

2) DERIVATION OF IS-LM CURVE -

The IS-LM model is a fundamental framework in macroeconomics that explain the interaction between the goods market and the money market. The model consist of two curves. The IS (Investment-saving) curve and the L.M (Liquidity-Money) curve.

The IS-LM model is developed by John Hicks in 1937, it provides a comprehensive understanding of interest rate and income levels are determined.

Hicks and Hansen developed a diagrammatic framework to analyse intergration money, interest and income in to a general equilibrium model of Product and money market. This famous model is known as IS-LM model.

The term IS is the short hand expression of the equality of investment and savings which represent the Product market equilibrium. On the other hand the term LM is the short hand expression of the equality of money demand (L) and money supply (m) and represent the

money market equilibrium.

The product market equilibrium

The Product market is in equilibrium when desired savings and investment are equal. Saving is a direct function of the level of income.

$$S = f(Y) \text{ — (i)}$$

Investment is a decreasing function of the investment rate. So,

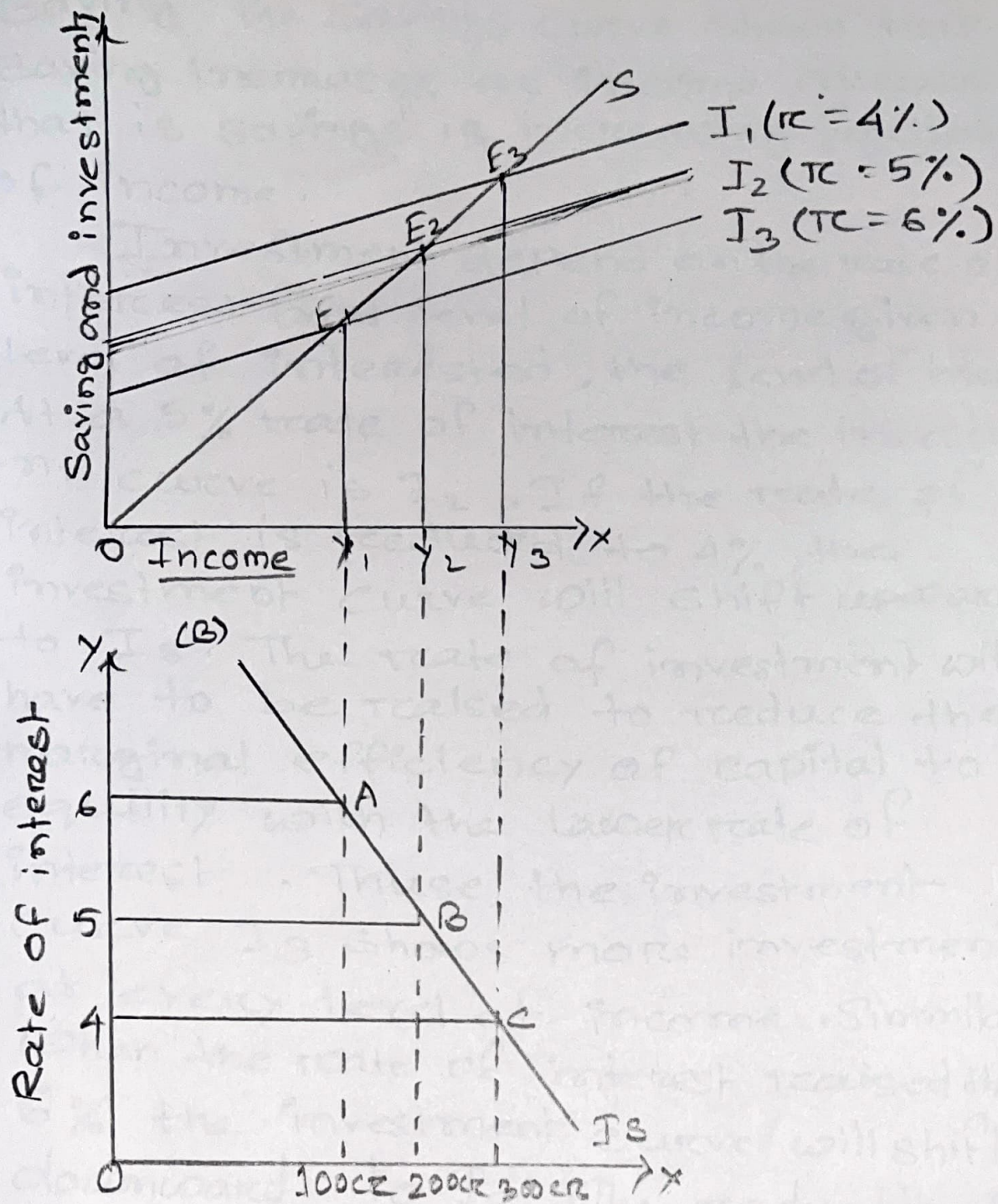
$$I = f(r) \text{ — (ii)}$$

From (i) and (ii)

we have

$$S = I$$

The IS Schedule reflects the equilibrium of the product market. It shows the combination of interest rate and income level where savings investment equality takes place. So that the product market of the economic is in equilibrium. It is also known as reactor equilibrium.



Income figure - I

The derivation of the IS curve is shown in figure A and B. In figure A is saving curve S in relation to income is drawn on the Keynesian assumption that the rate of interest little effect on

Saving. The Savings curve shows that saving increases as income increases that is savings is increasing function of income.

Investment depend on the rate of interest and level of income given a level of interest, the level of income. At a 5% rate of interest the investment curve is I_2 . If the rate of interest is reduced to 4%, the investment curve will shift upward to I_3 . The rate of investment will have to be raised to reduce the marginal efficiency of capital to equality with the lower rate of interest. Thus, the investment curve I_3 shows more investment at every level of income. Similarly, when the rate of interest raised the 6% the investment curve will shift downward to I_1 . The reduction in the rate of interest is essential to raise the MEC with high rate of interest.

In panel B, we derived the IS curve by making the level of income at various interest rates. Each point on this IS curve represent a level of

income at which savings equals investment at various interest rate. The rate of interest rate is represent on y axis and the level of income is represent on x axis. If the rate of interest is 6% the S curve intersect I_2 curve at E_2 . Which determind OY_1 income level from this income level, which equals Rs - 100 cr. We draw a dotted line downward to interest the ascendent line from 6% at point A. At 5% interest the S curve intersect I_2 curve at E_2 . So to determind OY_2 income level ~~(200 cr)~~ and it is represented by Point b in panel B. Similarly the C point corresponds to the equilibrium of S and I_3 at 4% interest rate.

By connecting ABC with a line, we get IS curve. The IS curve slopes the downward from left to right to as the interest rate falls, investment increases, so does income. There is a negative relationship between income and interest rate in product market.

The money market equilibrium:-

The money market is in equilibrium when the demand and supply of money are,

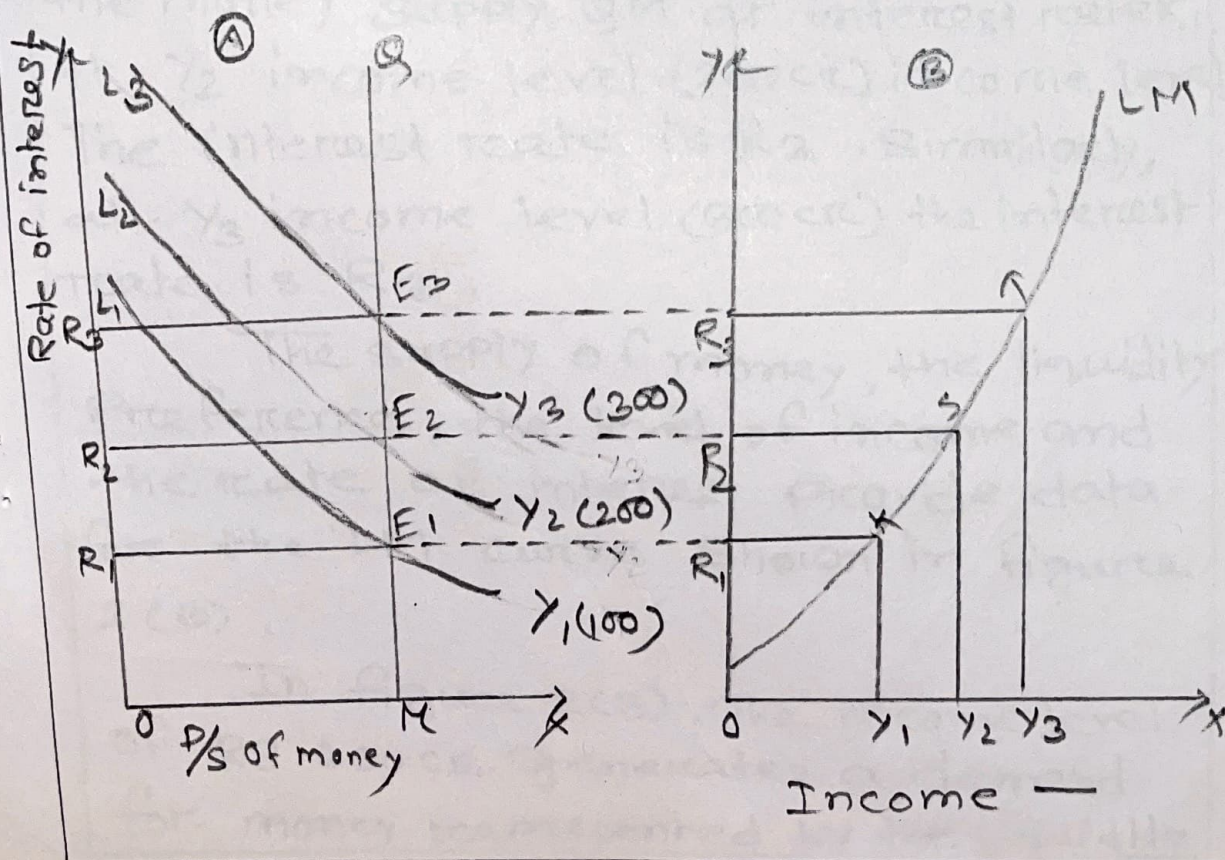
equal. L for money demand, M for money supply in equilibrium $L = M$

The demand for money $L = (L_t + L_p) + L_s$

where, L_t is the transaction demand for money,

L_p is the precautionary demand for money, which is a direct function of the level of income that is $L_t + L_p = f(y)$
 L_s is the speculative demand for money which is decreasing function of the rate of interest $L_s = f(r)$. In money market equilibrium,

$$M = L_t + P(y) + L_s(r)$$



The LM Curve is derived from the Keynesian formulation of liquidity Preference Schedule of supply of money. A set of liquidity Preference curve $L_1\gamma_1$, $L_2\gamma_2$ and $L_3\gamma_3$ is drawn at income levels of RS 100 cr, 200 cr, 300 cr. in figure 2(A). These curves together with the perfectly inelastic money supply curve M_0 . The LM curve consists a series of points, each point representing an interest income level at which the demand for money equals the supply of money.

If the income level is γ_1 (100 cr) the demand for money ($L_1\gamma_1$) equals the money supply M_0 at interest rate R_1 . At γ_2 income level (200 cr) income level. The interest rate is R_2 . Similarly, at γ_3 income level (300 cr) the interest rate is R_3 .

The supply of money, the liquidity Preference, the level of income and the rate of interest provide data for the LM curve shown in figure 2(B).

In figure 2(B). The income level of RS 100 cr generates a demand for money represented by the liquidity

Preference curve L_1Y_1 from the point E_1 , where the L_1Y_1 curve intersects the M_0 curve, extend the dotted line horizontally to the right so as to meet the line drawn upward from γ_1 and K in figure B. Points S and T can also be determined in similar manner, the connecting the point KST we get the LM curve. The curve relates different income levels to various interest rate.