



[Academic Script]

IS-LM Curve - I

Subject:

Business Economics

Course:

B. A. (Hons.), 3rd Semester,
Undergraduate

Paper No. & Title:

Paper – 301
Macroeconomics - I

Unit No. & Title:

Unit – 2
IS-LM MODEL

Lecture No. & Title:

Lecture – 1
IS-LM Curve - I

Academic Script

1. Introduction

The IS-LM is a short form of **I**nvestment **S**aving – **L**iquidity Preference **M**oney Supply macroeconomic model. This model was developed by the post Keynesian economists like Hicks & Hansen. Through this model they attempt to synthesize the real sector with the monetary sector. Their approach was to create a general equilibrium analysis of the economy by determining the equilibrium of the real sector and the monetary sector. The IS – investment & saving – curve is related with the equilibrium of the real sector known as “Goods Market”. It shows the equality between aggregate demand (C+I) for output and aggregate supply of output through the movement of income and rate of interest. The LM curve on the other hand is associated with the equilibrium of money market. It shows the equality between the demand for & supply of money through changes in income and rate of interest.

Goods Market Equilibrium: Derivation of IS Curve

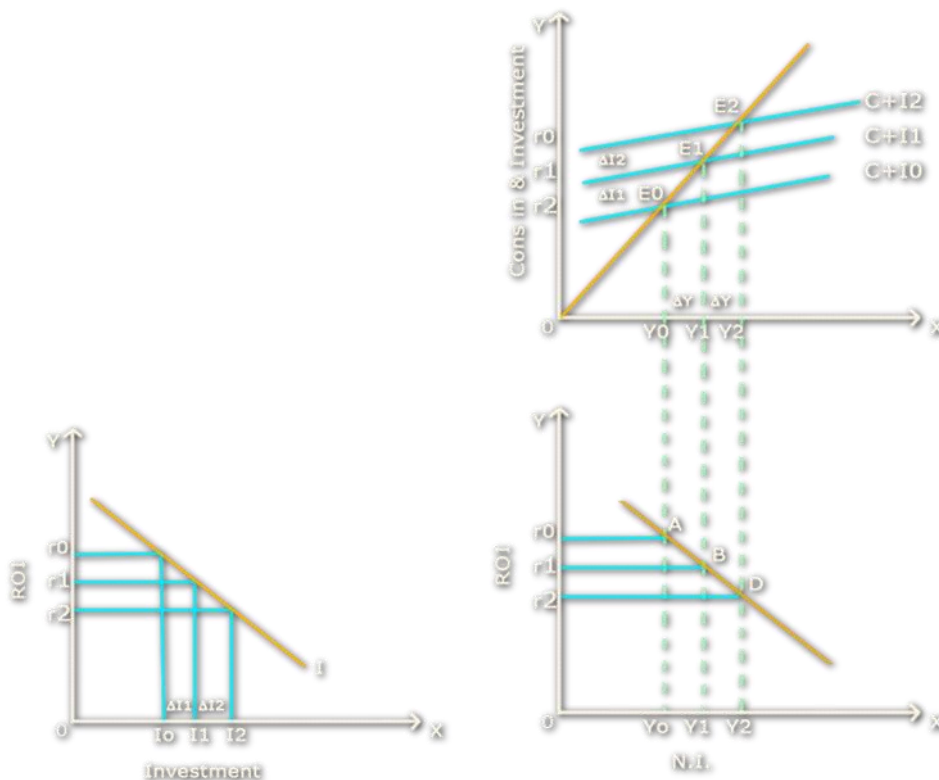
The goods market or the real sector is in equilibrium when aggregate demand for goods is equal to aggregate supply. In Keynesian model of Income determination, the important components of aggregate demand is investment demand which is inversely related with rate of interest. When rate of interest changes the investment demand also changes. This change in investment demand shifts the aggregate demand curve and brings about a change in equilibrium level of income.

Definition: The IS curve is defined as the locus of various combinations of rate of interest and national income where goods market is in equilibrium. When the rate of interest falls

the level of investment increases and vice-versa. Thus, as a result of fall in rate of interest a businessmen will undertake greater investment at lower rate of interest and vice-versa when rate of interest increases.

Figure:

(B)



(A)

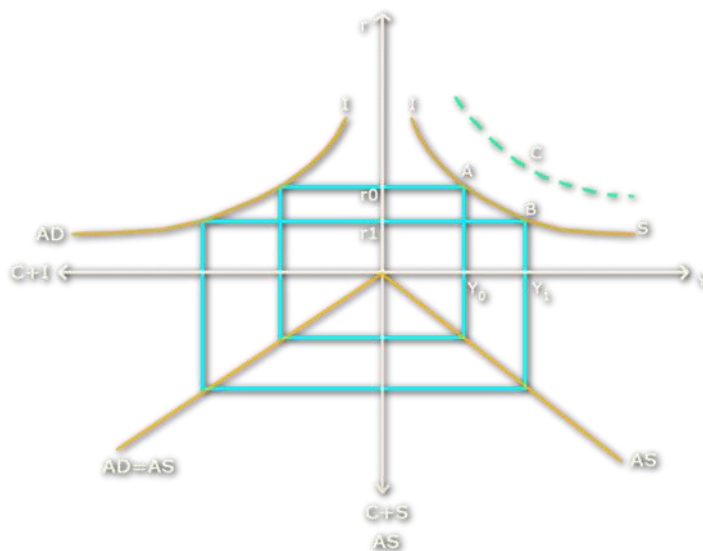
(C)

It is noticed from Part – A that at ' r_0 ' rate of interest planned investment is I_0 investment, aggregate demand curve is $C+I_0$ in part – B. At this aggregate demand equilibrium level of national income is determined at Y_0 . In part – C, Y_0 national income is connected with r_0 rate of interest which is represented by point 'A'. When rate of interest falls from r_0 to r_1 , the profitability of investments rises which increases the planned investment to I_1 . Due to increase in investment, the AD curve shifts from ' $C+I_0$ ' to ' $C+I_1$ ' in part B. As a result, equilibrium level of NI increases to Y_1 . This higher level of national income Y_1 is plotted against the

lower rate of interest r_1 by point 'B' in part C. Similarly, if the rate of interest ROI again falls to r_2 , investments increases to I_2 , AD curve shifts to ' $C+I_2$ ' where NI increases to Y_2 this ' r_2 ' and Y_2 is represented by point D in part C. By joining the points A, B and D the IS curve is derived.

2. Alternative Method of deriving IS – Curve

The derivation of IS – Curve can be explained with four quadratic diagram, shown here;



Reasons of downward IS curve

The nature of IS curve shows that it slopes downward from left to right. The downward sloping can be explained as a chain below,

ROI ↓ \longrightarrow Investment ↑ \longrightarrow AD shifts upward,
 AD shifts upward \longrightarrow equilibrium level ↑ \longrightarrow NI ↑

Thus it can be explained that there is an inverse relation between National Income and Rate of Interest.

The steepness (slope) of the IS curve depends upon two things.

- First the responsiveness of investment demand curve to changes in ROI.i.e. The interest elasticity of investment demand curve.
- The size of the multiplier.

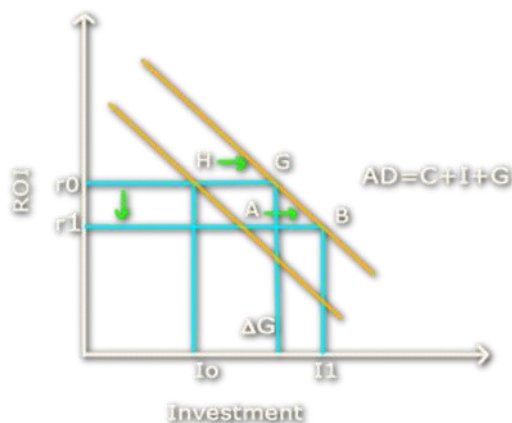
Shifting of IS Curve

It is the level of autonomous expenditure which determines the position of the IS curve and changes in the autonomous expenditure cause a shift in it. The IS curve can be shifted either to the right or to the left. An increase in autonomous expenditure shifts the AD curve upward to the left. It brings about an increase in NI and causes the IS curve to shift to the right. Similarly, a decrease in autonomous expenditure shifts the IS curve to the left.

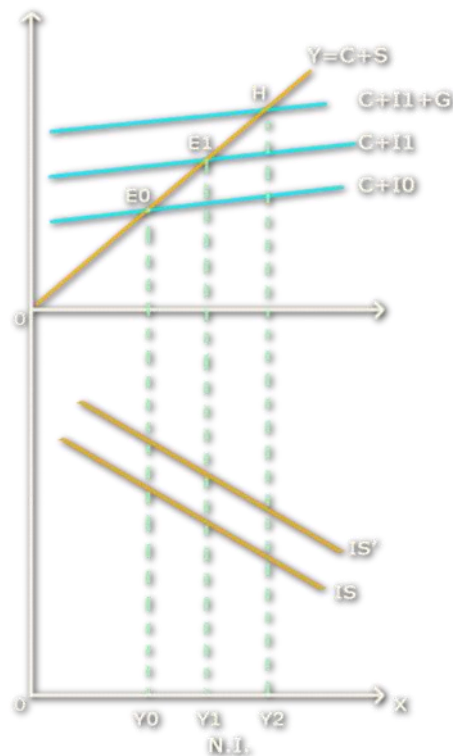
It can be concluded that in a goods market equilibrium, the investment expenditure is treated as autonomous of the level of income and therefore does not vary as the level of income increases. It should be noted that the investment spending in this model is determined by the rate of interest along with marginal efficiency of investment.

Figure

(B)



(A)



(C)

In figure A, with decrease in interest rate from r_0 to r_1 , investment increases from I_0 to I_1 .

In figure B, with the increase in government expenditure, the total expenditure increases from $C+I_0$ to $C+I_1$, when normal expenditure increases shift is to $C + I_1 + G$.

In figure C, NI has increase with the expenditure of the government i.e. contraction and expansion of demand with respect to govt. exp.

3. Money Market Equilibrium

As we know the LM curve is known as liquidity money supply macroeconomic model. The LM curve represents equilibrium in money market, the money market is in equilibrium when demand for money equals supply of money. Demand for money includes both

- Transaction demand and

- Speculative demand.

The transaction demand for money is a function of the level of income. Higher is the level of income, greater is the transaction demand for money which shifts the demand for money curve to higher level. The speculative demand for money is the function of the rate of interest. Given the level of income, higher the ROI, lower is the speculative demand for money, and vice-versa. Thus total demand for money can be expressed as:

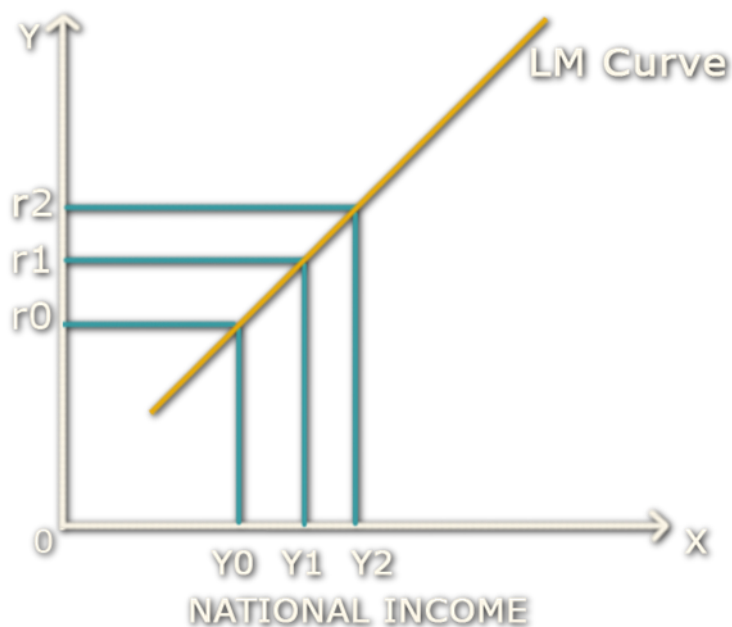
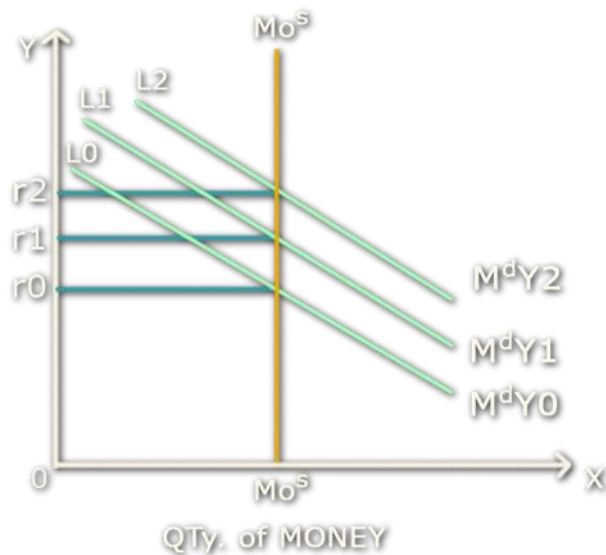
$$L = f(Y, r)$$

L = demand for money, Y= Real money and r = rate of interest.

The LM curve relates the level of income with the rate of interest which is determined by money market equilibrium corresponding to different levels of demand for money. Normally, the supply of money remains constant in the short-run which makes the money supply curve a vertical straight line.

In part A of the fig. L_0 is the demand curve for money at Y_0 income level. When the level of income rises from Y_0 to Y_1 and further shifts to Y_2 , the demand for money shifts to L_1 and further to L_2 . M_s is the supply curve of money which is a vertical straight line. It implies that quantity of money in circulation is constant.

Figure:

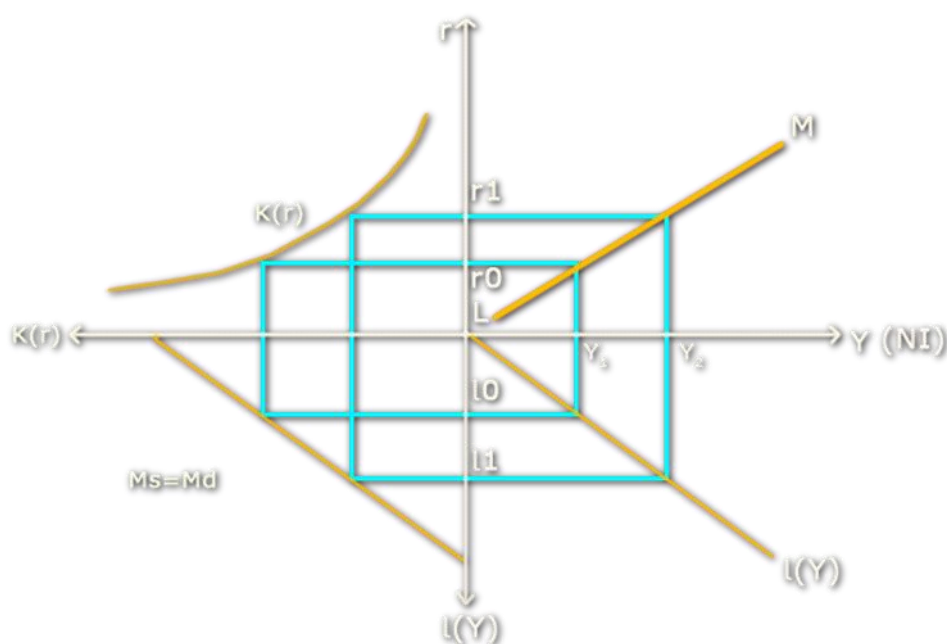


Given the money supply curve, if the demand curve for money is L_0 , equilibrium ROI is determined at r_0 . It implies that at r_0 rate of interest Y_0 income level, the money market is in equilibrium. When the demand curve for money shifts to L_1 equilibrium rate of interest rises to r_1 . Again if demand curve for money shifts further to L_2 , ROI again rises to r_2 . Thus there are three different ROI such as, r_0 , r_1 , and r_2 corresponding to three different level of income namely Y_0 , Y_1 and Y_2 at which money market is at equilibrium.

Representing the same level of income on x-axis and corresponding same rate of interest on y-axis, in part B, r_0 , r_1 and r_2 are connected with Y_0 , Y_1 and Y_2 deriving the LM curve. The LM curve thus derived slopes upward to the right. It implies that higher the ROI, higher would be the level of income so as to achieve equilibrium in the money market.

4. Alternative Method of deriving LM – Curve

Alike IS – Curve, LM – Curve also can be explained with four quadratic diagram,



Slope of LM Curve

It is evident from the above figure that there is positive relation between rate of interest and national income. This is because as the income increases the demand for money both for transaction money and speculative money increases, consequently as known a higher rate of interest is derived in the money market. The two factors that determines the slope of LM curve are

- Income elasticity of demand for money. i.e. responsiveness of demand for money to the changes in level of income
- Interest elasticity of demand for money i.e. responsiveness of demand for money to the changes in rate of interest.

Some special features and shift in LM curve

- 1.** It is the schedule of various combination of rate of interest and income, where money market is in equilibrium.
- 2.** It is important to note that, LM curve is flatter if interest elasticity of demand for money is higher and is steeper if interest elasticity of demand for money is low.
- 3.** LM curve shifts right as the stock of money supply increases and towards left as the stock of money supply decreases.
- 4.** LM curve shifts to left hand side if there is increase in the demand for money thus increases the ROI and LM curve shifts to right hand side if there is fall in demand for money thereby ROI falls down and hence creates the demand for excess of money supply.

Thus, LM curve shifts either due to change in demand or change in supply of stock of money. However, the slope of LM curve depends upon rate of interest.

5. Summary

In this topic we have discussed the meaning of IS-LM curve, the role of demand for money and supply of money, the causes of shifting of IS and LM curves and understood the fluctuations of rate of interest determines, income with the help of demand for money and supply of money.