Investment Function

Introduction Besides the consumption function of last chapter, investment function is the second important decider of collective demand. Investment function is also related to national income of economics like consumption function, as show in figure 10.1. In mathematical form I= f(Y). In the analysis of Keynes, consumption function is considered constant in short period. So, investment function becomes main decider of income, production and employment level in economics. It is, not for Keynes and the theorist after Keynes, but also truth for the trade customer theorist before Keynes.

Investment :

The mean of investment is that part of collective production, which can become the form of new plant and capital instrument, new structure and new trade goods. Investment can be divided on different bases.

1.Gross Investment and net Investment

Gross investment is mention the change in new permanent capital property (like House, instrument and industries etc) and material tables (like raw materials, non-saleable) in a certain time period. Gross investment can be show signally like that

$$\Delta Kt \text{ or } It = Kt - K0$$

Here, ΔKt is the change in capital stock in certain time period t, the mean of Kt is the capital stock in last of duration t ko is capital stock in beginning duration. It is known gross investment in the last of duration t. It is not necessary that the gross investment done in capital investment in economy, because one part of new capital will necessary for the establishment of depreciated capital stock. The expenditure on the establishment of depreciated capital during year is known as replacement investment. It is important for maintain the present stock. So, net investment can get to subtract capital investment and replacement investment from gross investment. In other words, to get the net investment, the amount of present total structure and producers invested in producing the production of period and durable equipment are subtracted from gross investment. Briefly,

net investment = gross investment—replacement investment

Or

pure investment = net investment + replacement investment.

When gross investment is only sufficient for keep the capital stock intact, then net investment is equals to the zero. Here gross investment is similar with the amount of capital to spend during period. But when economy is in the grip of recession, new investment symptoms is disappoint. The stock of non-saleable goods are collect in the environment of recession and investor becomes reluctant to take loss for the establishment of depreciating capital equipment. When resolution investment is less then the replacement necessity, then its difference is disinvestment. It shows the reduction in the stock of capital. net investment is only possible, when gross investment is more than the replacement investment. net investment is not only the stopper for development, but it put economy to recession, so people become handle more tremendous strain.

2. Financial Investment and Real Investment : Financial investment means devaluate the authority form one person to another. By this real capital stock of economy is not increase. For example, bank deposit, home by one person, present shares, debentures, and bonds are not generating some thing new. In it only involve the devolution of the authority from one person to another, but total capital of economics is unchanged. When one buyer invested, then other is disinvested. Investor gets some returns by this investment. But, there is no investment for economies.

Apposite it, real investment created more production capacity in economy. The construction of new industry and workshop are the examples of real investment. That work of investment is not only important for that, but also important for economy. Keynes used that investment in national income analysis. It is important for attention that when one person purchases new shares of a company, then different investment will be the indicator of real investment.

3. Planned Investment and Unplanned

Investment Investment is known as planned and intended investment, which inspired the deliberate for expand the present stock by the establishment of an extra instrument or increment in the materials tables. It can be inspired by the condition of favourable market or heavy sells. Entrepreneurs are thought about its investment according to certain time period or decide objective. Apposite it, unplanned investment is the forced investment of entrepreneurs. It happens, when some non-saleable goods are collect because of short sells.It is not necessary that realized investment is equals to the planned investment. Realized investment is equals to the addition of planned or unplanned investment. When unplanned investment is equals to zero, then realized investment is equals to the planned investment. Briefly,

Realized investment = planned investment + unplanned investment

 4. Induced Investment and Autonomous Investment: The classifications of investment in induced and autonomous investment are important in corporate economic analysis. Investment that is dependent on the profit expectation of entrepreneur called induced investment. When entrepreneur hopes the fast sells of produced goods with the help of capital goods, then they generate those capital goods or bring. That prediction is depending on the level of income and effective demand of customer. The level of employment is increase with the increment in the level of income and so the demand of customer goods is increased. That positive functional relation between income and investment is show in figure(i) .
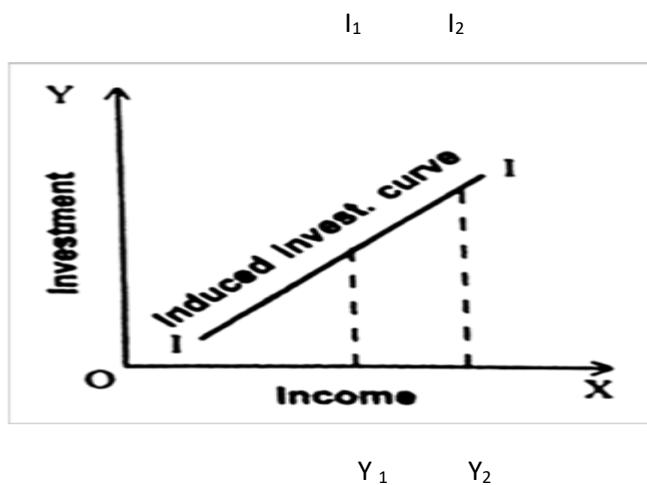
I_1 I_2

Y_1 Y_2

Fig.(i)

In this figure, income is represented on X- axis and investment is represented on Y-axis. The level of investment is increase Y1 I1 to Y2 I2 according to the increment from OY1 to OY2 in income. So induced investment income is elastic. The level of income is such high, investment will more. Besides the income, induced is depend on innovations, government policies, integration and structure of popularity.

Autonomous investment is not effected by the level of income and rate of interest. Mostly investment of population services (like railways, road, light, post and wire) by government is related to that category and division, since the investment of government is not inspire by the only decisional profit or loss. Apposite it, self investment autonomous is not more important. Autonomous investment is flexible for interest; its curve is parallel to X-axis. It shows in figure (3.9) by dotted lines, which shows that the quantity investment is similar on every level of income. Its curve is shifts to upward on the bases of change in technique, search new resources, increment in population and budget allotment for investment. Collective investment can get to add the induced and autonomous investment.
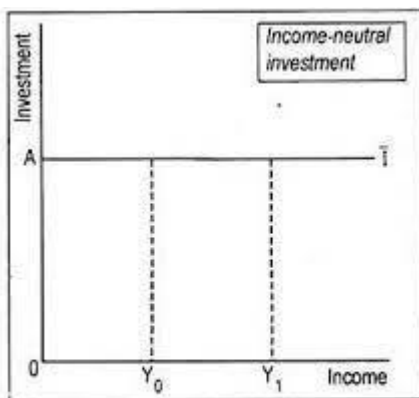

Fig. 3.9 : Autonomous Investment

Political stability is increase the autonomous and induced investment with direct foreign investment.

Induced Investment	Basis	Autonomous Investment
It refers to the investment which is made with the motive of earning profit.	Motive	It refers to the investment, which is made irrespective of level of income.
It is generally done in private sector.	Sector	It is generally done in government sector.
It is income elastic. If national income goes up, induced investment also goes up. Its reason is that increase in NY leads to increase in demand for goods and services and for meeting the same, investment is increased.	Income Elasticity	It is income inelastic, i.e., it is not affected by change in income level. The volume of autonomous investment is the same at all levels of income.
Its curve is upward sloping rises up to Right.	Curve	Its curve is a straight line parallel to horizontal axis.

Marginal Efficiency of Capital:

According to Keynes, the investment in new project is depending on the marginal efficiency of capital and interest rate of market. And the marginal efficiency of capital is decide by the anticipated receipts or profit from the capital property and fulfillment value of capital property.

Supply Price of Capital Asset

When entrepreneurs want to purchase a capital property, then he will pay for those. Its price is says the purchase price of capital thing. Keynes says the establishment cost or supply price of capital property to the cost of property acquisition. It is that price on which new capital property are establish or available. It is possible that the spread-over of total supply of property is spread many years, especially in construction related services. Resultantly, total cost of entrepreneurs is separate from required price. But, that situation is not considered for make simple to present analysis. Besides that, the disposal value of property considers zero.

Prospective Yields from Capital Assets

Prospective yields from capital asset or Expected wealth from income stream is the difference between the sale from production and variable cost during the lifetime. Variable or prevailing cost is the expenditures on raw materials, labours, advertisement, keep and travel.

Every entrepreneur whose decide to purchase new instrument and construct new industry, firstly think about the prospective receipts of assets. Whole capital properties are continuing to long time period and their receipts are spread many years in future. What will be in future, its prediction is more important. The uncertainty in returns of future is because of the uncertainty in goods price and productivity of capital property. If the physical life of property is known, then it is thought to know their economic life because of the possibility of technical changes. Resultantly, before depletion physically the thing is old or obsolete. So, entrepreneur measures carefully its life and income flow in the life duration of capital property.

It is clear from above description that supply price is present cost of asset, but prospective receipts are the future returns of property. The receipts spread in economic life of capital property should be make equivalent to its supply price because future receipts are less costly from the similar present price. Entrepreneurs can not differentiate the block expenditure of future and present receipts on new investment.

Keynes used the 'Annual' word for required annual net return during its life period. On every annual it is far from present such years, the present price of these annual can found by discount. The measurement of compound interest is used in apposite side for discount.

 If one capital price P is gives on compound interest for n years, it will becomes A value to collect. So $A = P (1 + r)n$.

Where r is the rate of interest. In other words, if A, r and n are known, then the value of P is gives as $P = A (1 + r)n$. Here, future income or returns A can be understand discounted equals to A. Its formula is used to get present value of get income after a certain time period. Like that, if future or present cost is given, then we consider the discount rate. For example, if one firm purchase a capital logistic in 1, 00,000 rupees, by that after two month it hopes to get 1,21,000 rupees then annual income can be consider by that formula. Here

$1,00,000 = 1,21,000/(1+ r)^2$

$1 + r = \sqrt{1,21,000/1,00,000} = 1.1$

$r = 0.10 = 10\%$

Receivings in real life gets continuously in the life of capital assets. Let, the series of required future receiving is A1 , A2 , A3 , …………An, here it is the sign of Hereunder the year. P1 , P2 , P3 , ……, Pn are its present price. The total present price of required annual future reciepts are P1 + P2 + P3 + …, Pn. Or

$$PV = \frac{A1}{(1+r)} + \frac{A2}{(1+r)2} + \cdots\cdots\cdots\cdots\cdots \frac{An}{(1+r)n}$$

Here, PV means the total discounted present price of future flow of required income and the investment in capital assets.

$$\frac{A1}{(1+r)}, \frac{A2}{(1+r)2}, \frac{A3}{(1+r)3} \cdots\cdots\cdots\cdots\cdots \frac{An}{(1+r)n}$$

These items are presents the present price of acceptable of required income flow of first year, second year, third year and the last nth year.

Now, there is an important question that should be involved or not in investment projects. If the cost of capital goods is less than the present value of receipts, investment project is beneficial. But, If the investment on goods is more than the income, then should not involve the investment. When both are only equals, then investment become the subjects of indifference.

Illustration :

5 years economic life instrument provides the 1,000 rupees. Its present cost is 35,000 rupees and market rate of interest is 12%. Is it profitable to invest in that instrument?

Solution:

Present value of required receipt

$$PV = \frac{A1}{(1+r)} + \frac{A2}{(1+r)2} + \frac{A3}{(1+r)3} + \frac{A4}{(1+r)4} + \frac{A5}{(1+r)5}$$

$$= \frac{1000}{(1+0.12)} + \frac{1000}{(1+0.12)2} + \frac{1000}{(1+0.12)3} + \frac{1000}{(1+0.12)4} + \frac{1000}{(1+0.12)5}$$

$$= \frac{1000}{(1.12)} + \frac{1000}{(1.12)2} + \frac{1000}{(1.12)3} + \frac{1000}{(1.12)4} + \frac{1000}{(1.12)5}$$

= 892.86 +797.20 +711.78 + 635.52 + 567.43

= 3,604.79 rupees

It is clear, rupees 3604.79 (present value)>3500 rupees (present cost)

An alternate approach can be used by investor, under which the related rate of return (i) is found and it is compared to market rate of interest (r), on which the loanable funds are available for purchasing that asset. To estimate the relative rate of return, all expected receipts are so discounted perfectly that their total current price becomes exactly equal to replacement rate. This discount rate which makes the total current price of expected annual income series in its life time from capital asset equal to capital price of the asset is called as Marginal Efficiency of Capital. In following formula, (i) is the Marginal Efficiency of Capital.

$$C = \frac{A1}{(1+i)}, \frac{A2}{(1+i)2}, \frac{A3}{(1+i)3} \cdots\cdots\cdots\cdots \frac{An}{(1+i)n}$$

Here A1 , A2 , A3 , ……………………..An are the relative expected incomes in the end of first, second, third, fourth, …………….. nth year. C is the supply price of asset and i is the relative rate of return from capital asset. For a definite value of C and A1 , A2 , A3 , ……. An the unique price which satisfy this equation, is called the Marginal Efficiency of Capital (MEC). In Keynes words the Marginal Efficiency of Capital "is that rate of discount which makes the total current price of expected annual income series in its life time from capital asset equal to capital price of the asset."

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