market.

2. When planned investment is an inverse function of the rate of interest, the equilibrium income in the goods market is usually
   a. inversely related to the rate of interest
   b. positively related to the rate of interest
   c. unrelated to the rate of interest
   d. a fixed number.

3. When investment does not respond at all to changes in the rate of interest, the IS curve will be
   a. horizontal
   b. vertical
   c. negatively sloped
   d. none of the above.

4. Assume that the government expenditure goes up by $100 and that the value of the multiplier (α) is 5. This will shift the IS curve
   a. to the left by $500
   b. to the right by $400
   c. to the right by $500
   d. to the right by $100.

5. To the right of a given IS curve are combinations of income levels and interest rates such that
   a. there is excess demand in the goods market
   b. there is excess supply in the goods market
   c. the goods market is in equilibrium
   d. there is excess supply in the money market.

6. To the left of a given IS curve are combinations of interest rates and income levels such that
   a. there is excess demand in the goods market
   b. there is excess supply in equilibrium
   c. the goods market is in the goods market
   d. there is excess supply in the money market.

Short Questions

1. "Although both the interest sensitivity of investment spending (b) and the MPC (via the multiplier, α) determine the slope of the IS curve, a necessary condition for a negatively sloped IS curve is that the value of $b>0$." Explain.
2. When would you expect the IS curve to be vertical? Explain diagrammatically.
3. Given that $b>0$, the greater the value of the multiplier (α), the flatter the IS curve. Why?
4. Which way is the IS curve expected to shift if there is an increase in autonomous investment? Explain.

Broad Questions

1. What does the IS curve show? Why is it usually negatively sloped? Give reasons for your answer.
2. What are the determinants of the slope of the IS curve? What change would you expect in the slope of the IS curve, if investment becomes more responsive to the rate of interest?
3. Explain why the points off the IS curve represent disequilibrium in the goods market.

Answer of MCQ's

1. d 2. a 3. b 4. c 5. b 6. a

Lesson-3 : Money Market Equilibrium and the LM Curve

Lesson Objectives

After studying this lesson, you will be able to

- see why an understanding of the money market equilibrium is necessary for interest rate determination
- understand what the LM curve is and what it represents
- identify the determinants of the slope and the position of the LM curve
- explain why points off the LM represent disequilibrium in the money market

Market Equilibrium and the LM Curve

Studying the money market equilibrium is a step towards understanding how the rate of interest is determined

We have briefly talked about how the stock of money serves as the basis of aggregate demand in our discussion of the classical macroeconomic model. However, in the extended Keynesian models that followed, we have been deliberately silent about the role of money in influencing the level of aggregate demand and hence the level of income. In the previous lesson we have found that the rote of interest is an important influence on aggregate demand through its effect on planned investment. We do not yet know how the rate of interest is determined. For this explanation we must turn our attention to the money market and money market equilibrium. However, by doing this we will proceed only a step forward towards our goal. For we will see that the money market equilibrium represented by the LM curve does not give us a unique (determinate) rate of interest; each interest rate is associated with a given level of real income. To anticipate what is to come at a later lesson, we will be able to determine the rate of interest and the level of income uniquely by considering simultaneous equilibrium in the goods and money markets.

The Asset Market

In the asset market, money, bonds, stocks and other assets are bought and sold

Money is a financial asset. As such the money market is a part of the overall assets market in which money, bonds, stocks and other real assets are traded. However, it is convenient analytically to devide assets into two groups-money and other assets. The other assets are marketable claims to future income for which we shall use the catch-all term bonds.

The holder of a bond is entitled to receive a certain agreed sum of money at a stipulated rate in the future from whoever issues the bond, while wealth held in money yields no income.

Portfolio Decisions

Because of the wealth budget constraint, money market equilibrium implies bond market equilibrium and vice versa.

An individual has to decide how much of his or her financial wealth at a given time is to be held in bonds or in money. The distribution of a given amount of wealth between money and bonds is in fact, the result of one and the same decision. For example, if you have $1000 in financial wealth and decide to hold $800 in bond, you in fact have decided to hold $200 in money. Likewise your decision to hold $200 in money is equivalent to a decision to hold $800 in bonds. Decisions with respect to the distribution of financial wealth between money and bonds are known as portfolio decisions. The fact that the value of bonds and money must add up to the total financial wealth is known as the wealth budget constraint faced by the wealth holder. And because of this constraint we can assert that when the money market is in equilibrium, so is the bond market. This greatly simplifies analysis, because we can talk of equilibrium in the asset market by concentrating only on equilibrium in the money market (or the bond market). Here we adopt the money market equilibrium approach.

The Money Market : Demand and Supply

In Unit 9, the issues concerning the demand for and the supply of money will be discussed in detail. For our purposes here only a brief review of their determinants will suffice.

Demand for money is demand for real balances

The supply of money is determined by the central bank (the monetary authority) of the country concerned. The considerations which are taken into account in setting the quantity of money by the central bank need not detain us here. We will simply assume that the supply of money is given at the level $\overline{M}$. Since we assume, as before, a given price level, $\overline{P}$, the real money supply becomes $\frac{\overline{M}}{\overline{P}}$.

On the demand side, the first thing to note is that the demand for money is demand for real balances. People hold money to make purchases. For any given volume of purchases the nominal amount of money required to be held varies with the price level. For example, to purchase two computer desks at $100 a

piece, you need to hold $200; but if the price goes up to $200, you must hold $400 to make the same purchases. In each case, your demand for real balances (M/P) is the same, but the nominal demand is not.

Real demand for money depends positively on the level of real income and inversely on the rate of interest

Secondly, the demand for money depends on the level of real income and the interest rate. The higher the real income, the higher is the demand for real balances. The volume of purchases goes up with the level of real income, and so must the demand for real balances. The relationship between the demand for real balances and the rate of interest is slightly more tricky. We know that money held in cash yields no income. Therefore, holding money has an opportunity cost in terms of income forgone. Suppose that for $100 we can buy a bond and earn an income of $5 per annum. But if you keep $100 in cash you sacrifice the opportunity of earning $5 for the convenience of holding cash. The higher the interest rate, the higher is the cost, and hence the lower your demand for cash, because you will try harder than before to economize on your cash holding. This makes the demand for real balances an inverse function of the rate of interest.

Now if the demand for real balances increase with the level of real income and decrease with the rate of interest, we can write the demand function for money as

$$L = kY - hi \qquad (k,h > 0) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where k and h are parameters showing the sensitivity of the demand for real balances and interest rate respectively. For instance, if h=2 and the interest rate rises by one percentage point the real demand for money will fall by 2 real dollars.

Determination of the Interest Rate for Given Real Income

Money market equilibrium is possible for can infinite number of combinations of real income and interest rates. The LM curve represents these combinations

In Fig.5.9 we have drawn demand curves for money as downward slopping lines, their absolute slope being 'h' in accordance with the demand function given in relation (1). The position of the curves is defined by the level of real income, given the value of 'h'. The higher the levels of real income, the further out the L-curves from the origin. We have drawn two demand curves in Fig.5.9 corresponding to two levels of real income, Y_o and Y_1, where $Y_1 > Y_o$. In the same figure, the supply of real balances has been shown as a vertical line, because of our assumption that the supply of money $\overline{M}$ is exogenously given by the

monetary authority and that the price level is fixed at $\bar{P}$. If the demand for money is given by L_o (Y_o), the

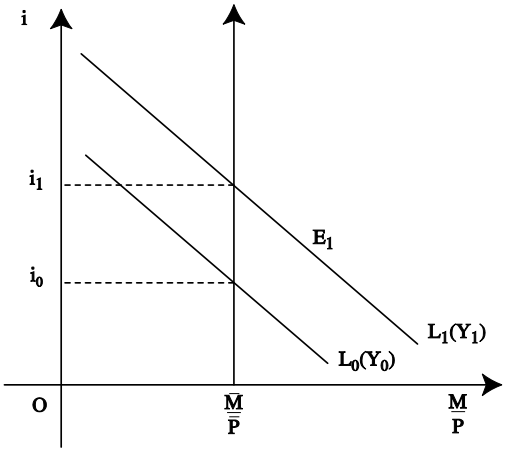

Fig. 5.9: Interest Rate Determination

money market clears (supply equals demand), if the rate of interest is i_o. In other words if the level of real income and the rate of interest are respectively Y_o and i_o, equilibrium prevails in the money market. However, this is not the only combination of interest rate and income which ensures money market equilibrium. To see why assume that the demand curve L_o (Y_o) shifts upwards to L_1 (Y_1) when the real income rises from Y_o to Y_1. The excess demand for money that results at the original interest rate (i_o) will push the interest rate up to i_1 so that the money market is again in equilibrium for $Y=Y_1$ and $i=i_1$.

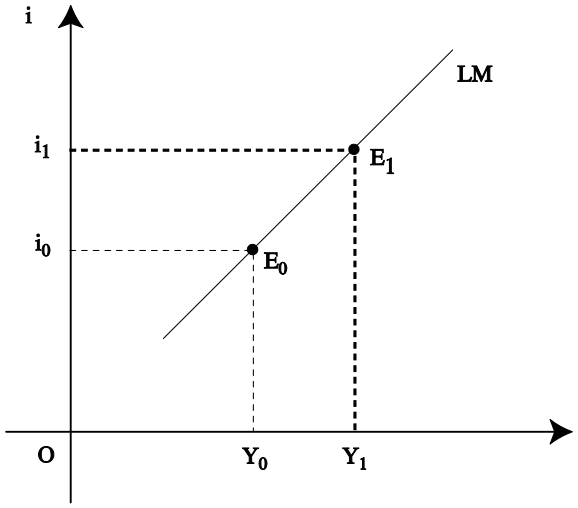

Fig. 5.10: The LM Curve

The slope of the LM curve is positive, because a higher interest rate must be associated with a higher income level

In Fig.5.10, these two combinations of i and Y have been plotted in the i-Y space as points E_o and E_1. From Fig.5.9 we can see that for money market equilibrium

higher real incomes requires (are associated with) higher interest rates. Repeating the procedure for all possible levels of income and recording the relevant (i,Y) pairs, we can trace out the curve labeled LM in Fig.5.10. The LM curve shows all combinations of the rate of interest and the level of income such that the money market is in equilibrium.

The LM curve is positively sloped. Starting with an equilibrium (a point on the LM curve) when the rate of interest goes up, the demand for real balances falls, and to compensate for this fall, the level of real income must rise sufficiently to restore equilibrium. Therefore, for money market to be in equilibrium, the higher the interest rate the higher must be the level of income. We can quite simply drive the equation of the LM curve algebraically. Money market equilibrium requires that

$$L = \frac{\overline{M}}{\overline{P}}$$

$$\text{or,} \quad kY - hi = \frac{\overline{M}}{\overline{P}} \qquad \text{(using (1))}$$

$$\text{or,} \quad i = \frac{k}{h} Y - \frac{1}{h} \frac{\overline{M}}{\overline{P}} \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

The relationship (2) represents the LM curve. We can easily recognize that the slope of the LM curve (i.e, $\frac{\Delta i}{\Delta Y}$) is $\frac{k}{h}$ which is positive, because k and h are both positive by specification.

We now turn to identify the determinants of the slope and the position of the LM curve, for the same reason as we did in the case of the IS curve.

The slope of the LM curve varies positively with the income sensitivity of demand for money and inversely with the interest sensitivity.

Slope and Position of the LM Curve

From eq. (2) we see that the slope of the LM curve is given by (k/h). Therefore, the lower the interest sensitivity of demand for real balances (h) and the higher the responsiveness of demand to income (k), the larger will be the slope (the steeper will be the LM curve). A low sensitivity of demand to the rate of interest implies that demand for money will fall by a small amount when the interest rate drops by a certain percentage point. Therefore, to restore equilibrium, income has to fall by only a small amount, making the LM curve steeper than otherwise (i.e, when h is large). On the other hand, when the income responsiveness of demand

for money is high a unit increase in income will cause a large shift in the demand for money and hence a large increase in the interest rate. This too makes the LM curve steep.

The causes of shifts of the LM curve is easier to identify. Along any given LM curve, the real supply of money is held constant. Therefore, if the supply of money goes up (exogenously) the LM curve will shift to the right. On the other hand, a reduction in nominal money supply (with price level unchanged) will shift the LM curve to the left. When the money supply goes up, at the original interest rate there will appear an excess supply of money. This can be eliminated (to restore equilibrium) at the unchanged interest rate if the level of income rises sufficiently (or, at the unchanged income level if the interest rate falls by enough). In either case, an increase in money supply (which implies an increase in real supply since the price level is fixed) will shift the LM curve to the right.

The LM curve shifts to the right when the real money supply goes up.

Finally, note that for all combinations of (i,Y) to the right of a given LM curve there is an excess demand for money, while for those to the left, there is excess supply. As an illustration compared point E_0 with point E_1

For points to the right of the LM curve there is excess demand for money, while those to the left represent excess supply

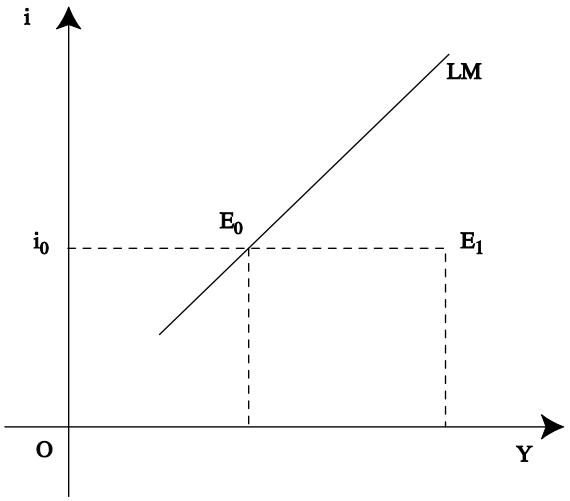

Fig. 5.11: Points off the LM Curve represent disequilibrium

in Fig.5.11. E_o represents money market equilibrium (being on the LM curve), while E_1 does not (being off the LM curve). The higher income at E_1 means that the demand for money is larger at E_1 than at E_o, because $i=i_o$ in both cases, since the real money supply is unchanged, there must be an excess demand for money at E_1.

Review Questions

(MCQ's) Tick the Correct Answer

1. The demand for money is
   a. positively related to the level of income and the rate of interest.
   b. negatively related to the level of income and the rate of interest.
   c. positively related to the rate of interest and negatively related to the level of income.
   d. positively related to the level of income and negatively related to the rate of interest.
2. Suppose that the price level is fixed and the nominal money supply increases. Therefore, the real supply of money will
   a. decrease
   b. increase
   c. remain unchanged
   d. be affected in none of the ways noted above.
3. When the rate of interest goes up, the cost of holding money
   a. goes up
   b. decreases
   c. remains the same
   d. may either increase or decrease.
4. If the demand for money does not depend at all on the rate of interest, the relationship between the demand for money and the level of income is (given the specification in the text):
   a. non-proportional
   b. proportional
   c. non-proportional under special circumstances
   d. none of the above.
5. Equilibrium in the money market described by the equation $i = \frac{k}{h} Y - \frac{1}{h} \frac{\overline{M}}{\overline{P}}$.
   The slope of the LM curve decreases (the LM curve becomes flatter) when
   a. both k and h increases in the same proportion
   b. both k and h decreases in the same proportion
   c. k decreases and h increases
   d. k increases and h decreases.

6. Suppose that the demand for money equals supply when Y=$100 and i=5%. When Y falls from $100 to $75 with i=5%, in the money market there will be
   a. an excess supply of money
   b. an excess demand for money
   c. neither excess demand nor excess supply of money
   d. an equality between the demand for and the supply of money.

Short Questions

1. Why is the demand for money a demand for real balances?
2. Explain why the demand for money varies inversely with the rate of interest.
3. Why is the LM curve positively sloped?
4. How is the interest sensitivity of the demand for money related to the slope of the LM curve?
5. What happens to the position of the LM curve when the supply of money goes up with the price level constant?

Broad Questions

1. What does the LM curve represent? Explain how this curve can he geometrically derived.
2. "At points to the right of the LM curve, there is an excess demand for money, and at points to the left, there is excess supply of money." Explain with reasons.
3. Under what circumstances might the LM curve be horizontal? Explain intuitively.

Answers (MCQ's)

1. d 2. b 3. a 4. b 5. c 6. a

Lesson-4: Fiscal and Monetary Policies in the AD-AS Framework

Lesson Objectives

After studying this lesson, you will be able to

- see how simultaneous equilibrium in goods and money markets is necessary to determine a unique level of income and the rate of interest.
- understand what the aggregate demand curve for the economy shows and how it is derived.
- have an educated guess about why the aggregate supply curve usually is positively sloped and why it becomes steeper as the actual output approaches the protential level.
- see how both the output and price levels are jointly determined in the AD-AS framework.
- understand how the tools of fiscal and monetary policies are employed to fight unemployment and inflation.

Fiscal and Monetary Policies in AD-AD Framework

Simultaneous equilibrium in goods and money markets yields a unique level of income and the corresponding rate of interest

In Lesson 2 and 3 of this Unit, we have described how the goods and money markets achieve equilibrium in isolation, assuming as in the simple Keynesian model, that the price level is fixed. The assumption of a fixed price level (which is later relaxed) implis that the level of output is demand driven. If we know what the aggregate demand is in equilibrium, we also know what the equilibrium output and income is, because the aggregate supply adjusts passively (and completely) to the level of aggregate demand. However, as we have seen, the introduction of the rate of interest as a determinant of aggregate demand makes equilibrium output determination a little more complicated. Considering the goods market equilibrium and money market equilibrium separately is inadequate for determinate outcomes. To determine the unique level of equilibrium income and the rate of interest, equilibrium in both the markets must be addressed simultaneously. To this we turn next. And having done that we intend to derive the aggregate demand curve for the economy.

Then leaving the details for discussion in unit 6, we will introduce the notion of aggregate supply curve (AS) and confront it with the aggregate demand curve (AD) just derived. This will release us from another restriction we imposed on

ourselves by assuming that the price level is fixed. The AD-AS framework, as mentioned earlier, allows us to explain changes in both the level of output and the price level. In this sense, the AD-AS framework is the culmination of our efforts so far; we have finally in our possession a complete analytical apparatus that can satisfactory handle two major macroeconomic concerns in the short run, namely, unemployment and price instability. Finally, using the AD-AS framework, we discuss briefly how the government grapples with the problems of unemployment and inflation with the help of fiscal and monetary policies (collectively known as demand management policies, because they work through changes initiated on the demand side of the economy).

General Equilibrium: Goods and Money Markets

Simultaneous equilibrium in the goods and money markets is achieved when the level of income and the rate of interest are such that both markets clear. In Fig.5.12 this condition is satisfied when $i=i_o$ and $Y=Y_o$, given the exogenous variables such as the real money supply and the fiscal policy (which define the position of the IS and LM curves). These values of i and Y correspond to the intersection of IS and LM curves at E_0. It is clear that given these curves, (i_o, Y_o) is the only pair at which both the goods market and the money market are in equilibrium. All other

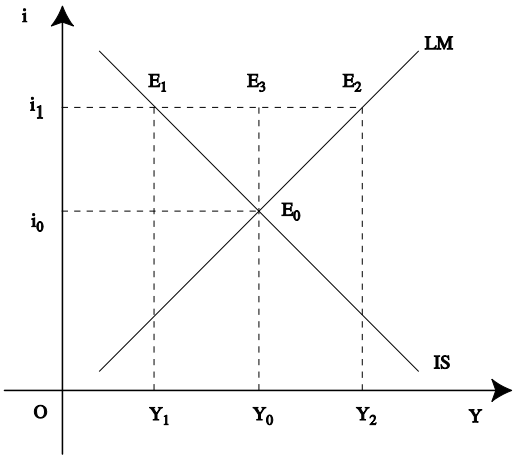

Fig. 5.12: Goods and Money Market Equilibrium

The equilibrium level of income and the rate of interest correspond to the intersection of IS and LM curves.

combinations will represent disequilibrium in either or both markets. For example, the combination represented by E_1 (i_1, Y_1) clears the goods market (it is on IS), but not the money market, where there is excess supply of money. On the other hand, at point E_2 (i_1, Y_2), we have money market equilibrium (it is on LM),

but disequilibrium in the goods market where there is an excess supply. We can also have disequilibrium in both markets. E_3 (i_1, Y_o) represents such a possibility; in this case, there is excess supply in the goods as well as the money market. Given the IS and LM curves, if $i \neq i_o$ and $Y \neq Y_o$, forces will be set up to move them towards (i_o, Y_o), though the path of adjustment towards equilibrium may be different depending on circumstances assumed.

The AD curve shows the combinations of output demanded at various price levels

The Aggregate Demand

As we have mentioned before, the AD curve shows the levels of output demanded at various prices such that for each price goods and asset markets are simultaneously in equilibrium. For example, suppose that the price level assumed constant while drawing the LM curve in Figure 5.12 is P_0. Then the equilibrium output Y_0 demanded (i.e. planned expenditure) at this price level (P_0) is consistent with simultaneous equilibrium is goods and money markets.

The Aggregate Demand Curve

Recall that the LM curve shifts when the real money supply ($\overline{M}/\overline{P}$) changes. The real money supply changes with changes in the nominal money supply (M) or in the price level (P). In Figure 5.13 (a), the money market equilibrium shown by LM_0 is drawn for $\overline{P}=P_o$, so that given the goods market equilibrium shown by the IS curve, the simultaneous equilibrium in goods and money market is given by the interest-income pair (i_0, Y_0). This equilibrium corresponds to the price-income combination (P_o,Y_o). In Figure 5.13(b), this pair is shown in P-Y space as point E_0. This is obviously a point on the aggregate demand curve.

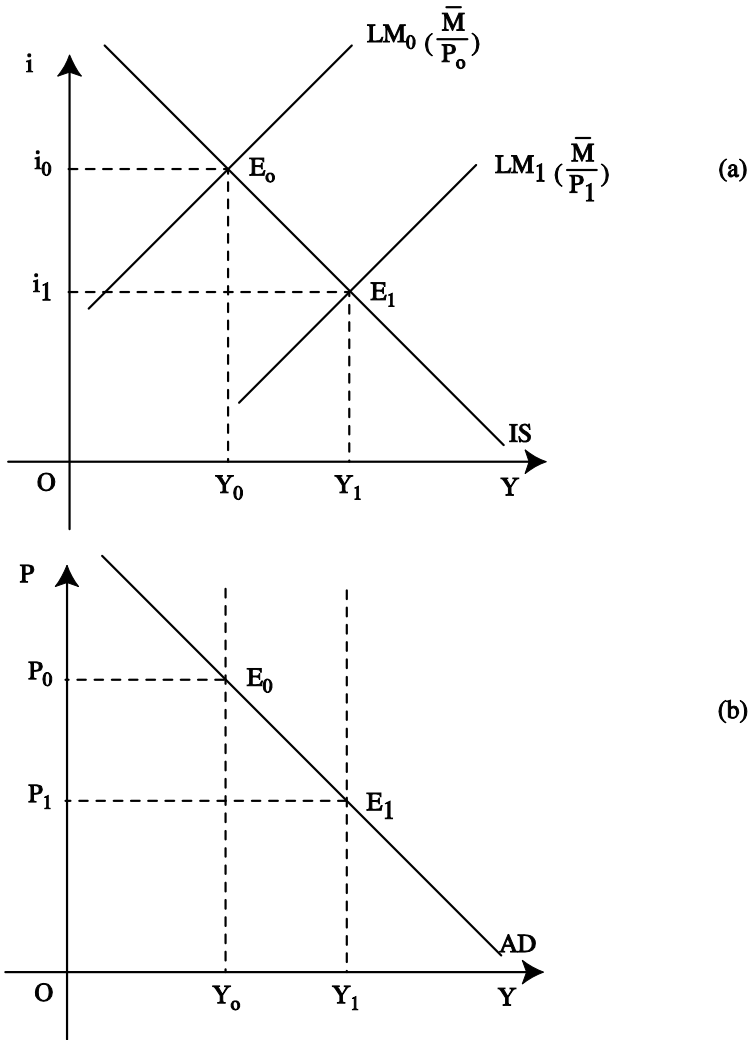

Figure.5.13: Derivation of the AD Curve

Now suppose that the price level falls from P_0 to P_1, while the money supply remains fixed at $\overline{M}$. The resulting increase in real money supply (now $\overline{M}/P_1$) shifts the LM curve in Fig. 5.13(a) to LM_1, yielding a new equilibrium income (= expenditure) of Y_1. Since Y_1 corresponds to P_1 ($<P_0$), we have another point on the AD curve, shown as point E_2 in Fig 5.13(b). By doing the same exercise of changing price and finding corresponding income (and expenditure) levels, we can trace out a downward sloping curve AD, as shown in Fig. 5.13(b). This is the aggregate demand curve we are seeking which shows the various combinations of price and income consistent with simultaneous equilibrium in money and goods markets.

The slope of the AD curve depends on those parameters which define the slopes of IS and LM curves

The AD curve is negatively sloped. Let us see why. When the price level falls (and hence the real money supply goes up), an excess supply of money develops

in the money market at the original interest rate. For the market to clear, the rate of interest has to fall. The lower interest rate then leads to higher investment and higher output via the multiplier.

The slope of the AD curve depends on those parameters which define the slope of IS and LM curve.

What factors determine the slope of the AD curve? Not surprisingly, these are none other than those determining the slopes of IS and LM curves, because AD is derived from these very curves. You can easily convince yourself that

1. The larger the interest responsiveness of the demand for money (h) and the smaller the interest sensitivity of investment demand (b), the steeper is the AD curve.
2. The smaller the multiplier (α) and the larger the income responsiveness of the demand for money (k) the steeper the AD curve.

Expansionary fiscal or monetary policy can shift the AD curve rightward

It can be easily established that an expansionary fiscal policy by shifting the IS curve to the right can shift the AD curve in the same direction, because given the LM curve (and hence the price level), the equilibrium output demanded will be higher at that price level. An expansionary monetary policy (i.e. increasing the supply of money) can lead to the same effect. When the money supply goes up with the price level remaining unchanged, the real money stock goes up. As a result, the equilibrium output demanded goes up at the given price level. This of course means that the whole AD curve shifts rightward.

The Aggregate Supply Curve

Issues relating to the aggregate supply curve (AS) will be considered in more detail in Unit 6 that follows. Here we only provide a heuristic justification for the shape of the AS curve, our intention being to focus on demand management policies aimed at coping with unemployment and inflation. In Figure 5.14, we have drawn an AS curve with a positive slope indicating that only at higher and higher prices will the firms supply larger and larger amounts of output.

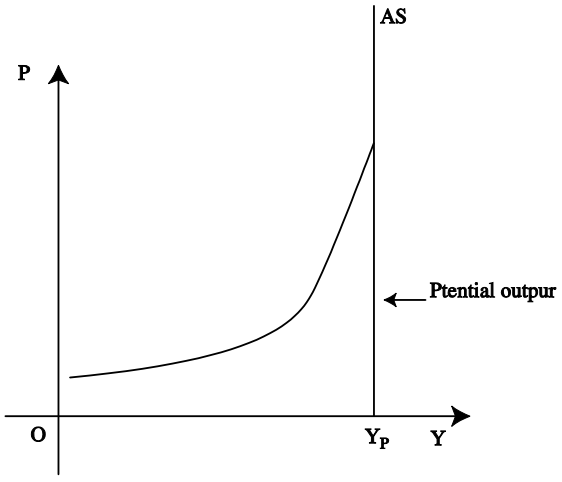

Fig.5.14: The Aggregate Supply Curve

The reason is that as the amount of output produced goes up, inputs become scarcer and costlier, raising the unit costs of production. If the price level is unchanged, profit per unit (the difference between price and unit cost) will fall and production will be less attractive. Therefore, to restore profitability prices have to be raised as output goes up.

The aggregate supply curve becomes steeper as the level of output approaches the potential level

When the output is low and the inputs are plentiful, more output can be supplied with modest increases in prices. But as the capacity output, Yp (also called the potential output) is approached each unit increase in output requires larger and larger increase in prices, because per unit costs rise rapidly. Incidentally, the potential output is the highest output level which the economy is capable of producing given labour and other resources and technological knowledge. All this explains why the aggregate supply curve AS that we have drawn in Figure 5.14 is relatively flat at lower output levels and steep at higher levels of output.

The Complete AD-AS Model: Fiscal and Monetary Policies

Figure 5.15 is intended to show how the price level and the level of output are determined by the interaction of forces acting on the demand and supply sides of the economy. Given the aggregate demand schedule AD_0 and the aggregate supply schedule AS in Figure 5.15, the equilibrium output level is Y_0 and the price level is P_0. The vertical line, Y_p shows the potential output which in the situation depicted is higher than the actual output (supplied and demanded). The output-gap measured by Y_p-Y_0 is known as the recessionary gap. The existance of this gap implies that some of the resources including labour are involuntarily unemployed.

In the AD-AS model, the output level and the price level are jointly determined

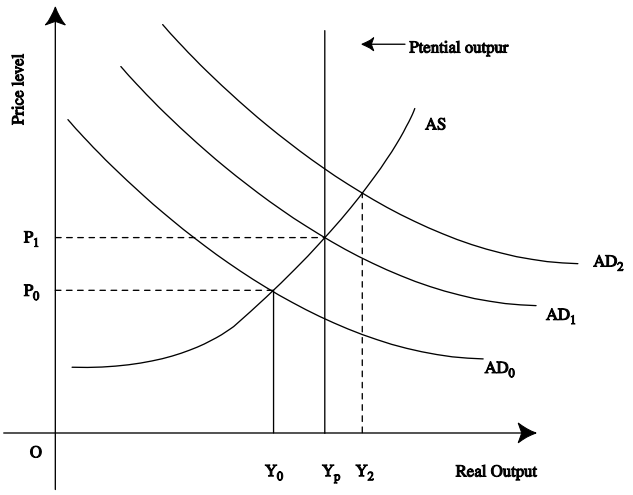

Figure-5.15: Determination of Output and Price Level

Demand management policies can be used to fight unemployment as well as inflation

Unemployment being socially wasteful and undesirable, the government can come forward to combat it with tools of fiscal and monetary policies (supply management is ignored here as a possibility). Clearly the actual output (Y_0) is lower than the potential output (Y_p), because the aggregate demand is not high enough to encourage firms to employ all available resources for production. In other words, the cause of the malady is a deficiency of aggregate demand, and in terms of demand management, expansionary fiscal policy (lowering taxes or raising government expenditures) or expansionary monetary policy (increasing the money supply) can make up for the slack. In terms of Fig.5.15, these policies can shift the aggregate demand to the level shown by AD_1 so that the output gap (and the corresponding unemployment) is eliminated.

Notice that the output expansion is also accompanied by a rise in the price level, which in itself may be a source of concern if inflation is already high. On the other hand, when inflation threatens because the aggregate demand is too high, the authority can resort to contractionary monetary policy (lowering money supply) or contractionary fiscal policy (lowering government expenditures or raising taxes). These are known as demand management policies because these are used to set the aggregate demand at the desired level.

Fiscal-monetary mix can change the output-mix in the desired direction

Since both the fiscal and the monetary policy can be deployed for demand management, one can ask which one should be preferred and when. There is, unfortunately no straightforward answer to this question, because in any concrete situation the decision has to depend on a set of complex issues including what are known as lags in recognition, action and effectiveness of these policies. Moreover, the authority has the option of using both monetary and fiscal policies in different combinations, known as fiscal-monetary mix. By varying the mix of policies the authority can move the compositions of output in the desired direction. For example, an expansionary monetary policy will stimulate investment, while an expansionary fiscal policy will stimulate consumption (and production of consumption goods).

Review Questions

MCQ's (Tick the correct answer)

1. Assume that the IS curve shifts to the right, while the LM stays in its original position. As a result,
   a. the rate of interest will fall and income will rise
   b. the rate of interest will rise and income will fall
   c. the rate of interest and income will both rise
   d. the rate of interest and income will both fall.

2. Suppose that both the IS and LM curves shift towards the right and that both curves have their normal shapes. Which of the following cannot possibly happen?
   a. both i and Y rise
   b. both i and Y fall
   c. i falls while Y rises
   d. Y rises, but i is unchanged.

3. The expansionary effect of a given increase in money supply, will be larger, when the IS curve is
   a. relatively flat
   b. relatively steep
   c. interest sensitivity of investment is high
   d. such that its slope accords with (A) or (B) since they imply the same thing.

4. The expansionary effect of a given increase in government expenditure on income will be larger,
   a. the flatter the LM curve
   b. the steeper the LM curve
   c. the smaller the income responsiveness of the demand for money
   d. when either (a) or (c) holds.

5. the AD curve is steeper,
   a. the larger is the interest responsive of the demand for money
   b. the smaller the interest sensitivity of the investment demand
   c. when either A or B or both hold
   d. when none of the above holds.

6. An increase in the supply of money will
   a. shift the AD curve to the right
   b. shift the AD curve to the left
   c. not shift the AD curve in either direction
   d. shift the aggregate supply curve to the right
7. An expansionary fiscal policy will usually be accompanied by
   a. a fall in the price level
   b. a rise in the interest rate
   c. a rise in the price level
   d. both (b) & (c)

Short Questions

1. What factors determine the slope of the AD curve? How is the slope of the AD curve related to the effectiveness of expansionary monetary or fiscal policies? Examine diagrammatically.
2. What determines the effect of an increase in money supply on equilibrium income? Explain.
3. If the authority is interested to expand output, but does not want the interest rate to rise, what fiscal-monetary policy mix would you recommend and why?
4. Why is it said that the authority can change the composition of output by appropriate changes in monetary-fiscal policy mix?

Broad Questions

1. Diagrammatically explain how the simultaneous equilibrium in goods and asset markets leads to determinate income level and the rate of interest.
2. What does the aggregate demand curve show? How is it derived?
3. Explain with the help of diagram how fiscal and monetary policies can be used to fight unemployment and inflation.

Answer for MCQ's

1. c 2. b 3. d 4. d 5. c 6. a 7. d