JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

Government of Rajasthan established
Through ACT No. 17 of 2008 as per UGC ACT 1956
NAAC Accredited University

Faculty of Education and Methodology

Faculty Name- JV'n Dr. Md Meraj Alam

Program- BA (Hons) Economics 2nd Semester

Course – Macroeconomics II

Digital session name – IS and LM functions

Introduction

The Keynes in his analysis of national income explains that national income is determined at the level where aggregate demand (i.e., aggregate expenditure) for consumption and investment goods (C +1) equals aggregate output. In other words, in Keynes' simple model the level of national income is shown to be determined by the goods market equilibrium. In this simple analysis of equilibrium in the goods market Keynes considers investment to be determined by the rate of interest along with the marginal efficiency of capital and is shown to be independent of the level of national income. The rate of interest, according to Keynes, is determined by money market equilibrium by the demand for and supply of money. In this Keynes' model, changes in rate of interest either due to change in money supply or change in demand for money will affect the determination of national income and output in the goods market through causing changes in the level of investment.

In this way changes in money market equilibrium influence the determination of national income and output in the goods market. However, there is apparently one flaw in the Keynesian analysis which has been pointed out by some economists and has been a subject of a good deal of controversy.

It has been asserted that in the Keynesian model whereas the changes in rate of interest in the money market affect investment and therefore the level of income and output in the goods

market, there is seemingly no inverse influence of changes in goods market i.e., (investment and income) on the money market equilibrium. It has been shown by J.R. Hicks and others that with greater insights into the Keynesian theory one finds that the changes in income caused by changes in investment or propensity to consume in the goods market also influence the determination of interest in the money market.

According to him, the level of income which depends on the investment and consumption demand determines the transactions demand for money which affects the rate of interest. Hicks, Hansen, Lerner and Johnson have put forward a complete and integrated model based on the Keynesian framework wherein the variables such as investment, national income, rate of interest, demand for and supply of money are interrelated and mutually interdependent and can be represented by the two curves called the IS and LM curves.

This extended Keynesian model is therefore known as IS-LM curve model. In this model they have shown how the level of national income and rate of interest are jointly determined by the simultaneous equilibrium in the two interdependent goods and money markets. Now, this IS-LM curve model has become a standard tool of macroeconomics and the effects of monetary and fiscal policies are discussed using this IS and LM curves model.

Goods Market Equilibrium: The Derivation of the IS Curve:
The IS-LM curve model emphasises the interaction between the goods and money markets. The goods market is in equilibrium when aggregate demand is equal to income. The aggregate demand is determined by consumption demand and investment demand.

In the Keynesian model of goods market equilibrium we also now introduce the rate of interest as an important determinant of investment. With this introduction of interest as a determinant of investment, the latter now becomes an endogenous variable in the model.

When the rate of interest falls the level of investment increases and vice versa. Thus, changes in the rate of interest affect aggregate demand or aggregate expenditure by causing changes in the investment demand. When the rate of interest falls, it lowers the cost c' investment projects and thereby raises the profitability of investment.

The businessmen will therefore undertake greater investment at a lower rate of interest. The increase in investment demand will bring about increase in aggregate demand which in turn will raise the equilibrium level of income. In the derivation of the IS Curve we seek to find out the equilibrium level of national income as determined by the equilibrium in goods market by a level of investment determined by a given rate of interest.

Thus IS curve relates different equilibrium levels of national income with various rates of interest. As explained above, with a fall in the rate of interest, the planned investment will increase which will cause an upward shift in aggregate demand function (C + I) resulting in goods market equilibrium at a higher level of national income.
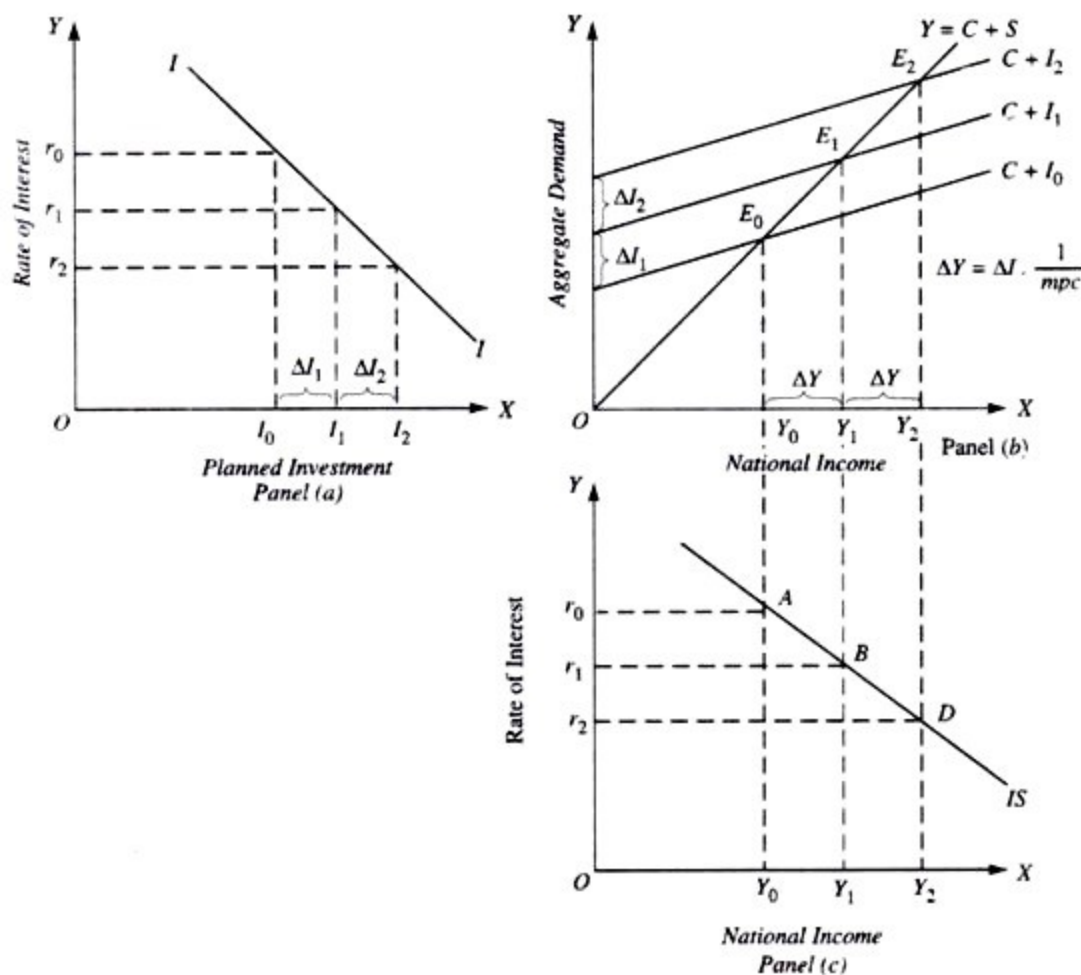

Fig. 24.1. *Derivation of IS Curve : Linking Rate of Interest with National Income through Investment and Aggregate Demand*

The lower the rate of interest, the higher will be the equilibrium level of national income. Thus, the IS curve is the locus of those combinations of rate of interest and the level of national income at which goods market is in equilibrium. How the IS curve is derived is illustrated in Fig. 24.1. In panel (a) of Fig. 24.1 the relationship between rate of interest and planned investment is depicted by the investment demand curve II. It will be seen from panel (a) that at rate of interest Or_0 the planned investment is equal to OI_0. With OI_0 as the amount of planned investment, the aggregate demand curve is $C + I_0$ which, as will be seen in panel (b) of Fig. 24.1 equals aggregate output at OY_1 level of national income.

Therefore, in the panel (c) at the bottom of the Fig. 24.1, against rate of interest Or_2, level of income equal to OY_0 has been plotted. Now, if the rate of interest falls to Or_2 the planned investment by businessmen increases from OI_0 to OI_1 [see panel (a)]. With this increase in planned investment, the aggregate demand curve shifts upward to the new position $C + 11$ in panel (b), and the goods market is in equilibrium at OY_1 level of national income. Thus, in panel (c) at the bottom of Fig. 24.1 the level of national income OY_1 is plotted against the rate of interest, Or_1.

With further lowering of the rate of interest to Or_2, the planned investment increases to OI_2 (see panel a). With this further rise in planned investment the aggregate demand curve in panel (b) shifts upward to the new position $C + I_2$ corresponding to which goods market is in equilibrium at OY_2 level of income. Therefore, in panel (c) the equilibrium income OY_2 is shown against the interest rate Or_2.

By joining points A, B, D representing various interest-income combinations at which goods market is in equilibrium we obtain the IS Curve. It will be observed from Fig. 24.1 that the IS Curve is downward sloping (i.e., has a negative slope) which implies that when rate of interest declines, the equilibrium level of national income increases.

Why does IS Curve Slope Downward?

What accounts for the downward-sloping nature of the IS curve. As seen above, the decline in the rate of interest brings about an increase in the planned investment expenditure. The increase in investment spending causes the aggregate demand curve to shift upward and therefore leads to the increase in the equilibrium level of national income. Thus, a lower rate of interest is associated with a higher level of national income and vice-versa. This makes the

IS curve, which relates the level of income with the rate of interest, to slope downward. Steepness of the IS curve depends on (1) the elasticity of the investment demand curve, and (2) the size of the multiplier. The elasticity of investment demand signifies the degree of responsiveness of investment spending to the changes in the rate of interest.

Suppose the investment demand is highly elastic or responsive to the changes in the rate of interest, then a given fall in the rate of interest will cause a large increase in investment demand which in turn will produce a large upward shift in the aggregate demand curve.

A large upward shift in the aggregate demand curve will bring about a large expansion in the level of national income. Thus when investment demand is more elastic to the changes in the rate of interest, the investment demand curve will be relatively flat (or less steep). Similarly, when investment demand is not very sensitive or elastic to the changes in the rate of interest, the IS curve will be relatively more steep.

The steepness of the IS curve also depends on the magnitude of the multiplier. The value of multiplier depends on the marginal propensity to consume (mpc). It may be noted that the higher the marginal propensity to consume, the aggregate demand curve (C + I) will be more steep and the magnitude of multiplier will be large.

In case of a higher marginal propensity to consume (mpc) and therefore a higher value of multiplier, a given increment in investment demand caused by a given fall in the rate of interest will help to bring about a greater increase in equilibrium level of income.

Thus, the higher the value of multiplier, the greater will be the rise in equilibrium income produced by a given fall in the rate of interest and this makes the IS curve flatter. On the other hand, the smaller the value of multiplier due to lower marginal propensity to consume, the smaller will be the increase in equilibrium level of income following a given increment in investment caused by a given fall in the rate of interest. Thus, in case of smaller size of multiplier the IS curve will be more steep.

Course Outcome: The goal of this paper will be to expose the students to the basic principles of macroeconomics. The emphasis will be on thinking like an economist and course will illustrate how economic concepts can be applied to analyse real-life situations. In

this course, the students are introduced to money and interest, theories of inflation, rate of interest, trade cycle and growth models.