The Harrod-Domar Growth Model

The Harrod-Domar models of economic growth are based on the experiences of advanced capitalist economies to analyse the requirements of steady growth in such economy. The Harrod-Domar economic growth model stresses the importance of savings and investment as key determinants of growth. The model emphases on the dual character of investment:

1. It creates income which is regarded as the 'demand effect'.
2. It augments the productive capacity of the economy by increasing its capital stock which is regarded as the 'supply effect' of investment.

The main assumptions of the Harrod-Domar models are as follows:

1. A full-employment level of income already exists.
2. There is no government interference.
3. The model is based on the assumption of closed economy.
4. There are no lags in adjustment of variables.
5. The average propensity to save (APS) and marginal propensity to save (MPS) are equal to each other. Symbollically, $S/Y = \Delta S/\Delta Y$
6. Both propensity to save and "capital coefficient" (i.e., capital-output ratio) are given constant.
7. Income, investment, savings are all defined in the net sense and hence they are considered over and above the depreciation.
8. Saving and investment are equal in ex-ante as well as in ex-post sense.

The Harrod Model:

An English economist, Henry Roy Forbes Harrod (13 February 1900 – 8 March 1978) tries to show in his model how steady growth may occur in the economy. Once the steady growth rate is interrupted and the economy falls into disequilibrium, cumulative forces tend to perpetuate this divergence thereby leading to either secular deflation or secular inflation.

The Harrod Model is based upon three distinct rates of growth as below:

1. The actual growth rate (G)
2. The warranted growth rate (G_w)
3. The natural growth rate (G_n)

1. The actual growth rate (G): It is defined as the ratio of change in income (ΔY) to the total income (Y) in the given period. Mathemaically; $G = \Delta Y/Y$

The actual growth rate (G) is determined by:

(a) Saving-Income ratio (s) known as the Average Propensity to Save which is expressed as $s = S/Y$

(b) Capital- Output ratio (C) which is expressed as $C = \Delta K/\Delta Y$ where ΔK denotes change in Capital stock which equal investment (I)

$$G \cdot C = s$$

$$\frac{\Delta Y}{Y} \times \frac{\Delta K}{\Delta Y} = \frac{S}{Y}$$

$$\frac{\Delta Y}{Y} \times \frac{I}{\Delta Y} = \frac{S}{Y}$$

$$I = S$$

ΔK = change in stock of capital = Investment = I

ΔY = growth rate of income, $G = \Delta Y/Y$

Steady state growth condition

steady state growth condition

full-capacity growth rate. ΔK

Gw = Cr

2. The warranted growth rate (G_w): Warranted growth Rate also known as Full-capacity growth rate refers to that growth rate of the economy when it is working at full capacity. In other words, G_w is interpreted as the rate of income growth required for full utilization of a growing stock of capital.

Warranted growth rate (G_w) is determined by capital-output ratio and saving- income ratio and their relationships is expressed as:

$$G_w C_r = s$$

or $$Gw = s/Cr$$

where ;

C_r denotes the amount of capital-output ratio needed to maintain the warranted (Gw)

s denotes the saving-income ratio.

The above equation reflects that if the economy is to advance at the steady rate of Gw at its full capacity, income must grow at the rate of s/Cr per year.

3. The natural growth rate (G_n): The natural growth rate also known as the potential or the full employment rate of growth is the rate of economic growth required to maintain full employment. The natural growth rate regarded as 'the welfare optimum' by Harrod is the maximum growth rate which an economy can achieve with its available natural resources.

The Natural growth rate is determined by natural conditions such as labor force, natural resources, capital equipment, technical knowledge etc. The third fundamental relation in Harrod's model showing the determinants of natural growth rate is expressed as: $G_n C_r = \text{or} \neq s$

GnCr = s (equil)
GnCr ≠ s (not used to fullest)

Condition for the Achievement of Steady Growth:

According to Harrod, the economy can achieve steady growth when there is equality between G and G_w at the same time between C and C_r. This condition can be expressed as:

$G = G_w$ and $C = C_r$ (equilibrium)

Harrod states that a slight deviation of G from G_w will lead the economy away and further away from the steady-state growth path. Thus, the equilibrium between G and Gw at this junction is considered as a knife-edge equilibrium.

Harrod

Disequilibrium (imp)

(i) G > Gw (excess demand) & C < Cr ⇒ inflation in economy.

(ii) G < Gw (excess supply) ⇒ deflation.

(ii) $G < G_w$ (excess supply) ⇒ deflation.
$C > C_r$ (unused capital ↑ productivity ↓ ⇒ stagnation)

Interaction with G, G_w and G_n

(i) if $G > G_w$
⇒ $G_n > G_w$
⇒ Boom, full employment.
⇒ creates inflationary trend.

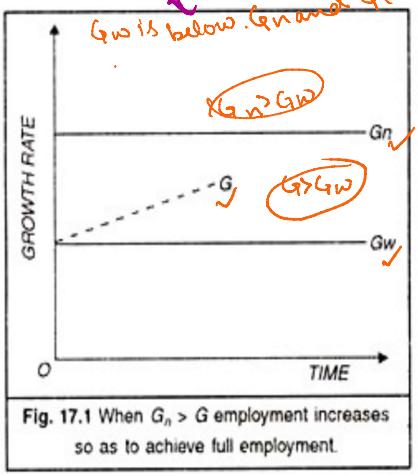

Fig. 17.1 When $G_n > G$ employment increases so as to achieve full employment.

(ii) if $G < G_w$
⇒ $G_n < G_w$
⇒ recession
⇒ unemployment.

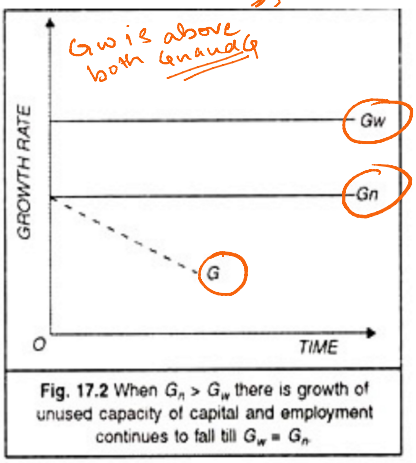

Fig. 17.2 When $G_n > G_w$ there is growth of unused capacity of capital and employment continues to fall till $G_w = G_n$.