Harrod- Domar Growth Model

Harrod Growth Model

R.F. Harrod tries show in his model how steady (i.e., equilibrium) growth may occur in an economy. He points out the nature of possible paths along which the economy might progress. Once the steady growth is interrupted and the economy falls into disequilibrium, cumulative forces tend to perpetuate this divergence thereby leading to either secular definition or secular inflation. Therefore, Harrod's growth model concentrated largely on the following question:

i) How can steady growth be achieved for an economy with a fixed (capital- output ratio) and a fixed saving-income ratio?

(ii) How can the steady growth rate be maintained?

(iii) How do the natural factors put a ceiling on the growth rate of the economy?

In order to discuss these issues, Harrod had adopted three different concepts of growth rates:

(i) The actual growth rate, G,

(ii) The warranted growth rate, G_w

(iii) The natural growth rate, G_n.

i) The Actual Growth Rate: It is the growth rate determined by the actual rate of savings and investment in the country. In other words, it is determined by the saving ratio and the capital-output ratio. It shows short-run cyclical variation in the rate of growth.

The first fundamental equation in the HM is as follows:

$GC = s$ ..... (1)

Where,

G = actual rate of growth (or $\Delta Y/Y$)

C = the marginal capital output ratio[or $(I/\Delta Y)$]

s = saving income ratio [or (S/Y)]

The eq.(1) explains the simple truth that savings and investment are equal to each other in terms of ratio. Substituting the values of G, C and s in eq.(1) explains this phenomenon:

We have, GC = s

Substituting the values, we get

$(\Delta Y/Y) \times (I/\Delta Y) = S/Y$

or $\frac{I}{Y} = \frac{S}{Y}$

or I = S

The equality between saving and investment (expost sense) is thus a necessary condition for achieving steady growth. It is also called the dynamic equilibrium.

ii) Warranted Growth Rate (Gw): It is the full capacity growth rate of income in an economy. It is also known as 'full employment growth rate' or 'potential growth rate'. The equation for warranted growth can be stated as follows:

GwCr = s ..... (2)

Where,

Gw = warranted growth rate

Cr = amount of capital required to maintain the warranted growth rate

s = saving-income ratio

Eq.(2) states that if the economy is to advance at the steady rate of Gw that will fully utilize its capacity, income must grow at the rate of s/Cr per year, i.e.,

Gw = s/Cr.

If income grows at the warranted rate, the capital stock of the economy will be fully utilized; the entrepreneurs will be willing to continue to invest the amount of saving generated at full potential income. In brief, the warranted growth rate equation in the model implies that actual investment (ex-post investment) must be equal to expected investment (ex-ante investment), if an economy is to achieve stable growth. In such a situation, the following equalities will obtain:

$G = Gw$, and

$C = Cr$

The economy would be in equilibrium. If these equalities do not obtain, the economy will be pushed into a state of disequilibrium if either of the following situations obtain.

a) $G > Gw$

or $C < Cr$

b) $G < Gw$

or $C > Cr$

a) State if disequilibrium when G > Gw

Under this situation, growth rate of income is higher than the growth rate of output. It means that the demand for output (because of higher level of income) would exceed the supply of output (because of lower level of output). The economy would experience inflation. And growth under inflationary situation is not stable. Stated another way, if $C < Cr$, the actual amount of capital falls short of the required amount of capital. This will lead to the deficiency of capital. This, in turn, would adversely affect the goods to be produced. Fall in output would affect the goods to be produced. Fall in output would affect the goods to be produced. Fall in output would result in scarcity of goods, and hence inflation.

b) State of disequilibrium when G < Gw

In this situation, the growth rate of income is less than the growth rate of output. There would be more goods for sale but the income would be insufficient to purchase these goods.

There would be deficiency of demand and the economy would face the problem of over production. Similarly, when C > Cr, actual amount of capital would be larger than the required amount of capital for investment. The larger amount of capital available for investment would lower the marginal efficiency of capital in the long-period. Secular decline in the marginal efficiency of capital would lead to depression and unemployment. Economic growth under the situation of depression cannot be stable.

Steady growth implies a balance between G and G_w. In a free-enterprise economy, it is difficult to strike a balance between G and G_w as the two are determined by altogether different sets of factors. Since a slight deviation of G from G_w leads the economy away and further away from the steady-state growth path, it is called 'knife-edge' equilibrium. It follows that one of the major tasks of public policy is to bring G and Gw together in order to maintain long-run stability.

For this purpose, Harrod introduces his third concept of Natural rate of growth.

iii) Natural Growth-rate (Gn): It is the maximum growth rate that an economy can achieve with its available natural resources. The equation for the natural growth rate can be state as follows:

Gn Cr = or ≠ s ..... (3)

It stated that the natural growth rate is determined by macro variables like population, technology, natural resources and capital equipment. These factors, place a ceiling beyond which expansion of output is not possible. Thus, the natural growth rate is the maximum growth rate which an economy can achieve with its available natural resources.

Interaction between G, Gw and Gn.

Comparing Gw and Gn, it may be concluded that Gn may or may not be equal to Gw. In case, Gn happen to be equal to Gw, the condition of steady growth would prevail. But such a possibility is remote one because a variety of factors (influencing Gn and Gw) come into play and make balance between these two growth-rate difficult. There exists a greater probability of inequality between Gn and Gw. It may take two ways:

a) Gw>Gn

b) Gn>Gw

If Gw>Gn, then G would lie below Gn for most of the time.

In this situation, there would be a tendency for cumulative recession. A downward trend would set in, resulting in unemployment and depression. However, downward trend cannot continue indefinitely. The reason is that lower limit to depression is set by the minimum consumption level. The consumption cannot fall below a minimum level. The minimum consumption requirements can be made possible by reducing the working capital. The entrepreneurs may not reduce fixed capital in the hope that future might entail bright prospects for investment. These two factors would gradually set the wheels of recovery in motion. The economy would experience upward trend.

If Gn > Gw, then G would also exceed Gw for most of the time,

There would be a tendency for cumulative boom and full employment. Such a situation will create inflationary trend. To check this trend, savings should be encouraged, as these would ensure a high level of employment without inflationary pressures.

It is argued that in developing countries low rates of economic growth and development are linked to low saving rates.

This creates a vicious cycle of low investment, low output and low savings. To boost economic growth rates, it is necessary to increase savings either domestically or from abroad. Higher savings create a virtuous circle of self-sustaining economic growth.

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