1 IS-LM Analysis–Real and Money Market Equilibrium

The classical, neo-classical and Keynes' liquidity preference theories of interest were found to be indeterminate as they were the vestiges of partial equilibrium analysis. It is emphasised that the determinate solution of rate of interest must be consistent with the general equilibrium analysis. In the present chapter, it is supposed that the economic system consists of goods or real market and the money market. The general equilibrium in such a two-market system can exist if both the markets are simultaneously in equilibrium and the equilibrium rate of interest and income are determined at the same time. Hicks and Hansen evolved the IS-LM analysis for the determination of general equilibrium in the two-market system and for arriving at a determinate solution of rate of interest.

1. GOODS OR REAL MARKET AND DERIVATION OF INVESTMENT-SAVING (IS) FUNCTION

The goods or real market is in a state of equilibrium when saving and investment are equal or the aggregate demand for goods just equals the aggregate supply.

If the amount of saving exceeds investment or the aggregate supply is greater than the aggregate demand, the level of income in the community will have a tendency to decline. On the opposite, if the volume of investment exceeds savings or the aggregate demand for goods is greater than their aggregate supply, the level of income tends to expand. The real market, assuming specific levels of interest rates, determines various levels of income as shown in Fig. 1.

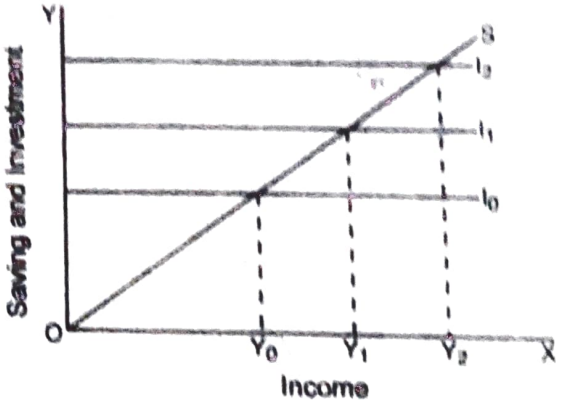

Fig. 1

I_0, I_1 and I_2 levels of investment correspond with the given levels of rate of interest. The intersection of savings function S with I_0, I_1 and I_2 determines Y_0, Y_1 and Y_2 levels of income respectively. This analysis does not determine the rate of interest but simply assumes it. The right approach would be to solve the different equilibrium values of income and the rate of interest. This can be possible through the derivation of what Hicks and Hansen call the Investment-Saving or IS curve. It involves the following goods market relationships :

$I = f(r)$ (Investment Function)

$S = I$ (Equilibrium Condition in the Real Market)

$S = f(Y)$ (Saving Function)

The investment function denotes an inverse relationship between the volume of invesment and the rate of interest. The equilibrium condition postulates an equality between saving and investment in the state of equilibrium. Saving function expresses a direct relation between the amount of saving and the level of income.

If we assume that the levels of investment at 3%, 4% and 5% interest rates are respectively Rs. 100 billion, Rs. 80 billion and Rs. 60 billion, the equilibrium amounts of saving at these given investment levels are Rs. 100 billion, Rs. 80 billion and Rs. 60 billion respectively. If these levels of savings correspond with Rs. 500 billion, Rs. 400 billion and Rs. 300 billion levels of income, it is not difficult to derive the Investment–Saving or IS curve which depicts different levels of income corresponding with the current rates of interest. The derivation of this curve is shown through Fig 2.

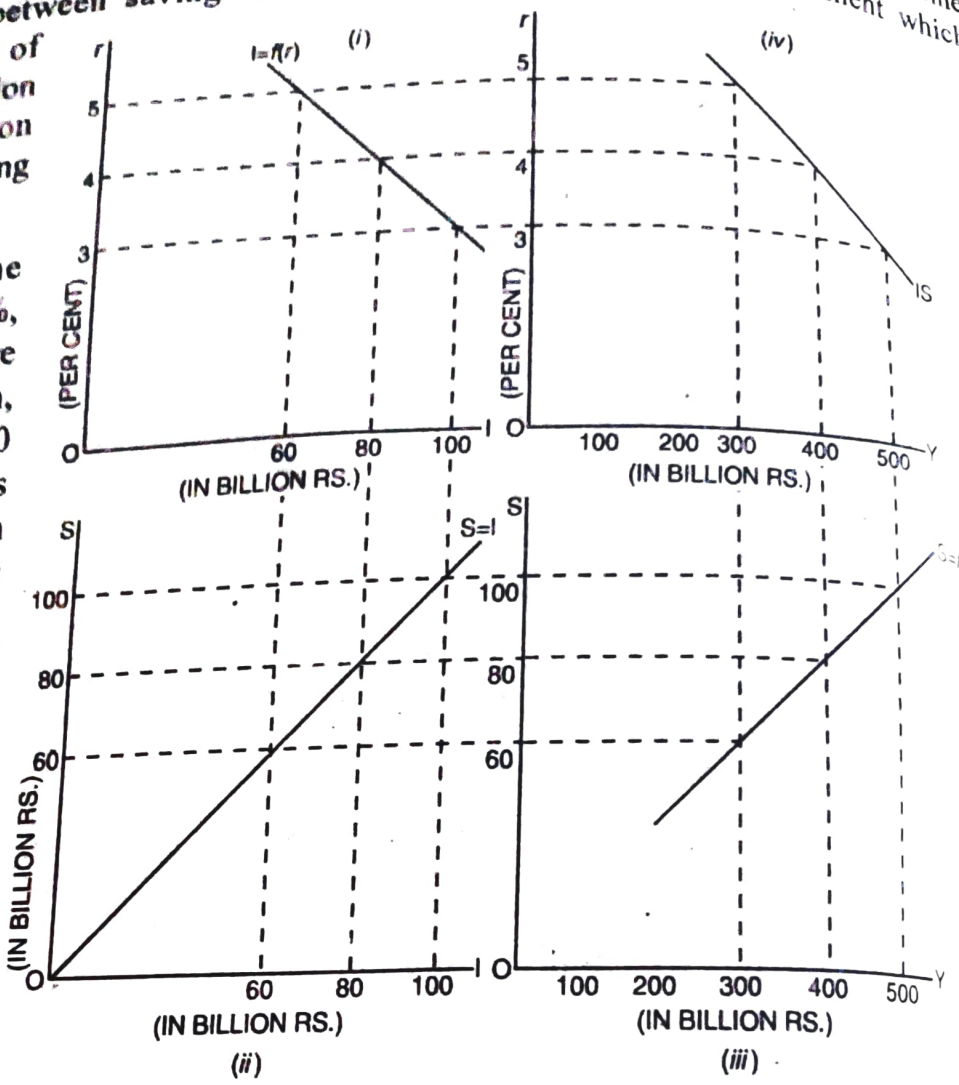

Fig. 2

Fig. 2 parts (*i*), (*ii*) and (*iii*) depict respectively the investment function [$I = f(r)$], the equilibrium conditions ($S = I$) and the saving function [$S = f(Y)$]. The quadrant (*iv*) depicts IS curve which shows the different income-interest combinations which keep the system in equilibrium at least in the goods market.

Since the IS function is based upon S and I functions, the equation of IS curve and the negative slope of IS curve can be derived from the equations of I function ($I = I_0 + er$) and consumption function ($C = C_0 + bY$). Here C_0 and I_0 denote autonomous consumption and investment, b denotes the consumption-income ratio and er, that part of investment which depends upon the rate of interest (r). We s substitute these equations into incom expenditure identity equation.

$$Y = C + I$$

$$= C_0 + bY + I_0 + er$$

$$Y - bY = C_0 + I_0 + er$$

$$Y(1-b) = C_0 + I_0 + er$$

$$Y = \frac{1}{1-b}(C_0 + I_0 + er)$$

$$Y = K(C_0 + I_0 + er) \qquad \left(\because K = \frac{1}{1-}\right.$$

$$Y = K(C_0 + I_0) + K.er$$

This equation is the equation of linear IS curve.

Since K, *i.e.*, investment multiplier $\left(\frac{1}{1-b}\right)$, C_0 and I_0 are positive, the first term of the expression is positive. On the opposite, e being negative, the term ($K.er$) will be negative. As rate of interest rises above zero, Y will decrease and therefore the IS curve will have a negative slope.

Shifts in the IS Function

The position of IS curve depends upon the magnitudes of investment and saving. A decline in intended savings will cause a downward shift in the saving schedule and thereby reduce the leakages generated at all the levels of income. It will bring about a shift in the IS function to the right. Such a shift in the saving function may be caused by the following factors :

(*i*) increase in the wealth of the community ;

(*ii*) the introduction of a new product ;

(*iii*) persistent government deficit resulting in the accumulation of such a large stock of liquid assets in the hands of public that they do not feel any longer the necessity to save at the previous rates ;

(*iv*) expectation of rise in prices and ;

(*v*) shortages of consumer goods.

The IS curve will have a shift to the right, if the investment function increases or shifts to its right. Such a shift can be possible, *firstly,* if there are more and more inventions, discoveries and technological and other innovations and ; *secondly,* if there are better expectations about profits.

The IS function is likely to shift to the left when the saving function registers an increase so that the saving leakage is higher than before or alternatively when the investment function decreases. Thus an upward shift in the saving function or a downward shift in the investment function will bring about a shift in the IS function to the left of its original position. The shifts in the IS function may also be caused by fiscal changes such as government spending, taxes and budgetary policies.

Elasticity of the IS Function

The greater or lesser elasticity of the IS function depends mainly upon two factors *viz.*, the sensitiveness of investment to changes in the interest rate and the magnitude of investment multiplier. If the investment demand function is relatively more interest-elastic, the elasticity of IS function will also be high. On the opposite, a relatively less interest-elastic investment function will be responsible for relatively low elasticity of the IS function. Moreover, the elasticity of IS function is influenced greatly by the magnitude of the investment multiplier or the value of marginal propensity to save (s). The lower the co-efficient s, the greater will be the magnitude of multiplier and the elasticity of IS function will also be high. In the opposite case, if the magnitude of s is higher, the size of multiplier will be relatively smaller and IS function will consequently, be relatively less elastic.

2. MONEY MARKET AND DERIVATION OF LIQUIDITY PREFERENCE—MONEY SUPPLY (LM) FUNCTION

An equilibrium in the money market implies an equality between the demand for and the supply of money.

$$M_D = M_S$$

If the demand for money is greater than its supply, the rate of interest has a tendency to increase under the pressure of increased selling of the bonds in the stock market and a consequent increased preference for cash for the speculative motive. On the contrary, an excess of the supply of money over its demand will make the investors utilise their surplus cash