
UNIT 4 GROWTH AND DISTRIBUTION

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4.0 OBJECTIVES

After going through the unit, you will be able to:

state the nature of the investment function as determined by decisions of capitalists;

Describe a set of growth theories in which growth and income distribution emerge as intertwined processes;

Provide a critique of the neo-classical conception of saving and investment; and

Discuss and compare theories of distribution and growth put forward by Joan Robinson, Kaldor, Kalecki and Pasinetti.

4.1 INTRODUCTION

Growth theory that appeared in economic literature after the publication of Keynes' General Theory in 1936 is usually referred to as modern growth theory, which tried to make dynamic, the short-run static growth theory evolved by Keynes. Broadly there are three major branches of modern growth theory.

One relates to the growth rate of economy's aggregate output to that of its capital stock. In this approach capital is the only factor of production, explicitly considered and it is assumed that labour is combined with capital in fixed proportions. It holds that under laissez faire conditions there is no effective adjustment mechanism to equate investment with savings at full employment level. This fixed-proportion theory is commonly known as the Harrod-Domar theory. This approach to the growth theory rapidly changed and the theory that dominated after is known as neoclassical growth theory. This theory considers a production function where capital and labour is employed in varying proportions. The theory gives an explanation, similar to classical theory where full-employment savings will be watched by an equal amount of planned investment provided there is full utilisation of the factors of production.

A third branch of modern growth theory is described as modern Cambridge theory because of its close association with names like Joan Robinson and Nicholas Kaldor of Cambridge University. This theory is highly critical of neoclassical theory in many ways. For example, it rejects the classical approach to savings and investment given by neoclassical theory. Cambridge theory returns to Keynesian approach where investment is determined not by saving propensities but by capitalists' decisions, which, in fact, are considered to be dependent upon past experience, government policies and the willingness to bear risk. It also rejects production function and with it the entire marginal productivity theory of income distribution and offers alternative theories. The Cambridge school therefore presents both a theory of income distribution and theory of growth with its unique feature of incorporation of a Keynesian theory of income distribution.

4.2 JOAN ROBINSON'S MODEL OF ECONOMIC GROWTH AND CAPITAL ACCUMULATION

A major approach to growth theory was provided in 1956 by Mrs. Joan Robinson in her classic book 'The Accumulation of Capital'. The main contribution of Mrs. Robinson to Post-Keynesian growth economics lies in her successful bid to integrate the classical value and distribution theory with Keynes' saving-investment theory into a synthesised coherent system.

4.2.1 Assumptions

Mrs. Robinson builds her model on the following assumptions.

- 1) The economy is assumed to be closed one i.e. there is no foreign trade.
- 2) Such an economy reflects the conditions of a competitive, laissez-faire capitalism.
- 3) There are only two factors of production viz; capital and labour.
- 4) The technical horizon is assumed to be given and constant
- 5) The technical coefficients of production are fixed.

Where C, S, I is consumption, savings and investment respectively. As savings in Mrs. Robinson's Model are the sole prerogative of the entrepreneurs, wage-earners being assumed to consume their entire incomes; profits are, therefore meant to be ploughed directly into investment. As such we can write the equation (iv) in the following form:

$$S = \Pi K = I \quad \dots (v)$$

Instead of I , we can substitute ΔK which is the increase in real capital.

$$\text{i.e.,} \quad \Delta K = \Pi K$$

$$\text{or} \quad \Pi = \Delta K / K \quad \dots (vi)$$

for getting equilibrium, we simply have to juxtapose the income and expenditure sides. Thus equilibrium condition(s) are

$$\Pi = p \cdot w / p / Q = \Delta K / K \quad \dots (vii)$$

This equilibrium condition manifests a double-sided relationship between the rate of profit and rate of accumulation. On the one hand, it tells us that the rate of accumulation going on in a particular situation determines the level of profits obtainable there from. It determines the rate of profit which the entrepreneurs would expect on their investment. On the other hand, the equilibrium condition shows that the rate of profit itself governs the rate of accumulation. Anything that determines the rate of profit would also determine the rate of growth of capital.

Accumulation and profit are, therefore, linked with each other in a circular way. "if they have no profit, the entrepreneurs can not accumulate and if they do not accumulate they have no profit." Thus, the basic mechanism underlying Mrs. Robinson's growth model is the desire of the firms to accumulate and the urge to accumulate is dependent on the expected rate of profit.

4.2.3 The Golden Age

The situation of smooth steady growth with full employment arising out of the equality of the 'desired' and 'possible' rates of accumulation has been designated by Mrs. Robinson as the 'golden age' equilibriums.

Suppose Q is constant under the conditions of full employment, then from the equation $K/N = Q$ we get,

$$K = QN$$

$$\therefore \Delta K = \Delta N Q$$

$$\text{or } \Delta N = \Delta K / Q$$

$$\text{or } \Delta N / N = \Delta K / Q / N = \Delta K / Q / K / Q \quad (\because N = K / Q)$$

$$\text{or } \Delta N / N = \Delta K / K \quad \dots (viii)$$

The equation (viii) implies that if Q is constant at the full employment level, their labour and capital grow at the same rate. This is the situation of 'golden age' equilibrium. The equality between the desired and possible rates of accumulation coexists with full employment of labour and capital. Besides, both labour and capital grow at the same rate. The economy is thus on a tranquil steady growth path – "a steady rate of accumulation than rolls smoothly on its way". There is harmony in all respects.

The entrepreneurs are in a state of equilibrium. As their desired rate of accumulation is being realised, the wage-earners, on the other hand, are in equilibrium state because there comes to prevail an overall harmony in the demand and supply of labour.

Stability of 'Golden Age' equilibrium: if certain forces operate so as to disturb the 'golden age' equilibrium of the economy, equilibrating mechanisms automatically come into being to restore the equilibrium. Let us see how?

The divergence from the 'golden-age' equilibrium path will take place if:

- a) $\Delta N/N > \Delta K/K$
- or
- b) $\Delta N/N < \Delta K/K$

In case (a), the population will grow faster than the capital stock. This signifies the situation of underemployment with the prevalence of surplus labour, money wage rates get depressed. But if price level is to remain unchanged the real wages will have to fall.

Now if real wages start falling, then as is clear from the basic equilibrium equation (vii), the rate of profit will ascend gradually. As such the rate of growth of capital accumulation will go on moving up till it catches up with the rate of growth of population. And the 'golden-age' equilibrium, would thus, again be established. However, the equilibrium would fail to be restored if the money wages remain inflexible or if the price level falls in consonance with the fall in the money wages.

Case (b) or the second possibility for divergence from the 'golden age' equilibrium occurs where $\Delta N/N < \Delta K/K$, i.e., the rate of population growth falls short of the growth rate of capital-stock. Such a situation manifests a state of excess capital accumulation. It can be seen that under such circumstances, appropriate changes in the capital-labour ratio (Q) or the labour productivity (P) can help to regain the 'golden age' equilibrium.

Limping golden age: Under this age, steady rate of accumulation coexists with unemployment. It is just possible that sufficient capital stock with a composition quite appropriate to the desired rate of accumulation exists. But it may not be enough in so far as the employment of the entire labour force is concerned. The steady rate of accumulation is taking place, but the conditions of full employment have not been achieved. Mrs. Robinson christens such a state of affairs as the 'limping golden age'.

The intensity of the limp may be of different degrees depending on the rate of fall or rise in employability vis-a-vis the labour force. If the rise in the level of employment occurs at a rate smaller than that of labour force, unemployment would increase with time. The limp in this case is rather severe.

However, if the rise in the level of employment occurs at a rate greater than that of labour force employment would increase more rapidly than the labour force, and, therefore, unemployment will shrink with time and the economy approached full employment rather quickly. The limp here is thus mild and it tends to die away in the long run. As such this age will be a transient one.

Leaden Age: It, in fact, is a special case of a 'limping golden age' in which the degree of unemployment is increasing due to inadequate rate of accumulation.

Restrained golden age: This is an age of full employment but the 'desired rate' of accumulation happens to exceed the 'possible rate' determined by the rate of growth

of labour force plus the rate of technological progress. The possible rate is kept down by factors such as financial stringency or monopsony in the labour market, so that the 'realised rate' of growth is kept down to the level of the 'possible rate'.

It may so happen that the stock of capital is appropriate to the desired rate of accumulation and the full employment has already been achieved. But it may fail to be realised on account of its being restrained by a stunted rate of growth of labour force and the rate of technical progress.

Bastard golden age: It denotes a situation where unemployment prevails but the real wages remain rigid downwards. As such the rate of accumulation is prevented from increasing in the absence of technical progress. The ultimate cause of less than adequate growth of capital stock may lie in the existence of an 'inflationary barrier'.

For the rate of accumulation to be raised, it is necessary to lower down the real wages. But generally there is some level of minimum acceptable real wages so that when prices rise, some increase in money wages follows due to the attempts of the organised labour to resist the erosion of real wages below the minimum acceptable level. Thus the attempts to raise the rate of accumulation would be arrested by the inflationary rise in money wages. This is the 'bastard golden age'.

4.2.4 Criticism

Mrs. Robinson's model is not free from flaws. Some of the main drawbacks are as follows:

- 1) **Only the various forms of Growth Process:** This model provides only a framework of studying the various forms of growth process. We can not predict on the basis of the model as to what possibly shall be the succeeding phase or type of growth. The different types of growth that have been analysed are left as 'isolated islands' in her model. The inter-connecting straits have not been explored.
- 2) Secondly, Mrs. Robinson studies that the prime variable of her model, viz., the rate of capital accumulation gets adjusted to the population growth via adjustments in wage rate, profit rate and labour productivity. This tantamount to suggest redistribution of income through relative factor prices, but it would be more practical and realistic to deploy fiscal and monetary measures for making adjustment in capital growth with population growth.
- 3) **Neglects Role of State:** Thirdly, in Robinson's model, state has been completely left out of the picture. It is indeed unrealistic and precarious to rely solely on the private entrepreneurs for the achievement of a stable growth of the economy in tune with the requirements of a growing population and rapidly changing technology.
- 4) **Wrong Assumption of constant technique:** This model is carried out under the assumption of a given and constant technological horizon, but is unrealistic. For instance, under the given technical conditions when the rate of accumulation happens to be higher than what is required for achieving the 'golden age' equilibrium, it will *ipso facto* alter the pace of technological progress. What is likely to happen in this case is that due to the pressure on the labour-supply, labour-saving innovations and inventions would be stimulated. Besides, there will be inducement for quick diffusion and introduction of labour-displacing technical improvements which had so far been held back due to an abundant and cheaper supply of labour.
- 5) It neglects the role of institutional factors as social cultural and institutional changes, on which the development of the economy considerably depends.

4.3 KALECKI'S THEORY OF DISTRIBUTION UNDER MONOPOLISTIC CAPITALISM

Kalecki was contemporary of Keynes and a Polish economist. He wrote on diverse aspects of economic theory, however, is known more for his theory on business cycles, pricing and degree of monopoly. As compared to other theories, his essay on the theory of growth came at a later stage in 1969 when he wrote - "Introduction to the Theory of Growth in a Socialist Economy". Kalecki's theory of distribution is dependent upon A.P. Learner's Microeconomic degree of Monopoly. Symbolically, it is denoted as $P-m/p$; where p stands for price and m stands for marginal cost. In other words, $p-m$ stand for profit share at micro level.

In Kalecki's formulation of the degree of monopoly, marginal cost includes cost of labour and raw materials per unit of output. Further, cost of labour includes only wages of manual labour since salaries of white collar people are merged with the earnings of the capitalist class. Thus $p-m$ indicates the income of the capitalist class including entrepreneurial profit and aggregate overhead cost i.e. interest, depreciation and salaries, per unit of output.

4.3.1 Assumptions

While discussing a theory of distribution, Kalecki postulated a closed economy and assumed

- That the short period marginal cost curve is equal to short period average cost on manual labour and raw materials to a certain point corresponding to practical capacity.
- that output in the firms in the real world is less than the maximum practical capacity. Thus in other words, he assumes the existence of excess capacity in the economy. and
- that there is imperfection in factor and commodity market.

4.3.2 The Model

Since Kalecki starts from Learner's measure of degree of monopoly of a single firm. For Learner's Degree of Monopoly;

$$M = \frac{P - m}{P}; \text{ where } M \text{ is degree of monopoly, } p = \text{price and } m = \text{marginal cost}$$

Since Kalecki assumes that marginal cost is equal to average cost, we can replace it in the formula and the equation can be rewritten as

$$M = \frac{P - a}{p} \quad \dots (i)$$

$$\text{or } pM = (p - a) \quad \dots (ii)$$

$(p-a)$ is the difference between price of the product and average cost of manual labour and raw materials per unit of output. Thus the difference $(p-a)$ is made up of profit share of a single employer on a single product. Let x be the total production of the firm. Multiplying equation 2 by x we get

$$\text{or } xpM = x(p-a) \quad \dots (iii)$$

$x(p-a)$ represents the total gross capitalists' income of the employer. In order to get gross capitalist's income for the economy, where there is large number of firms; we add the gross capitalist's income of all firms in the economy;

$$\sum xpM = \sum x(p-a) \quad \dots (iv)$$

$\sum x(p-a)$ equals the gross capitalists' income of all the firms of the economy taken together, $\sum xp$ represents aggregate turnover (T) of the economy. Thus $T = \sum xp$. Since T is made up of the value of gross national product and plus the value of the raw materials produced and sold; dividing both sides of the equation (4) by T, we get

$$\frac{\sum xpM}{T} = \frac{\sum x(p-a)}{T}$$

but $T = \sum xp$ so

$$\frac{\sum xpM}{\sum xp} = \frac{\sum x(p-a)}{T} \quad \text{or we get, Macro degree of monopoly } (\bar{M})$$

$$\bar{M} = \frac{\sum x(p-a)}{T} \quad \dots (v)$$

$$\text{or Macro degree of Monopoly} = \frac{\text{Gross Capitalist Income}}{\text{Aggregate Turnover}}$$

Thus the equation (5) indicates that there is positive functional relationship between the macro degree of monopoly enjoyed in an economy and its gross capitalist share, provided the aggregate turnover remains constant.

4.3.3 Labour Share and Degree of Monopoly

Kalecki points out that during boom period competition increase, which reduces the degree of monopoly. The reduction in degree of monopoly tends to raise the share of labour in national income. However the rise in the price of raw material tends to reduce it. **Thus** the two forces work against each other and in boom period the relative shares of labourers' and capitalists' remain constant.

4.3.4 A Critical Appraisal

Kalecki's theory of distribution is an attempt to reinstate Marxian theory of distribution. Despite his significant contributions he has been criticised on many fronts. He is criticised by attributing only profits to the degree of monopoly power and ignoring other factors that affect distributive shares. The theory is based on unreal assumptions where marginal cost is equal to average cost. This is possible only when there are constant returns prevalent in the market. The theory also appeared to have ignored the role of trade unions. In his later contributions, however, he recognised this drawback and tried to justify their contribution while discussing theory of growth of a socialist economy.

- 1) Explain the concept of Golden Age Equilibrium in Joan Robinson's Model.

[illegible]

- 2) What are the main criticisms that can be made of Joan's model?

[illegible]

- 2) State the main assumptions and describe the **Kaleckian** model of distribution under monopolistic competition.

[illegible]

4.4 KALDOR'S MODEL OF ECONOMIC GROWTH

Prof. Kaldor in his 'A Model of Economic Growth' follows the Harrodian dynamic approach and the Keynesian techniques of analysis. The other classical models treat the technical progress as completely exogenous, but Kaldor attempts to provide a framework for relating the genesis of technical progress to capital accumulation.

4.4.1 Assumptions

- 1) It is based on the Keynesian full employment assumption in which the short-period supply of aggregate goods and services is inelastic.
- 2) Income consists of wages and profits where wages comprise salaries and earnings of manual labour and profit comprise incomes of entrepreneurs as well as property owners. i.e. $y = w + p$.
- 3) Total savings consists of savings out of wages and savings out of profits,
Since $S = f(Y)$ & $y = w + p$
 $\therefore S = f(w, p)$
i.e. $S_w + S_p = S$
- 4) Profits in the economy are a function of investment
- 5) Prices are assumed to be constant i.e. monetary policy has a very little role to play.
- 6) The choice of techniques is also assumed to alter with the accumulation of capital and the progress of technique is the capital-grade making industries.
- 7) Technical progress depends on the rate of capital accumulation. For this, Kaldor postulates "the technical progress function" which is a joint product of two tendencies: growth of capital and growth of productivity. As in figure 1, TT' is the technical progress function which is convex upwards but flattens out beyond a certain point, such as P in the figure when capital per workers starts diminishing. The annual percentage growth in capital per worker at time t is measured on x -axis and output labour ratio on y -axis. At point P , $C/L = Y/L$. If the rate of capital accumulation is left of P , output will be growing faster than capital and the rate of profit on new investment will increase. There will be movement towards right till point P is reached, on the contrary if one happens to be on the right of P , capital will be growing faster than output, the rate of investment will decline and there will be movement towards left till point 'P' is reached.

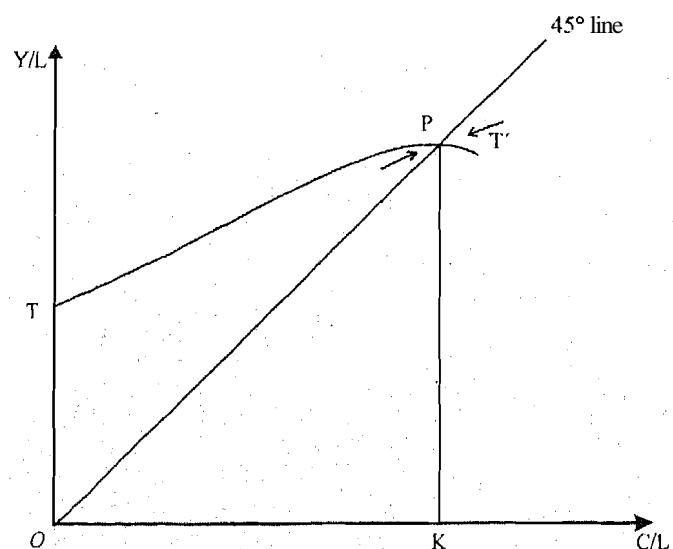


Fig. 4.1

The model operates under two stages:

- a) Constant working population and
- b) Expanding population

In the former, the proportionate growth rate of total real income will be the same as the proportionate growth rate of output per head. In the latter, the proportionate change in total real income is the sum of the proportionate change in output per head and the proportionate change in total working population.

a) Constant Working Population

For the operation of model, Kaldor postulates three functions

i) Saving Function

$$S_t = \alpha P_t + \beta(Y_t - P_t)$$

where $(1 > \alpha > \beta \geq 0)$

where P_t = profit in time period t , S_t = savings in time period t , Y_t = income in period t , α and β are MPS_s of profit and wage earning class in such a way that $1 > \alpha > \beta \geq 0$.

ii) Investment Function

$$K_t = \alpha' Y_{t-1} + \beta' (P_{t-1}/K_{t-1}) Y_{t-1}$$

and $I_t = K_{t+1} - K_t$

where K_t = stock of capital in times period t , Y_{t-1} = is the output of previous period, (P_{t-1}/K_{t-1}) = rate of profit on capital, α' and β' are the coefficients of output and rate of profit respectively in such a way that $\alpha' > 0$ and $\beta' > 0$.

iii) Technical Progress Function

$$(Y_{t+1} - Y_t) / Y_t = \alpha'' + \beta'' I_t / K_t$$

where $(Y_{t+1} - Y_t) / Y_t$ is the rate of growth of income, I_t / K_t = rate of net investment, α'' = coefficient of technical progress and β'' = capital per head C/L. Here $\alpha'' > 0$ but $1 > \beta'' > 0$.

Giving these three functions, the rate of growth of income, I_t / K_t = rate of growth of economy with constant population, can be shown with the help of following diagram in figure 2 where proportionate growth of capital $[(K_{t+1} - K_t) / K_t]$ is measured horizontally and the proportionate growth of income $(Y_{t+1} - Y_t) / Y_t$ vertically. Point G as determined by the technical progress function TT' and the 45° line is one of the steady growth points where proportionate growth of income equals proportionate growth of capital, starting from period t_1 where the growth of output G_1 is greater than growth of capital, i.e. C/O is less so investment will increase in the subsequent period so as to make capital equal to G_1 at A. This will, in turn, raise the growth of output in period t_2 to G_2 . The rate of investment will increase further to A, in period t_3 . So as to make A, equal to G_2 at point B. Similarly, the growth of output in subsequent periods will rise till point G is reached. This process will be reinforced by changes to the rate of profit on capital.

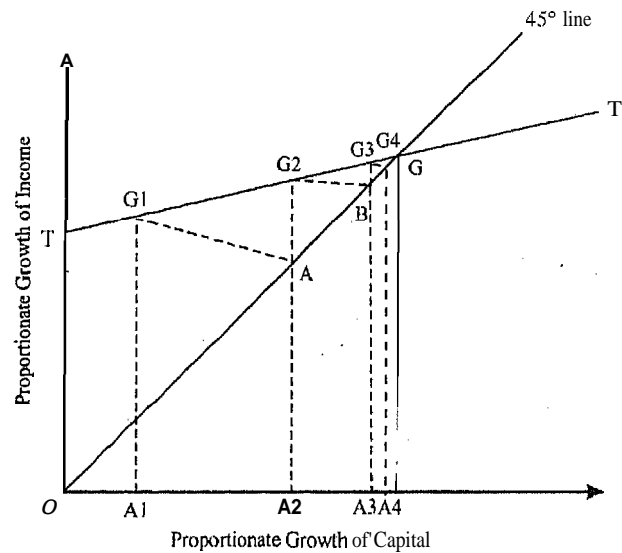


Fig. 4.2

b) Expanding Population

Leaving the assumption of constant working population, Kaldor studies the relation between growth in populations and growth in income. The relation of population growth with the growth in income is expressed by Kaldor, algebraically as under

$$I_t = g_t \quad (g_t \geq \lambda)$$

and $I_t = \lambda$

Where g is the percentage rate of growth of population, g_i is the percent rate of growth of income and λ is the maximum rate of population growth. If $g_i < \lambda$ and so is $L > h$, the rates of growth of income and population will continue to

rise till the growth rate of population equals λ . This relation between population growth and income growth is represented in the figure 3 where proportionate rate of growth of income is measured horizontally and proportionate rate of growth of populations is measured vertically. OH is the growth path of income. $PL\lambda$ is the curve of the growth rate of population. As the growth rate of income increases the growth rate of population also rises till the h curve becomes horizontal at a level where the rate of growth of income (OY) exceeds the former as at point E . In the long run population would grow at its maximum rate indicated by Lh portion of the dotted population growth rate curve. This assumes that the shape and position of the technical progress function, as given by the coefficient α'' and β'' in the equations (3) are not affected by the changes in population.

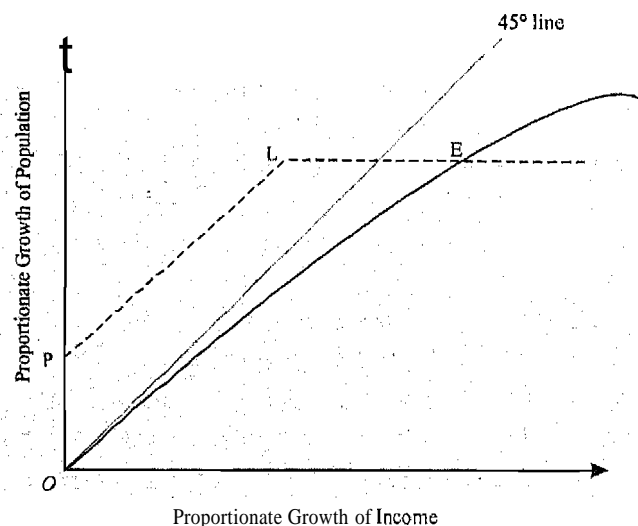


Fig. 4.3

But in a developing economy with a low capacity to absorb technical changes due to the scarcity of land and capital, the technical progress function will be lowered with the increase in growth rate of population. In this situation the technical progress function will cut the x-axis positively as at A in the figure 4. This implies that in order to maintain output per head at a constant level, a certain percentage growth in capital per head will be required. We have therefore two points of intersection P' and P of the technical progress function. Point P' is unstable equilibrium and point P of stable long run equilibrium. If the rates of growth of income and capital continuously diminish in the economy, both the output per head and capital per head may cease to grow. This may happen if the economy is to the left of point P'. If this situation persists, the technical progress function TT' may slip down as the dotted curve in any long run equilibrium. Rather, there may be stagnation in the economy.

The conclusion emerges from this analysis that the growth in population will lead to long-run equilibrium growth in income depending upon

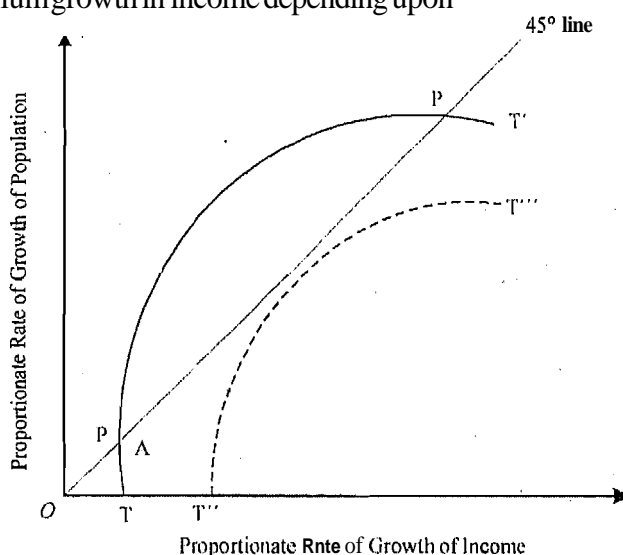


Fig. 4.4

the relative strength of the following two factors.

- 3 The maximum rate of population increase λ , and
- ii) The rate of technical progress, which causes a certain percentage increase in productivity, α in equation (3) above, when both population and capital per head are held constant

4.4.3 A Critical Appraisal

Kaldor's Model is based on the Keynesian tools of analysis and follows Harrod's dynamic approach regarding the rates of change in income and capital as the dependent variables of the system. But his model is quite different from the Harrodian and other models. In Kaldor's own words, "the ultimate causal factor was not savings or capital accumulation but, 'technical dynamism' – the flow of new ideas and the readiness of the system to absorb them".

- i) It explains the steady-path of the growth rather than steady state.
- ii) The division of the model into two stages – constant population and expanding population – is an attempt to reconcile the Harrodian warranted and natural rates of growth by demonstrating the long-run tendency for the two to converge by mutual interaction. The expanding population version of the model is particularly useful in demonstrating the effect of population growth on the growth of income in developing countries.

- iii) Kaldor's technical progress function is an improvement over the usual production function. As the former relates the technical progress to growth of productivity and capital accumulation while latter relates output per head to capital per head.

Despite these virtues of the Kaldor Model, it is not free from certain weaknesses.

- a) Kaldor's Model does not explain the determination of the rate of growth of the economy, as has been explained in the Harrod-Domar Models in terms of the volume of investment, saving income ratio and the capital-output ratio.
- b) Unlike the Harrod-Domar Model, this model does not give the reason for stability or instability in the economic system. Rather it analyses, certain features of the growth process which emphasise convergence and stability.

These drawbacks, however, do not detract one from the advances made by Kaldor in growth theory through this model.

4.5 PASINETTI'S THEORY OF GROWTH AND DISTRIBUTION

Pasinetti gave a more logical reconsideration of the theoretical framework provided by Cambridge economists where they have written to correct rate of profit and distribution to the rate of economic growth. Pasinetti gave a proof that the model, as originally formulated can not be maintained to achieve full employment so he modified the model and came to some general conclusions.

He criticised that for any given rate of population growth and of (Neutral) technical progress (neutral technical progress is discussed in the following unit in detail) there is only one saving ratio that keeps the system in equilibrium. According to him, "in any type of society, when any individual saves part of the income, he must also be allowed to own it, other wise he would not save at all". This means that the stock of capital which exists in the system is owned by those people (capitalists or workers) who in the past made the corresponding savings. So he divided total profits into two categories i.e. profits which accrue to the capitalists and profits which accrue to the workers. The latter comes as a part of the stock of capital that workers have saved and thus owned directly or through loans to capitalists, for which they will receive a share of total profits.

This distinction in the theory was missing that Pasinetti corrected and reformulated the model given by Kaldor. According to him, 'by attributing all profits to the capitalists it in advertently but necessarily imply that workers savings are all totally transferred as a gift to the capitalists clearly sounds as an absurdity.'

4.5.1 Reformulating the Kaldorian Model

While reformulating the model given by Kaldor, he added a identity:

$$P \equiv P_c + P_w$$

Where P_c and P_w stand for profits, which accrue to the capitalists and profits, which accrue to the workers; the saving functions now becomes $S_w = S_w(W + P_w)$ and $S_c = S_c P_c$; and the equilibrium condition becomes:

$$I = S_w(W + P_w) + S_c P_c = S_w \\ Y + (S_c - S_w) P_c \text{ (Where } Y \equiv W + P)$$

from which, we can obtain that there is distribution of income between wages and profits:

$$P_c / Y = 1 / (S_c - S_w) \cdot I / Y - S_w / (S_c - S_w) \quad \dots (1)$$

and corresponding to this, rate of profit remains given equilibrium condition, $I = S$

$$P_c / K = 1 / (S_c - S_w) \cdot I / K - S_w / (S_c - S_w) \cdot Y / K \quad \dots (2)$$

the expressions used so far do not refer to total profits. They only refer to that part of profits which accrue to the capitalists. Let us examine the implications.

As far as the distribution theory is concerned, equation (1) still retains a definite, but restricted, meaning. It now only expresses the distribution of income between capitalists and workers. The distribution of income between profits and wages is something different, and to obtain it, one must add the share of workers' profit into income (P_w / Y) to both sides of equation (1). Passinetti maintains that, as to the theory of the rate of profit, the consequences of our reformulation are even more serious. Expression (2) simply represents the ratio of a part of profits (P_c) to total capital, but this concept has no useful or interesting meaning. He argued that the expression which is really needed, is one for the ratio of total profits to total capital (rate of profit), and to obtain it, we must again add a ratio (P_w / K) to both sides of equation (2). In other words, we have to find suitable expressions for:

$$P / Y = P_c / Y + P_w / Y \quad \dots (3)$$

$$\text{and } P / K = P_c / K + P_w / K$$

Let us start with the latter equation. We know P_c / K already from (2). Thus, writing K_w for the amount of capital that the workers own indirectly – through loans to the capitalists – and i for the rate of interest on these loans, we obtain:

$$P / K = 1 / S_c - S_w \cdot I / K - S_w / S_c - S_w \cdot Y / K + i K_w / K.$$

An expression for K_w / K can easily be found. In dynamic equilibrium:

$$K_w / K = S_w / S = S_w (Y - P_c) / I = S_w S_c / S_c - S_w \cdot Y / I - S_w / S_c - S_w,$$

which, after substitution into the previous expression, finally gives us:

$$P / K = 1 / S_c - S_w \cdot I / K - S_w / S_c - S_w \cdot Y / K + i (S_w S_c / S_c - S_w \cdot Y / I - S_w / S_c - S_w) \quad \dots (4)$$

By exactly following the same procedure, the expression for equation (3) comes out as:

$$P / Y = 1 / S_c - S_w \cdot I / Y - S_w / S_c - S_w + i (S_w S_c / S_c - S_w \cdot K / I - S_w / S_c - S_w \cdot K / Y) \quad \dots (5)$$

These are the two general equations that Pasinetti gave. These equations contain all the elements which are necessary to correct the post-Keynesian theory of income distribution and of the rate of profit. Equations expressing the rate of profit, must be replaced by equation (4) and equation (3) for the distribution of income between workers and capitalists, and equation (5) for the distribution of income between wages and profits.

4.5.2 Rate and Share of Profits in Relation to the Rate of Growth

Pasinetti maintained that the most immediate consequence of the reformulation which has just been carried out is that, in order to say anything about share and rate of profits, one needs first a theory of the rate of interest. In a long-run equilibrium model, He argued that the obvious hypothesis to make is that of a rate of interest equal to the rate of profit. If we do make such a hypothesis, equations (4) and (5) become very simple indeed. By substitution P/K for i , equation (4), we get:

$$\begin{aligned} P/K [1 - (S_w S_c / S_c - S_w \cdot Y/I) + \\ (S_w / S_c - S_w)] &= I / S_c - S_w \cdot I / K - S_w / S_c - S_w \cdot Y / K, \\ P/K (S_c (I - S_w \cdot Y) / I) &= I - S_w \cdot Y / K. \end{aligned}$$

hence, provided that:

$$I - S_w Y \neq 0, \quad \dots (6)$$

(otherwise the ratio P/K would be indeterminate) the whole expression simply becomes:

$$P/K = (I / S_c) \cdot (I / K) \quad \dots (7)$$

And by an analogous process, equation (5) reduces to :

$$P/Y = I / S_c \cdot I / Y \quad \dots (8)$$

According to Pasinetti, in this reformulation unlike earlier models, we do not have to formally making any assumption whatsoever on the propensities to save of the workers. This is, in fact, the most striking result of our analysis. It means that, in the long run, workers' propensity to save, though influencing the distribution of income between capitalists and workers – equation (3) – does not influence the distribution of income between profits and wages – equation (8). Nor does it have any influence whatsoever on the rate of profit – equation (7)

4.5.3 Fundamental Relation between Profits and Savings

Pasinetti had build his model on the institutional principle inherent in any production system where wages are distributed among the member of society in proportion to amount the labour they contribute and profit are distributed in proportion to the amount of capital they own. In other word it implies that in the long run profit will be distributed in proportion to the amount of savings that are contributed. It, however, does not matter how many categories of individuals we may consider, the ratio of profits (that each category receive) to the savings will always be the same for all categories or

$$P_w / S_w = P_c / S_c \quad \dots (9)$$

4.5.4 Implications of the Model

Pasinetti came to two conclusions based on the above model:

- 1) The irrelevance of workers propensity to save gives the model a much wider generality than was earlier believed. Since the rate of profit and income distribution between profits and wages are determine independently of S_w , there is no need of any hypothesis on the aggregate saving behaviour of the workers.

- 2) The relevance of capitalists propensity to save only one to appear in the final equation (7 and 8), uncovers the strategic importance of the whole system of the decisions to save of just one group of individual i.e. capitalists.

In other words, the relation between capitalists saving and capital accumulation depended on simplifying and drastic assumption about negligible savings by the workers. Pasinetti proves that the relation is valid independent of any of such assumptions. It is also valid what ever may be the saving behaviour of the workers.

4.5.5 Conditions of Stability

According to Pasinetti in a system where full employment investments are actually carried out and prices are flexible with respect to wages only condition for stability is when $S_c > 0$.

Check Your Progress 2

- 1) Give the assumptions of the Kaldorian model and give a critical appraisal of the model.

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- 2) Compare and Contrast the Kaldor model and the Pasinetti model.

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4.6 LET US SUM UP

This unit discussed certain theories of growth and distribution put forward by a group of economists associated with Cambridge University, England. These theories jointly provide an approach to the study of economic growth where economic growth is analysed along with income distribution, particularly among the different factors of production, mainly labour and capital. The theories also critique the neo-classical theory of saving and investment.

The unit discussed the theories of Joan Robinson, Michal Kalecki, Nicholas Kaldor, and Luigi Pasinetti. Although there are some broad similarities in the four theories, each is also a distinct model with its own characteristics.

Joan Robinson's theory is mainly a theory of capital accumulation and economic growth. Mrs. Robinson takes more or less the classical theory of value and distribution with the Keynesian theory of saving and investment. Joan Robinson considers a competitive capitalistic system with fixed coefficients. Her theory gives primacy to capital accumulation driven by the desire of capitalists to make profits; also, in her theory, capital accumulation and the profit rate influence, and are influenced by, each other. Mrs. Robinson's theory also attempts to look at the picture of employment arising in such a scenario and describes certain 'ages'.

For Michal Kalecki, the distinguishing feature of modern capitalism is the presence of monopolies. Monopolies have to be studied not only in the case of static resource allocation, but also dynamic growth processes. Kalecki provided a formulation of the degree of monopoly. He attempted to look at the share of labour and capital under such monopoly capitalism. He however, did not consider bilateral monopoly, that is, where the buyer is a monopsonist. He also did not consider monopoly in the labour market where labour is a local monopolist as trade unions.

Nicholas Kaldor was heavily influenced by the work of John Maynard Keynes. He provided a model reminiscent of Harrod's model but in Kaldor the engine of growth was not so much saving and accumulation but technical progress. Kaldor also gave some suggestions about technical change being endogenous. The following unit on technical change and the unit in Block 3 on endogenous growth use these ideas. Luigi Pasinetti gave a logical underpinning to the Cambridge ideas and gave a coherent theory that linked growth with income distribution. He also ironed out some of the flaws of the Kaldorian model.

4.7 KEY WORDS

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|-------------------------------|--|
| Degree of Monopoly | A measure proposed by Kalecki to look at strength of market power by a monopoly. |
| Golden Age Equilibrium | A state proposed by Joan Robinson where smooth steady growth takes place and the desired and possible rates of accumulation are equal. |

4.8 SOME USEFUL BOOKS

Meade J.E 1964. *A Neoclassical theory of Economic Growth*, London

Kaldor, N. 1956. "Alternative Theories of Distribution", *The Review of Economic Studies* vol. XXIII, No. 2, pp. 83-100

Kalecki M. (1971/1937): *Selected Essays on the Dynamics of the Capitalist Economy*, Cambridge University Press, Cambridge.

Pasinetti, L.L. (1980): *Growth and Income Distribution: Essays in Economic Theory*, Cambridge University Press, Cambridge.

Robinson, Joan (1962). *Essays in the Theory of Economic Growth*. Macmillan, London.

4.9 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Sub-section 4.2.3 and answer.
- 2) See Sub-section 4.2.4 and answer.
- 3) See Sub-section 4.3.1 and 4.3.2, and answer.

Check Your Progress 2

- 1) See Sub-sections 4.4.1 and 4.4.3 and answer.
- 2) See Section 4.4 and Sub-section 4.4.5 and answer.