# BASUDEV GODABARI DEGREE COLLEGE, KESAIBAHAL

## BLENDED LEARNING STUDY MATERIALS

## UNIT-II

**DEPARTMENT :-ECONOMICS**

**SUBJECT :-Development Economics-1**

**SEMESTER :-5th Semester**

# CONTENT

Europe. It assumed the existence of a rigid division of society between capitalists (including landlords) and labourers. It neglected the role of the middle class which provided the necessary impetus to economic growth. It did not occur to them that the major source of savings in an advanced society was the income receivers and not the property owners.

2. **Neglects Public Sector.** To the classicists, perfect competition and the institution of private property were the essential prerequisites for economic development. They, however, failed to realize the important role which the public sector has assumed in accelerating capital accumulation in recent years.

3. **Less Importance to Technology.** One of the important lacunae in the classical model is the part played by science and technology in development. Increase in productivity resulted from extra capital and increased division of labour. The great inventions of the Industrial Revolution were regarded as something discrete and unusual. Adam Smith realised the importance of improved technology in economic development. According to him, technology led to division of labour and the expansion of the market. It was, however, Ricardo who pointed out that improved technology in the industrial field led to the displacement of labour and other adverse consequences. In the beginning, technological progress might counteract the action of diminishing returns. But ultimately when the impact of technological progress was exhausted, diminishing returns set in and the economy moved towards the stationary state. The classicists failed to visualize the important impact that science and technology had on the rapid economic development of the now developed nations.

4. **Unrealistic Laws.** The pessimistic view of the classical economists like Ricardo and Malthus that "the end result of capitalist development is stagnation" was based on two assumptions: application of diminishing returns to land and the Malthusian theory of population. Rapid increase of farm produce in the advanced nations has proved that the classicists under-estimated the potentialities of technological progress in counteracting diminishing returns to land. Similarly, the Malthusian theory of population has been disproved by population trends prevailing in the Western World. Diametrically opposed to the Malthusian principle, population has not grown so fast as to outstrip the food supply. On the other hand, agricultural productivity has been much faster than the population growth.

5. **Wrong Nations about Wages and Profits.** Wages have not tended to be at the subsistence level. There has been a continuous increase in money wages without a corresponding decline in profit rates. And the mature economies have not reached the stage of economic stagnation. Both Ricardo and Malthus have been scoffed at as false prophets in the light of the economic development of the Western World.

6. **Unrealistic Growth Process.** The classical model assumed a stationary state in which there was change, but around a point of equilibrium; there was progress, but steady and continuous like a tree. This is, however, not a satisfactory explanation of the process economic growth. For economic growth, as it is understood today, does not proceed steadily and continuously, but by 'fits and starts'.[3]

[3]For its Applicability to Underdeveloped Countries refer to the Smithian and Ricardian models under this head.





**Mathematical Note**

In the classical model, the economy's total output or income $Y$ depends upon its capital stock $K$, the size of its labour force $L$, the level of technology $T$ and the amount of land available $N$. It means that $Y$ is a function $F$ of $K, L, T$ and $N$ which can be written in the form of a production function.

$$Y=F(K, L, T, N) \quad \ldots(1)$$

The level of technique $T$ is a function of the level of investment $I$, *i.e.*,

$$T=F(I) \quad \ldots(2)$$

Since capitalists make investments in expectations of profits, therefore, investment is a function of profits, *i.e.*,

$$I=F(R) \quad \ldots(3)$$

where $I$ is net investment and $R$ is the rate of profit on land and capital.

The rate of profit $R$, itself is a function of population growth $L$, and the level of technology $T$,

$$R=F(L, T) \quad \ldots(4)$$

According to the classical economists, with the increase in population, diminishing returns on land would necessitate the use of more labour, thus raising labour costs and reducing profits. This can be offset only by introducing improved technology.

The size of the labour force is a function of the size of wages fund $W$, *i.e.*,

$$L=F(W) \quad \ldots(5)$$

The size of the wages fund is a function of the volume of net investment $I$. Since net savings find their way automatically into investment, the wage fund tends to increase with an increase in net investment,

$$W=F(I) \quad \ldots(6)$$

Lastly, in the classical model total income equals total profits plus total wages,

$$Y=R+W \quad \ldots(7)$$

So we have seven equations and seven unknowns and the classical model is determinate.

By differentiating production function (1), we get the growth rate of the flow of national income at time $t$,

$$\frac{dy}{dt}=\frac{\partial F}{\partial K}\cdot\frac{dK}{dt}+\frac{\partial F}{\partial L}\cdot\frac{dL}{dt}+\frac{\partial F}{\partial T}\cdot\frac{dT}{dt}+\frac{\partial F}{\partial N}\cdot\frac{dN}{dt}$$

where $\partial F/\partial K$, $\partial F/\partial L$, $\partial F/\partial T$, $\partial F/\partial N$ represent the marginal productivity of $K$, $L$, $T$ and $N$ respectively and $dK/dt$, $dL/dt$, $dT/dt$ and $dN/dt$ express capital accumulation, increase in the labour force, technological progress and increase in the amount of land at time $t$.

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# The Marxian Theory of Economic Development

## INTRODUCTION

KARL MARX, the celebrated author of 'Das Kapital', is one of the few celebrities in history who cast a spell on hundreds of millions of people by their doctrines. He has been epitomized as 'Marx the Prophet' and is ranked with Christ and Mohammad if we are to judge him by the number of his followers. As Schumpeter wrote: Marxism is a religion. To the orthodox Marxist, as any believer in a Faith, the opponent is not merely in error but in sin."[1] Marx predicted the inevitable doom of capitalism and it was on this prediction that communism has built its edifice. The Marxian analysis is the gravest and the most penetrating examination of the process of capitalist development. It has had the greatest influence in shaping policies in the Soviet Union, China and other communist countries. Our purpose here is to examine the Marxian process of economic development and not the Marxist system as whole.

## THE MARXIAN MODEL

"Marx contributed to the theory of economic development in three respects, namely in broad respect of providing an economic interpretation of history, in the narrower respect of specifying the motivating forces of capitalist development, and in the final respect of suggesting an alternative path of planned economic development."

**Materialistic Interpretation of History.** The materialistic interpretation of history attempts to show that all historical events are the result of a continuous economic struggle between different classes and groups in society. The main cause of this struggle is the conflict between 'the mode of production' and 'the relations of production'. The mode of production refers to a particular arrangement of production in a society that determines the entire social, political and religious way of living. *The relations of production* relate to the class structure of a society "uniquely characterised" by the following components:

(*i*) the organisation of labour in a scheme of division and co-operation, the skills of labour, and the status of labour in the social context with respect to degrees of freedom or servitude;

(*ii*) the geographical environment and the knowledge of the use of resources and materials; and

[1] J.A. Schumpeter, *Ten Great Economists*, p. 5 and foot note.



(*iii*) technical means and processes and the state of science generally.[2]

According to Marx, every society's class structure consists of the *propertied* and the *non-propertied* classes. Since the mode of production is subject to change, a stage comes in the evolution of a society when the forces of production come into clash with the society's class structure. The existing property relations "turn into fetters" on the forces of production. Then comes the period of 'social revolution'. This leads to the class struggle—the struggle between the haves and the have-nots—which ultimately overthrows the whole social system. But to Marx, "no social order ever disappears before all the productive forces, for which there is room in it, have been developed, and new higher relations of production never appear before the material conditions of their existence have matured in the womb of the old society."[3]

**Surplus Value.** Marx uses his theory of surplus value as the economic basis of the 'class struggle' under capitalism and it is on the basis of his theory of surplus value that he builds the superstructure of his analysis of economic development. Class struggle is simply the outcome of accumulation of surplus value in the hands of a few capitalists. Capitalism, according to Marx, is divided into two great protagonists: the workers who sell their 'labour-power' and the capitalists who own 'the means of production'. Labour power is like any other commodity. The labourer sells his labour for what it is worth in the labour market, *viz.*, for its value. And its value, like the value of any other commodity, is the amount of labour that it takes to produce labour-power. In other words, the value of labour-power is the value of the means of subsistence necessary for the maintenance of the labourer, which is determined by the number of hours necessary for its production. According to Marx, the value of the commodities necessary for the subsistence of the labour is never equal to the value of the produce of that labour. If a labourer works for a ten-hour day, but it takes him six hours' labour to produce goods to cover his subsistence, he will be paid wages equal to six hours' labour. The difference worth 4 hours' labour goes into the capitalist's pocket in the form of net profits, rent and interest. Marx calls this unpaid work "surplus value". The extra labour that a labourer puts in and for which he receives nothing, Marx calls "surplus labour".

**Capital Accumulation.** According to Marx, it is surplus labour that leads to capital accumulation. This supererogatory labour simply augments the capitalist's profits. The capitalist's main motive is to increase the surplus value which goes to swell his profits. He tries to maximize his profits in three ways:

(1) by prolonging the working day in order to increase the working hours of surplus labour. If the working hours are extended from ten to twelve, the surplus will automatically increase from four to six;

(2) by diminishing the number of hours required to produce the labourer's sustenance. If they were reduced from six to four, the surplus would again rise from four to six. It also tantamounts to a reduction in the subsistence wage;

(3) by 'the speeding up of labour', *i.e.*, increasing the productivity of labour. This requires a technological change that helps in raising the total output and lowering the cost of production.

[2] M.M. Bober, *Karl Marx's Interpretation of History*, p. 24.
[3] E. Burns, *A Handbook of Marxism*, p 257.

Of the three methods, according to Marx, increase in the productivity of labour is the likely choice of the capitalists, since the other two methods, extending the working hours and education of wages, have limitations of their own. So in order to make improvements in the productivity of labour, capitalists save the surplus value, reinvest it in acquiring a large stock of capital and thus accumulate capital. "Accumulate, accumulate ! That is Moses and the Prophets", and "Save, save, *i.e.*, reconvert the greatest possible portion of surplus value or surplus product into capital." These are the capitalist's methods.

Profits are determined by the amount of capital. As Marx says, "Capital is dead labour that vampire like only lives by sucking living labour and lives the more, the more labour it sucks". To explain the origin of profit and to analyse the relation between wages and profits, Marx separates capital into constant capital and variable capital. Capital invested in stocks or raw materials, equipment which directly assists the productivity of labour, Marx calls *constant capital* (c). Capital devoted to the purchase of labour power in the form of wages or direct subsistence, he terms *variable capital* (v). The surplus value is denoted by s. So the total value of product = constant capital (c) + variable capital (v) + surplus value (s), or (c+v)+s. The ratio of constant to variable capital c/v, is termed as the *organic composition of capital*. The rate of surplus value is defined as the ratio of surplus value to variable capital or of profits to wages. This is known as the degree or rate of exploitation. This leads Marx to point out that the rate of profit is not dependent solely on the rate of surplus value. The rate of profit (r) can change even though the rate of surplus value (s/v) remains constant, if a change occurs in the organic composition of capital (c/v). The influence of technical progress is to alter the organic composition of capital, generally (though not invariably) in the direction of raising the ratio of constant to variable capital. Hence the tendency of industrial progress is to lower the rate of profit r—even though there is no decrease in the rate of surplus value.[4]

One of the consequences of capital accumulation is the *concentration* of capital in gigantic enterprises. Competition among capitalists forces them to cheapen their products. This can be done by introducing labour-saving machines which increase labour productivity. Those capitalists who are unable to replace labour by machines are 'squeezed out' and their enterprises are taken over by big capitalists.

Capital accumulation and concentration involve increase in constant capital and decline in variable capital. The rapid growth of constant capital as compared with variable capital leads to a relative decrease in the demand for labour. This process of supplanting labour by machines creates an *industrial reserve army* which increases as capitalism develops. "But the greater this reserve army in proportion to the active labour army, the greater is the mass of a consolidated surplus population, whose misery is in inverse ratio to its torment of labour.... This is the absolute general law of capitalist accumulation."[5] The larger the industrial reserve army, the worse are the conditions of the employed workers, since the capitalist can dismiss dissatisfied and troublesome workers, being able to replace them from the ranks of the reserve army. Capitalists are also able to

[4]Maurice Dobb, *Political Economy and Capitalism*, pp. 96-97.
[5]K. Marx, op. cit., p. 707.





cut down wages to a semi-starvation level and appropriate more and more surplus value. This is the *law of the increasing misery of the masses* under capitalism.

But when the capitalist is replacing the workers by machines, he is killing the goose that laid the golden eggs. There is a continual reduction of the surplus value. Marx believes that technological progress tends to increase the organic composition of capital (c/v). Since the rate of profits is inversely related to the organic composition of capital, the former tends to decline with accumulation. Marx explained this tendency of falling rate of profit in terms of the following equation:

$$r = \frac{s}{c+v} = \frac{s/v}{1+c/v}$$

The rate of profit (r) varies inversely with the organic composition of capital (c/v) and directly with the rate of surplus values (rate of exploitation (s/v). Therefore the rate of profit 'r' rises with the rate of surplus value s/v and falls with the organic composition of capital c/v. Let us explain this law of falling tendency of the rate of profit in terms of Marx's example. Suppose the rate of surplus value s/v is 100 per cent, and the wages of workers are also 100 per week. Now, if

$c = 50$, $v = 100$, then $r = \frac{100}{150}$, or $66\frac{2}{3}\%$.
$c = 100$, $v = 100$, then $r = \frac{100}{200}$, or $50\%$.
$c = 200$, $v = 100$, then $r = \frac{100}{300}$, or $33\frac{1}{3}\%$
$c = 300$, $v = 100$, then $r = \frac{100}{400}$, or $25\%$.
$c = 400$, $v = 100$, then $r = \frac{100}{500}$, or $20\%$.

In this way, the same rate of surplus value, with the same degree of labour exploitation, would express itself in a falling rate of profit, because "as technical progress tends to substitute stored-up labour for living labour, the rate of profit yielded by a given rate of surplus value will fall, that is the rate of profit will fall *unless* the rate of exploitation of living labour is correspondingly increased."[6]

**Capitalist Crisis.** In order to counteract this tendency of declining rate of profits the capitalists increase the degree of exploitation by reducing wages, lengthening the working day, and by "speed ups", etc. But since every capitalist is engaged in introducing new labour-saving and cost-reducing devices, the ratio of labour (and hence surplus value) to total output falls still further. The rate of profit declines all the more. Production is no longer profitable. Consumption dwindles as machines displace men and the industrial reserve army expands. Bankruptcies ensue. Every capitalist tries to dump goods in the market and in the process small firms disappear. A capitalist crisis has begun. The ultimate cause of all economic crisis, Marx points out, is the poverty and limited purchasing power of the masses. Economic crisis appear in the form of an over production of commodities, acute difficulties in finding markets, a fall in prices and a sharp curtailment of production. During the crisis, unemployment increases sharply, the wages of workers are further cut, credit facilities breakdown and small employers are ruined.

This does not continue for ever. Revival soon starts. The low level of prices, cut in wages, elimination of speculative ventures and destruction of capital tend to raise the profit rate which eventually lead to new investments. As Marx

[6]M. Dobb, *On Economic Theory and Socialism*, p. 193.

wrote: 'A crisis always forms the starting point of large new investments. There fore, from the point of view of society as a whole, a crisis is, more or less, the new material basis for the next turnover cycle."[7] But it leads to the same catastrophic conclusion: competition for labour; higher wages; labour-saving machinery; a reduction in surplus value; decline in profit rate; still greater competition and collapse. This succession from crisis to depression, followed by recovery and boom and then again crisis, is evidence of the *cycle* character of the development of capitalist production.

In each period of crisis stronger capitalists expropriate the weaker capitalists and alongwith it grows the indignation of the working class. And then finally the Doomsday of capitalism arrives which is best described in Marx's own words: "Alongwith the constantly diminishing number of the magnates of capital, who usurp and monopolize advantages of this process of transformation, grows the mass of misery, oppression, slavery, degradation, exploitation; but with this too grows the revolt of the working classes, a class always increasing in numbers, and disciplined, united, organised by the very mechanism of the process of capitalist production itself. The monopoly of capital becomes a fetter upon the mode of production. . . .Centralization of the means of production and socialization of labour at last reach a point where they become incompatible with their capitalists integument. This integument is burst asunder. The knell of capitalist's private property sounds. The expropriators are expropriated."[8] This is the historical tendency of capitalists accumulation. In elaborating the general law of capitalist accumulation, Marx provides the economic explanation of the necessity and inevitability of the revolutionary transformation from capitalist to socialist society. Capitalism leads to the proletarian revolution whereby the "dictatorship of the proletariat" is established. Poverty will disappear. The State will "wither away" and each individual will contribute to national income according to his abilities and receive according to his needs. Socialism replaces capitalism.

### A Critical Appraisal

Marx's theory of capitalist development has been accepted by his followers as a gospel truth while it has been severely criticised by his opponents for the following reasons:

1. **Surplus Value Unrealistic.** The whole Marxian analysis is built on the theory of surplus value. However in the real world, we are concerned not with *values* but with real tangible prices. Thus Marx has created an abstract and unreal *value world* which has made it difficult and cumbersome to understand the working of capitalism.

2. **Marx—*A False Prophet*.** Marx has proved to be a false prophet. No doubt socialist societies have come into existence but their evolution has not been on the lines laid down by Marx. The countries which have toed the Marxian line of thinking have been curiously those in which capitalist development lagged behind. All the communist States had been poor and are even now so, as compared to the capitalist countries. There is no increasing misery of

[7] K. Marx, *op. cit.*, p. 186.
[8] *Ibid.*, pp. 836-837.





labour in advanced capitalist societies as asserted by Marx. On the contrary, real wages of workers have continued to rise. The workers have tended to become more prosperous with capitalist development. And the middle class instead of disappearing has emerged as a dominant class. There have been also no signs of the 'withering away' of the State in these countries.

3. **Technological Progress Helpful in Increasing Employment.** Marx pointed out that with increasing technological progress, the industrial reserve army expands. But this is an exaggerated view, for the long run effect of technological progress is to create more employment opportunities by raising aggregate demand and income.

4. **Falling Tendency of Profits not Correct.** According to Joan Robinson, Marx's "explanation of the falling tendency of profits explains nothing at all." Marx contends that as development proceeds, there is an increase in the organic composition of capital which brings about a decline in the profit rate. But Marx failed to visualize that technological innovations can be capital-saving too, and that with a fall in capital-output ratios and increases in productivity and total output, profits can rise along with wages.

5. **Marx could not understand Flexibility in Capitalism.** Marx also did not foresee the emergence of political democracy as the protector and the preserver of capitalism. Democracy as a political system has proved its resilience and adaptability to the changing times. The introduction of social security measures, antitrust laws and the mixed economies have given a lie to the Marxian prediction that capitalism contains within itself the seeds of its own destruction.

6. **His Cyclical Theory is Wrong.** Marx was the first among the earlier economists who regarded the 'cycle' as an integral part of his analytical framework. He emphasized that capital accumulation led to a reduction in the demand for consumption goods and fall in profits. But he failed to realise that with economic development the share of wages in aggregate income need not fall, nor the demand for consumer goods. His model, though it sought to explain a dynamic process, was, in the words of Schumpeter, "unsuited for it, its two main props being (*a*) labour theory of value, and (*b*) a modified version of subsistence theory of wages. Marx was analysing the problem of growth with the help of tools which were essentially suited to static economic analysis."

**Conclusion.** "Despite Marx's theoretical misdemeanours, faulty or even unscientific analysis, he was also", according to Schumpeter, "the first to visualize what even at the present time is still the economic theory of the future for which we are solely and laboriously accumulating stone and mortar, statistical facts and functional equations." Some of the Marxian tools pertaining to the theory of economic development have ever since become part and parcel of the theory of economic growth. Technological progress and innovations are the main stay of any theory of economic development. Similarly, capital accumulation is the fundamental idea behind economic growth. Profits are still regarded as both the hallmark of capitalist development and its Achilles' heel. Marx showed that economic development does not follow a smooth course but comes about in "fits and starts". Business cycles are inevitable. He pointed out that a state of under-consumption was the main cause of depression and that for stable growth a proper balance between investment and consumption was essential. He also indi-

cated that too low or too high wages in relation to total output can adverse affect investment and thus stifle economic growth. Industrial unemployment is also one of the major variables in his system. Thus Marx was in a way Keynes precursor.

To conclude in the words of Meier and Baldwin: "As a formal model Marxian economics is weak. The 'internal contradictions' are more those of the Marxian system itself than they are of capitalism, which the system purportedly analyses...Nevertheless, no anti-Marxist heed deny that Marx contributes some important insights in his study of developmet....And, in spite of all its fallacies and invalid conclusions, Marxism must be understood. For it still remains an appealing political religion challenging the future of poor and rich countries alike."[9] But it fails as a logically sound theory of economic development.

### The Marxian Model and Underdeveloped Countries

The Marxian model is not applicable directly to underdeveloped countries. Marx did not think of the problems of such countries "Apart from a few illusions remarkable for their determinant note with regard to obtaining prospects for economic development in regions like Western Asia or India no special attention is given to the problems of change in underdeveloped countries."[10] Marx was mainly concerned with the problems connected with the develoment of capitalism in the Western World. Colonies were regarded as one of the "highest stages" in capitalist development. Foreign domination was regarded as the principal cause of economic backwardness of the colonies. The only obvious remedy was their political freedom.

Marx's failure to recognize the existence of population pressures makes his model inapplicable to overpopulated underdeveloped countries. But some of the variables of his analysis do exist in such economies. In underdeveloped countries till recently under the colonial rule, labour was being exploited for the benefit of the 'home country'. There was the concentration of capital in the hands of a few capitalists. Even now in almost all the underdeveloped countries that are also politically free, wages are near subsistence levels; the 'increasing misery' of the masses is visible; a 'reserve army' of the chronic and disguised unemployed exists; the problem of under-consumption is universal and the society is sharply divided between the 'two classes', the middle class being virtually non-existent.[11] The existence of such conditions can lead to 'class struggle' and the establishment of the 'dictatorship of the proletariat'. The recent political turmoils in some of the Latin American, African, the Middle and the Far Eastern countries have shown that the existence of Marxian 'conditions' in backward countries acts like nurseries where the communist seed grows soon. "Ironically, however, it is Marx's

[9] Meier and Baldwin, *op. cit.*, pp. 63-64.

[10] A. Bonne, *op. cit.*, p. 243.

[11] Only the Marxian terminology is applicable. For underconsumption implies an abundance of unmarketable goods due to over-production in the Marxian analysis while in the case of underdeveloped countries it refers to low level of consumption due to low level of production. Similarly the existence of a surplus reserve army of workers in the Marxian model is the result of the introduction of labour-saving devices, whereas in underdeveloped countries unemployment is disguised and rural, not industrial, the result of the growth in numbers rather than the use of industrial technology.





perception of planned development expressed in his minor writings which presumably has had a greater impact on the actual economic development of countries such as the Soviet Russia and Mainland China. Marx's notion of planned development also seems to appeal to those backward countries which are in a great hurry to industrialize at the risk of excessive national "belt-tightening."

# 10

## The Schumpeterian Theory

JOSEPH Alois Schumpeter first presented his theory of economic growth in the *Theory of Economic Development* published in German in 1911 (its English edition appeared in 1934) which was elaborated and refined but in no way altered in any essential respect in *Business Cycles* (1939) *and Capitalism, Socialism and Democracy* (1942).

**Meaning of Economic Development**. To start with, Schumpeter assumes a perfectly competitive economy which is in stationary equilibrium. In such a stationary state, there is perfect competitive equilibrium: no profits, no interest rates, no savings, no investments and no involuntary unemployment. This equilibrium is characterised by what Schumpeter terms—the "circular flow" which continues to repeat itself in the same manner year after year—similar to the circulation of the blood in an animal organism. According to Schumpeter, "The circular flow is a stream that is fed from the continually flowing springs of labour-power and land, and flows in every economic period into the reservoirs which we call income, in order to be transformed into the satisfaction of wants." Development according to him, "is spontaneous and discontinuous change in the channels of the *circular* flow, disturbance of equilibrium, which for ever alters and displaces the equilibrium state previously existing."[1] These 'spontaneous and discontinuous' changes in economic life are not forced upon it from without but arise by its own initiative from within the economy and appear in the sphere of industrial and commercial life. Development consists in the carrying out of new combinations for which possibilities exist in the stationary state. New combinations come about in the form of innovations.

**Innovations**. An innovation may consist of: (1) the introduction of a new good; (2) introduction of a new method of production; (2) the opening up of a new market; (4) the conquest of a new source of supply of raw materials or semi-manufactured goods; (5) the carrying out of the new organization of any industry, like the creation of a monopoly.

**Role of Innovator**. Schumpeter assigns the role of an innovator not to the capitalist but to the entrepreneur. The *entrepreneur* is not a man of ordinary managerial ability, but one who introduces something entirely new. He does not provide funds but directs their use. The entrepreneur is motivated by (*a*) the desire to found a private commercial kingdom, (*b*) the will to conquer and prove his superiority; and (*c*) the joy of creating, of getting things done, or simply of exercising one's energy and ingenuity. His nature and activities depend on his socio-cultural environment. To perform his economic function the entrepreneur

[1]J.A. Schumpeter, *Theory of Economic Development*, p. 64. Italics mine.

Bepin Behari Naik. 30/9/





requires two things: first, the existence of technical knowledge in order to produce new products; second, the power of disposal over the factors of production in the form of credit. According to Schumpeter, a reservoir of untapped technical knowledge exists which he can make use of. Therefore, credit is essential for development to start. "To summarise, the rate of an economy's development is a function of the change in the society's fund of applied technical knowledge. The rate of improvements in the techniques of production depends upon the level of entrepreneurial activity, which is governed by the rate of emergence of new entrepreneurs and the creation of credit."

**Capital Profit and Interest**. *Capital* is regarded by Schumpeter as "nothing but the level by which the entrepreneur subjects to his control the concrete goods which he needs, nothing but a means of diverting the factors of production to new uses, or of dictating a new direction to production." He defines it as "the sum of means of payment which is available at any moment for transference of entrepreneurs." The entrepreneurial *profit* is conceived of "as a surplus over costs: a difference between the total receipts and outlay—*as a* function of innovation." Like capital and profit, *interest* is also regarded as a product of development by Schumpeter. It "is a premium on present over future consumption." But it is not, like profit for example, a direct fruit of development in the sense of a prize for its achievements. It is, on the contrary rather a brake...on development, a kind of tax on entrepreneurial profit."

**Critical Process**. Schumpeter's model starts with the breaking up of the circular flow with an innovation by an entrepreneur for the purpose of earning profit. In order to break the circular flow, the innovating entrepreneurs are financed by *bank credit* expansion. Since investment in innovations is risky, they must pay interest on it. Once the new innovation becomes successful and profitable, other entrepreneurs follow it in "swarm-like clusters." Innovation in one field may induce other innovations in related fields. The emergence of a motor car industry may in turn stimulate a wave of new investments in the construction of highways, rubber tyres and petroleum products, etc.

**Cyclical Process**. Since investment is assumed to be financed by creation of bank credit, it increases money incomes and prices and helps to create a cumulative expansion throughout the economy. With the increase in the purchasing power of the consumers, the demand for the products of the old industries increases in relation to supply. Prices rise, profits increase and old industries expand by borrowing from the banks. It induces a secondary wave of credit inflation which is superimposed on the primary waves of innovation. Over-optimism and speculation add further to the boom. After a period of gestation the new products start appearing in the market displacing the old products and enforcing a process of liquidation, re-adjustment and absorption[2]. The demand for the old products is decreased. Their prices fall. The old firms contract output and some are even forced to run into liquidation. As the innovators start repaying bank loans out of profits, quantity of money is decreased and prices tend to fall. Profits decline. Uncertainty and risks increase, the impulse for innovation is reduced and eventually comes to an end. Depression ensues and the painful

[2]J.A. Schumpeter, 'The Analysis of Economic Change' in *Readings in Business Cycle Theories*, pp. 8-9.

process of re-adjustment to the "point of previous neighbourhood of equilibr
starts. Ultimately the natural forces of recovery bring about a revival. Once a
equilibrium is restored. Then some enterprising entrepreneurs begin with a
set of innovations, others follow, and a new boom begins. In fine, entrepre
are the key figures in the Schumpeterian analysis. They bring about cont
development in spontaneous and discontinuous manner. And "cyclical sw
are the cost of economic development under capitalism," a permanent featu
its dynamic time-path.

Secularly, continued technological progress will result in an unbound
increase in total and per capita output, since historically there are no dimi
ing returns to technological progress. As long as technological progress ta
place, the rate of profit will be positive. Hence there can be no drying up
sources of investible funds nor any vanishing of investment opportunities. "Th
is therefore no *a priori* ceiling to the level of per capita income in a capital
society. Nonetheless, the economic success of capitalism will eventually lead
its decay. For the very process of capitalist development weakens the institutio
and values basic to its own survival"[3]. "Can capitalism survive ? No, I do n
think it can," wrote Schumpeter, as his final appraisal of the future of capitali
To him, the very success of capitalism "undermines the social institutions wh
protect it, and 'inevitably' creates conditions in which it will not be able to li
and which strongly point to socialism as the heir-apparent.[4]"

**Process of the End of Capitalism.** According to Schumpeter, capitalism c
maintain itself only so long as entrepreneurs behave like knights and pionee
But such daring innovators are being destroyed by the capitalist system it
which rests on a rational attitude. This enquiring, sceptical and rational attit
permeates the entire capitalist society. As a result, *three* forces are discerni
that are the beginning of the creeping death of capitalism. They are: (1) t
decadence of the entrepreneurial function; (2) the disintegration of the bourge
family; and (3) the destruction of the institutional framework of the capital
society.

In the early stages of capitalism, the driving force came from entrepren
who dared to innovate, to experiment, and to expand. But now innovation
reduced to a routine. Technological progress has become the business of tea
of trained specialists. The new 'lords' of business are the managers, depersonali
owners and private bureaucrats. This reduces the industrial bourgeoisie to
class of wage-earners and thus undermines the function and the position of t
entrepreneur as the "warrior knight."

There is also the destruction of the *bourgeoisie* family. Parents adop
rationalistic attitude in their behaviour towards children. The traditional fam
idea is weakened. The desire to found a "private kingdom", a "dynasty" is
longer there. The will to accumulate wealth gradually disappears and along w
it another important aspect of the capitalist society.

Finally, Schumpeter contends that the entrepreneur also tends to destr
the institutional framework of the capitalist society. The tendency towards co
centration into big concerns weakens and destroys the twin institutions of priv

[3]J. Adelman, *Theories of Economic Growth and Development*, p. 108.
[4]J.A. Schumpeter, *Capitalism, Socialism and Democracy*, p. 61.





property and freedom of contract. In the case of big concerns, the proprietors are the small and large shareholders who are "dematerialized" and "defunctionalized" by the professional, salaried managers. The proprietors' role is performed by the latter while the former are totally divorced from active management. According to Schumpeter, it was rationality that had destroyed the royal power in the past. Now again, it is the rationalistic attitude of the ruling group towards domestic and international problems that will be the bane of capitalism. But all these forces are not enough to ring the death knell of capitalism. It is, however, the active hostility of the intellectuals which is bringing the 'day' nearer. The intellectuals sow seeds of doubt and discontentment in the minds of the masses against the social and political framework of the capitalist order. By inciting the white-collar groups and the labouring classes they are able to secure anti-capitalist political reforms. As a result, institutional framework upon which capitalism rests starts crumbling and there is a gradual movement towards socialism. Eventually capitalism would fade away without any bang or whimper.

**Schumpeter's Analysis and Underdeveloped Countries**

"Schumpeter's theory must be ranked as a major performance, one worthy of such great economists as Smith, Ricardo, Mill, Marx, Marshall and Keynes."[5] No doubt 'it is replete with the brilliant reasoning and insight of a great theorist', its applicability to underdeveloped countries is limited.

1. **Different Socio-Economic Order.** Schumpeter's theory corresponds to a particular socio-economic order that existed in Western Europe and America of the 18th and 19th centuries. In that period some of the prerequisites of growth already existed. In underdeveloped countries the socio-economic conditions are altogether different and the prerequisites for development in the form of economic and social overheads are non-existent.

2. **Lack of Entrepreneurship.** The Schumpeterian analysis depends upon the existence of an entrepreneurial class. However, in underdeveloped countries adequate entrepreneurship is lacking. In such economies there are low profit expectations and low state of technological which do not encourage innovational investments in new plant and equipment. Moreover, the lack of adequate power, transport, skilled personnel, etc. act as disincentives to entrepreneurial activity.

3. **Not Applicable to Socialist Countries.** Schumpeter's analysis is not applicable to the majority of underdeveloped countries which have socialist leanings. For example, the introduction of social security measures and high progressive income taxes are inimical to the development of an entrepreneurial class, because they tend to reduce profits.

4. **Not Applicable to Mixed Economies.** Moreover, Schumpeter's innovator is a private entrepreneur who does not fit in the present day mixed economies. In an underdeveloped country, government is the biggest entrepreneur. The main impetus for development comes from the public and the semi-public sectors. Thus Schumpeter's innovator has a limited role to play in an underdeveloped country.

[5]Meier and Baldwin, *op. cit.*, p. 95.

5. **Institutional changes and not Innovations Needed.** To start the dev ment process and to make it self-sustaining it is not innovation alone b combination of several factors like organizational structures, business prac skilled labour and appropriate values, attitudes and motivations which required.

6. **Assimilation of Innovations.** According to Henry Wallich, the develop process in underdeveloped countries is based, not on innovation, but on assimilation of existing innovation. For, entrepreneurs in underdevelo countries are not in position to innovate. Rather, they adopt innovations tak place in advanced countries.

7. **Neglects Consumption.** The Schumpeterian process is 'production-orient while the development process is 'consumption-oriented'. This appraisal is appl in the current trend towards the welfare state in which demand and consumpt play a leading role.[6]

8. **Neglects Savings.** Schumpeter's exclusive emphasis on bank credit d cures the role of real savings in investment. It also undermines the importa of deficit financing, budgetary savings, public credit and other fiscal measures economic development.

9. **Neglects External Effects.** According to Schumpeter, development is result of changes that arise from within the economy. But in underdevelop countries changes do not take place from within the economy rather they are outcome of imported ideas, technology and capital. Backward technology, l saving potential, and outmoded social, economic and political institutions incapable of leading to development from "within" in underdeveloped eco mies.

10. **Neglects the Effects of Growth of Population and Wealth.** Furth Schumpeter failed to take into account the impact of the growth of populati and wealth on the economic development of a country. High growth rate population tends to lower the growth rate of a developing economy, where the discovery of new sources of natural resources or their better use quick the pace of development.

11. **Unsatisfactory Explanation of Inflationary Forces.** In Schumpeter's syste inflationary impulses form an integral part of the process of development, bu involves no secular inflation. The long-term price level remains stable. Howev in an underdeveloped economy the inflationary forces are very powerful. 'Soc demand, working through political and labour union channels seeks to extra from the economy more than what, through domestic production and internatio trade, it can be made to yield. It is not only development and the associat investment that are responsible for inflationary tendencies, but the entire soc climate of a demand-oriented economy.[7]

**Conclusion.** All the same, Schumpeter's theory underlines the importa of inflationary financing and innovations as the main factors in economic dev lopment. Inflationary financing is one of the potent methods which every und developed country tries to use at one time or another. His analysis is relevant

[6]Henry C. Wallich, Some Notes Towards a Theory of Derived Demand in Aggarwal Singh (ed.) *op. cit.*, pp. 193-202.
[7]*Ibid.* pp. 203-204.





underdeveloped countries from the stand-point of long range increase in productivity and absorption of surplus labour in gainful employment as a result of innovations. Though it purports to analyse the problems of Western capitalism, "it can certainly give clues to problems that may arise in underdeveloped countries, once the process of industrialization begins, as well as provide a lesson for avoiding waste and extra hardships that attend an unplanned uncoordinated development."

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3. **Pseudo-Causal Relation.** Mrs Robinson calls Meade's model pseudo-ca because it merely states that monetary policy keeps the prices of consumpt goods constant, while money wage rates ensure full employment.

4. **Perfect Malleability of Machines.** Another serious defect of the neo-cla cal model stems from the assumptions that all machines are alike and there perfect malleability of machines. The latter implies that the ratio of labour machinery can be changed both in the short and long run. Thus Meade sid tracks the problem of foresight by assuming all machines alike and perf malleability of machines. This makes his model impracticable.

5. **No Place for Uncertainty.** According to Prof Butterick, there is no pla for uncertainty in Meade's model. The interrelations of all variables have bee regarded as certain. This detracts from the practicability of the model and simply remains a theoretical analysis.

6. **Closed Economy.** Like the Harrod-Domar and Joan Robinson models Meade's model is based on the assumption of a closed laissez-faire economy But this is an unrealistic assumption which neglects the importance of foreig trade and foreign capital in economic development.

7. **Neglects Institutional Factors.** Another serious defect of this model is tha it completely neglects the role of institutional factors in the development process Prof. Meade forgets that social, cultural, political and institutional factors play an important part in economic growth. In the absence of these factors his mode simply becomes Robinson Crusoe model.

8. **Mathematical Model.** The Meade model is primarily a mathematical model which contains a number of equations based on complex interrelations of the various variables. Thus it becomes difficult to understand.

**Conclusion.** Despite these defects, the Meade model has the chief merit of demonstrating the influences of population growth, capital accumulation and technical progress on the growth rate of national income and per capita real income over time. Further, the state of steady growth is indeed Mrs Robinson's Golden Age explained in a more realistic manner by studying the behaviour of those variables which she assumes as constants.

# 16

# Rostow's Stages of Economic Growth

PROFESSOR W. W. Rostow has sought an historical approach to the process of economic development. He distinguishes five stages of economic growth *viz.*, (1) the traditional society, (2) the pre-conditions for take-off, (3) the take-off, (4) the drive to maturity, and (5) the age of high mass-consumption.

This stage signifies a primitive society with its modes closest to modern science & technology.

## The Traditional Society

A traditional society has been defined "as one whose structure is developed within limited production functions based on pre-Newtonian science and technology and as pre-Newtonian attitudes towards the physical world."[1] This does not mean that there was little economic change in such societies. In fact, more land could be brought under cultivation, the scale and pattern of trade could be expanded, manufactures could be developed and agricultural productivity could be raised along with increase in population and real income. But the undeniable fact remains that for want of a regular and systematic use of modern science and technology 'a ceiling existed on the level of attainable output per head'. It did not lack inventiveness and innovations, but lacked the tools and the outlook toward the physical world of the post-Newtonian era.

The social structure of such societies was hierarchical in which family and clan connections played a dominant role. Political power was concentrated in the regions, in the hands of the landed aristocracy supported by a large retinue of soldiers and civil servants. More than 75 per cent of the working population was engaged in agriculture. Naturally, agriculture happened to be the main source of income of the State and the nobles, which was dissipated on the construction of temples and other monuments, on expensive funerals and weddings and on the prosecution of wars.

This stage covers a long period of a century during which the pre-conditions for take-off are created.

## The Pre-Conditions for Take off

The second stage is a transitional era in which the pre-conditions for sustained growth are created. The pre-conditions for subsequent growth were created slowly in Britain and Western Europe, from the end of the 15th and the beginning of the 16th centuries, when the Mediaeval Age ended and the Modern Age began. The pre-conditions for take-off were encouraged or initiated by four forces: The New Learning or Renaissance, the New Monarchy, the New World

[1]W.W. Rostow, *The Stages of Economic Growth*, 1960. Also, the *Process of Economic Growth*, 1953; *Trends in the Allocation of resources in Secular Growth*, ch. 15 in Economic Progress, (ed.) L.H. Dupriez & D.C. Hague, 1955; *The Takeoff into Self Sustained Growth*, in Aggarwal & Singh, *op. cit.*; "The Stages of Economic Growth", *Economic History Review*, August 1959.

and the New Religion or the Reformation. These forces led to 'Reasoning' and 'Scepticism' in place of 'Faith' and 'Authority', brought an end to feudalism and led to the rise of national states; inculcated the spirit of adventure which led to new discoveries and inventions and consequently the rise of the bourgeoisie—the elite—in the new mercantile cities. Thus these forces were instrumental in bringing about changes in social attitudes, expectations, structure and values. Generally speaking, the pre-conditions arise not endogenously but from some external invasion. For example, the pre-conditions ended in Europe (excluding Britain) with the domination of Napoleon Bonaparte whose victorious armies set in motion new ideas and attitudes which brought about changes in the structure of traditional societies and paved the way for the unification of Germany and Italy.

In any case, the process of creating pre-conditions for take-off from traditional society follows along these lines:

"The idea spreads that economic progress is possible and is a necessary condition for some other purpose, judged to be good; be it national dignity, private profit, the general welfare, or better life for the children. Education for some at least, broadens and changes to suit the needs of modern activity. New types of enterprizing men come forward in the private economy, in government, or both, willing to mobilize savings and to take risks in pursuit of profit to modernization. Banks and other institutions for mobilizing capital appear. Investments increase, notably in transport, communications and in raw materials in which other nations may have an economic interest. The scope of commerce, internal and external widens. And here and there, modern manufacturing enterprise appears, using the new methods."[2]

The pre-conditions for sustained industrialization, according to Rostow, have usually required radical changes in *three* non-industrial sectors: *First*, a build-up of social overhead capital, especially in transport, in order to enlarge the extent of the market; to exploit natural resources productively and to allow the State to rule effectively.

*Second*, a technological revolution in agriculture, so that agricultural productivity increases to meet the requirements of a rising general and urban population.

*Third*, an expansion of imports, including capital imports, financed by efficient production and marketing of natural resources for exports.

The continuous development and expansion of modern industry was mainly possible by the ploughing back of profits into fruitful investment channels. As Rostow says, "The essence of the transition can be described legitimately as a rise in the rate of investment to a level which regularly, substantially and perceptibly outstrips population growth."

The role of social and political factors in creating the pre-conditions has already been explained in the beginning of this 'stage'. But the political forces deserve further explanations with reference to underdeveloped countries and colonial territories.

It was "reactive nationalism"—reaction against the fear of foreign domination which acted as a potent force in bringing about the transition. "In Japan it was the demonstration effect, not of high profits or new manufactured consumers' goods

[2] *Ibid.*, pp. 6-7



but of the Opium War in China in the early 1840's and Commodore Perry's seven black ships, a decade later, that cast the die for modernization.

But in the colonies, the policy followed by the colonial power to build up social overhead capital, ostensibly to meet its own requirements, helped in moving the traditional society along the transitional path. The spread of modern education brought about a gradual transformation in thought, knowledge and attitude of the people, and a growing spirit of nationalism started resenting the colonial rule. Lastly, under the influence of a powerful international demonstration effect, people wanted the products of modern industry and modern technology itself.

Covers two or three decades in which the eco. transforms itself in such a way that eco growth subsequently takes place more or less automatically

**The Take-off**

The take-off is the 'great watershed' in the life of a society "when growth becomes its normal condition . . . , forces of modernization contend against the habits and institutions. The value and interests of the traditional society make a decisive breakthrough; and compound interest gets built into the society's structure". By the phrase compound interest Rostow implies "that growth normally proceeds by geometric progression, such as a saving account if interest is left to compound with principal". At another place, Rostow defines the take off "as an industrial revolution, tied directly to radical changes in the methods of production, having their decisive consequence over a relatively short period of time."

The take-off period is supposed to be short, lasting for about two decades. Rostow has given the following tentative take-off dates for those countries which are considered to be airborne.

| *Country* | *Take-off* | *Country* | *Take-off* |
|---|---|---|---|
| Great Britain | 1783-1802 | Japan | 1878-1900 |
| France | 1830-1860 | Russia | 1890-1914 |
| Belgium | 1833-1860 | Canada | 1896-1914 |
| United States | 1843-1860 | Argentina | 1935 |
| Germany | 1850-1873 | Turkey | 1937 |
| Sweden | 1868-1890 | India, China | 1952 |

**Conditions for Take-off.** The requirements of take-off are the following three related but necessary conditions:—

"(1) a rise in the rate of productive investment from, say, 5 per cent or less to over 10 per cent of national income or net national product;

(2) the development of one or more substantial manufacturing sectors with a high rate of growth;

(3) the existence of quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector and gives to growth an outgoing character."[3]

Let us examine these conditions in detail.

(1) **Rate of Net Investment over 10 per cent of National Income.** One of the essential conditions for take-off is that the increase in per capita output should outstrip the growth of population to maintain a higher level of per capita income in the economy. As Rostow explains: "If we take the marginal capital output ratio for economy in its early stages of economic development at 3.5:1 and if w

[3] *Ibid.*, p. 39

assume, as is not abnormal, a population rise of 1-1.5 per cent per annum, it is clear that something between 3.5 and 5.25 per cent of NNP must be regularly invested if NNP per capita is to be sustained. An increase of 2 per cent per annum in NNP per capita requires, under these assumptions that something between 10.5 and 12.5 per cent of NNP be regularly invested. By definition, the assumption, then, a transition from relatively stagnant to substantial regular growth in NNP per capita under typical population conditions, requires that the proportion of national product productively invested should move from something in the vicinity of 5 per cent to something in the vicinity of 10 per cent."[4]

The typical case explained by Rostow is based on the supposition that the incremental capital-output ratio and the rate of population growth remain constant. It thus precludes the effects of increased labour force and improved technology on national income. However, during the take off capital-output ratio tends to decline with the change in investment pattern and a rise in the proportion of net investment to national income takes place from 5-10 per cent, definitely outstripping the growth of population.

(2) **Development of Leading Sectors.** Another condition for take-off is the development of one or more leading sectors in the economy. Rostow regards the development of leading sectors as the 'analytical bone structure' of the stages of economic growth. There are generally three sectors of an economy:

(*a*) **Primary Growth Sectors.** where possibilities of innovation or of exploiting new or unexplored resources lead to a higher growth rate than in the rest of the economy. The cotton textiles of Britain and New England in the early stages of growth fall into this category.

(*b*) **Supplementary Growth Sectors,** where rapid growth takes place as a consequence of development in the primary growth sectors. For example, the development of railways is a primary growth sector and the expansion of iron, coal and steel industries may be regarded as a supplementary growth sector.

(*c*) **Derived Growth Sectors.** where growth takes place "in some fairly steady relation to the growth of total income, population, industrial production or some overall modestly increasing variable." For example, the production of food and the construction of houses in relation to population.

Historically, these sectors have ranged from textiles in Britain and New England to railways in the United States, the USSR, Germany and France; to modern timber cutting in Sweden. In addition, modern agriculture also forms part of the leading sectors. For example, the rapid growth of Denmark and New Zealand has been due to the scientific production of bacon, eggs, and butter and mutton and butter respectively. Thus, "there is clearly, no one sector in sequence to take-off, no single sector which constitutes the magic key."

According to Rostow, the rapid growth of the leading sectors depends upon the presence of four basic factors:

*First*, there must be an increase in the effective demand of their products generally brought about by dishoarding, reducing consumption, importing capital or by a sharp increase in real incomes.

*Second*, a new production function alongwith an expansion of capacity must be introduced into these sectors.

[4] *Ibid.*, pp 52-53 and 57.





*Third*, there must be sufficient initial capital and investment profits for the take-off in these leading sectors.

*Lastly*, these leading sectors must introduce expansion of output in other sectors through technical transformations.

(3) **Cultural Framework that Exploits Expansion.** The last requirement for take off is the existence or emergence of cultural framework that exploits the impulses to expansion in the modern sector. A necessary condition for this is the ability of the economy to mobilize larger savings out of an expanding income to raise effective demand for the manufactured products, and to create external economies through the expansion of leading sectors. As Rostow says, "Take off requires the massive set of pre-conditions, going to the heart of a society's economic organization, its politics and its effective scale of values .... It usually witnesses a definitive social, political and cultural victory of those who would modernize the economy over those who would either cling to the traditional society or seek other goals .... By and large, it persuades the society to persist and to concentrate its efforts on extending the tricks of modern technology beyond the sectors modernized during the take off."[5]

The take-off stage is explained in Fig. 16.1. $X$-axis represents NNP and $Y$-axis the amount of saving, net investment and capital. $S$ is the saving schedule. $K_0Y_0$ and $K_1Y_1$ are the curves of capital-output ratio drawn as downward sloping to simplify the figure. They are drawn parallel to each other to indicate a constant capital-output ratio, *i.e.*, $OK_0/OY_0 = OK_1/OY_1$. $TY_0/Y_0Y_1$ is the marginal capital-output ratio.

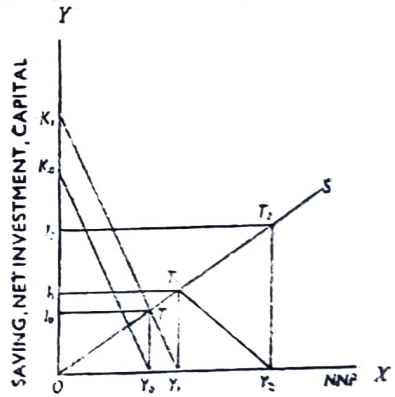


Fig. 16.1

To start with, the society has a very flat saving curve and a very steep capital-output curve in the pre-take off stage. It implies that people save little out of their income and the capital-output ratio is very high. In the time period 0, as $OI_0$ net investment is made it tends to increase the capital stock which becomes productive in time period 1 and raises NNP to $OY_1$. Then in the take off stage when $OI_1$ $(= Y_1T_1)$ investment takes place, some major stimulus leads to the growth of the productive capital more quickly leading to a fall in the capital-output ratio to $T_1Y_1/Y_1Y_2$. As a result, the investment pattern changes and thecapital-output ratio curve becomes flatter. It is $T_1Y_2$. NNP increases to $OY_2$ which further raises net investment to $OI_2$ $(= Y_2T_2)$. The economy has taken off, and if this pattern of growth is continued it will become self-sustained.

Thus the take-off is initiated by a sharp stimulus, such as the development of a leading sector or a political revolution which brings an outgoing change in the production processes, a rise in proportion of net investment to over 10 per cent

[5] *Ibid.*, p. 58 Italics mine.

of national income outstripping the growth of population.

**The Drive to Maturity**

Rostow defines it "as the period when a society has effectively applied range of (then) modern technology to the bulk of its resources". It is a period of long sustained economic growth extending well over *four* decades. New duction techniques take the place of the old ones. New leading sectors are ted. Rate of net investment is well high over 10 per cent of national income. And the economy is able to withstand unexpected shocks.

Rostow gives the symbolic dates for technological maturity of the following countries:

| | | | |
|---|---|---|---|
| Great Britain | 1850 | Sweden | 1930 |
| United States | 1900 | Japan | 1940 |
| Germany | 1910 | Russia | 1950 |
| France | 1910 | Canada | 1950 |

When a country is in the stage of technological maturity, *three* significant changes take place:

*First*, the character of working force changes. It primarily becomes skilled. People prefer to live in urban areas rather than in rural. Real wages start rising and the workers organize themselves in order to have greater economic and social security.

*Second*, the character of entrepreneurship changes. Rugged and hardworking masters give way to polished and polite efficient managers.

*Third*, the society feels bored of the miracles of industrialization and wants something new leading to a further change.

**The Age of High Mass-consumption**

The age of high mass-consumption has been characterized by the migration to suburbia, the extensive use of the automobile, the durable consumers' goods and household gadgets. In this stage, "the balance of attention of the society shifted from supply to demand, from problems of production to problems of consumption and of welfare in the widest sense". However, three forces are discernible that tend to increase welfare in this post-maturity stage. *First*, the pursuit of national policy to enhance power and influence beyond national frontiers. *Second*, to have a welfare state by a more equitable distribution of national income through progressive taxation, increased social security and leisure to the working force. *Last*, decisions to create new commercial centres and leading sectors like cheap automobiles, houses and innumerable electrically operated household devices, etc.

The tendency towards mass consumption of durable consumer goods, continued full employment and the increasing sense of security has led to a higher rate of population growth in such societies.

Historically, the United States was the first to reach the age of high mass consumption in the 1920's, followed by Great Britain in the 1930's, Japan and Western Europe in the 1950's and the Soviet Union after the death of Stalin.

**Criticism of the Stages of Economic Growth**

Rostow's *The Stage of Economic Growth* is the most widely circulated



and highly commented piece of economic literature in recent years. Economists are one in doubting the authenticity of the division of economic history into five 'stages of growth' as presented by Rostow. Are these 'stages' inevitable like birth and death, or do they follow a set 'sequence' like childhood, adolescence, maturity and old age? Can one tell with sufficient precision that one stage is complete and the other has begun? "To maintain that every economy follows the same course of development with a common past and the same future is to over schematize the complex forces of development and to give the sequence of stages a generality that is unwarranted."[6] Let us comment on these 'stages' in detail.

(1) **Traditional Society not Essential for Development.** A number of nations such as the United States, Canada, New Zealand and Australia were born free of traditional societies and they derived the preconditions from Britain, a country already advanced. So it is not essential for growth that a country must pass through the first stage.

(2) **Preconditions may not Precede the Take-off.** In the case of 'preconditions', it is not necessary that they must precede the take-off. For example, there is no reason to believe that an agricultural revolution and accumulation of social overhead capital in transport must take place before the take-off.

(3) **Overlapping in the Stages.** In fact, the experience of most countries tells us that development in agriculture continued even in the take-off stage. The take-off in the case of New Zealand and Denmark is attributed to agricultural development. Similarly, social overhead capital in transport, especially in railways has been one of the leading sectors in the take-off as Rostow himself tells us. It shows that there is considerable overlapping in the different stages.

(4) **Criticism of the Take-off.** The most widely discussed and controversial stage is the take off. As Cairncross has stated: "The stage that has struck the public mind most forcibly is undoubtedly that of the take-off. Largely, no doubt, because the aeronautical metaphor-prolonged in the phrase 'into self-sustained growth'—suggests at once an effortlessness and finality congenial to modern thought. The reactions of historians and economists have been less favourable. They have grown accustomed to emphasizing the continuity of historical change, to tracing back to a previous age the forces producing a social explosion and to explaining away the apparent leaps in economic development. They are inclined, therefore, to regard Rostow as a latter day Toynbee, stressing a discontinuity that is no more than symptomatic of the underlying forces at work and making the symptoms more decisive than they really were."[7]

(*i*) *The Take-off Dates are Doubtful.* Economic historians are sceptical about the take-off dates suggested by Rostow. The dates also vary from publication to publication. For instance, the take-off year for India in the article *The Take-off into Self-sustained Growth* was given as 1937, while in the latter publications it has been put as 1952. In fact, it will take many years of research to determine the correctness or otherwise of the dates suggested by Rostow.

(*ii*) *Possibilities of Failure Not Considered.* According to Habakkuk, "In his

[6]G.M. Meier, *Leading Issues in Development Economics* Prof. Habakkuk in his review of Rostow's 'Stages' wrote that "the work is essentially an essay in classification which contains some ideas on how one stage proceeds to the next, but they do not cohere into anything which could reasonably be signified as a theory of production. (Italics mine).

[7]A.K. Cairncross, *op. cit.*, p. 138.

aeronautical concept of growth, he (Rostow) ignored the bump downs and landings."

Further 'the analysis of the take off neglects the effect of historical heri time of entry into the process of modern economic growth, degree of backw ness and other relevant factors on the characteristics of the early phase modern economic growth in the different *underdeveloped* countries'.

(iii) Even the necessary conditions for take-off are not without *limitation*

(a) *Growth Rate of Investment is Arbitrary*. The first condition, of a rise the rate of productive investment to over 10 per cent of national income is ar rary. As Das Gupta has remarked: "What is the sanctity about this particu percentage, except that with 10 per cent annual saving one may expect an eco my to acquired a higher trend of per capita income unless the capital-output ra and the rate of population growth are abnormally high. A demarcation al this line is surely arbitrary."[8] Moreover, there is no historical data to justify *sharp* increase in the *saving-income ratio* at the beginning of industrializati On the contrary, this ratio has been increasing gradually as growth proceeded

(b) *Some Specific Industries cannot be the Leading Sectors*. The second con tion relates to the rapid development of leading sectors. Rostow has laid emp sis on a limited number of leading sectors like textiles, railroads, etc. But eco mic growth has not always been governed by the development of a few leadi sectors. *Cairncross* questions the utility of this idea in helping us to understa the take-off. And there appears to be no basis on which to recognize a leadi sector exante. He asks "What connection is there between the conception a later stages? Why must the leading sectors be in manufacturing? If railway buil ing can qualify, why not retail distribution or agriculture?"[9]

(c) *Little Difference between the First and Third Condition*. The last conditi for take-off is the existence or emergence of a cultural framework which gives growth an outgoing character. According to Rostow the necessary condition f this is the 'capacity to mobilize capital, from domestic sources', and this is fact nothing else but the first condition of take-off restated. Moreover, as Cai cross opines, "A definition in these terms tells us nothing about the factors work since we can only deduce their existence from the fact of take-off, never th likelihood of take-off from the ascertained fact of their existence."[10]

(5) **The Stage of Drive to Maturity Puzzling and Misleading**. It contains the features of the take-off-rate of net investment over 10 per cent of nation income, development of new production techniques, leading sectors and insti tions. Then where lies the need for a separate stage where the growth proce becomes self-sustained. It can be self-sustained even in the take-off stage. In fac as observed by Kuznets, no growth is purely self-sustaining or self-limiting. Th characterization of one stage of growth as self-sustained and of others, by implic tion, as lacking that property, requires substant evidence and analysis provided by Rostow."[11]

(6) **The Stage of High Mass Consumption hronological**. The age of hi

[8] A.K. Dass Gupta, *Planning and Economic Growth*, p 58.
[9] *Op., cit.*, p. 142.
[10] *Ibid.*, p. 143.
[11] In G.M Meier, *op. cit.*





mass-consumption is so defined that certain countries like Australia and Canada have entered this stage before even reaching maturity. According to one critic, "the period of mass-consumption is nothing else but *minus* its ideological over-tone."

**Importance and Limitations of Take-off for Underdeveloped Countries**

**Importance**. The concept of take-off is ideally suited for the industrialization of underdeveloped countries. As Das Gupta has written, "The term lacks precision and yet it is suggestive and can be given interpretation which is useful for an understanding of the process of economic development of an underdeveloped country. It is indeed the vagueness of the term that gives it strength for one can put an interpretation upon it to suit the conditions of the economy in which one is interested."[12]

Of the three necessary conditions for take-off, the first two, namely, capital formation over 10 per cent of national income and the development of one or more leading sectors, are helpful in the process of industrialization of underdeveloped countries. So far as the first condition is concerned, there can be little doubt about achieving that percentage. But the second condition can be moulded to suit a country's environments. For instance, the leading sectors can be in agriculture or in the production of primary products for exports. The last condition is more important in the context of underdeveloped countries where monetary and political institutions, and skills and technology are at a low level whereby they retard the expansion of the modern sector.

**Limitations**

From the stand point of underdeveloped countries the take-off has the following limitations.

**Capital-output Ratio not Constant.** In calculating the aggregate capital requirements of underdeveloped countries Rostow takes a constant capital-output ratio. This implies constant returns to scale. This assumption is valid in case of advanced economies. But underdeveloped economies are characterized by the predominance of agriculture and primary production. Given unchanged techniques and increasing population, their natural resources result in conditions of diminishing returns to scale for the expansion of the economy as a whole.[13]

**Silent Over the Removal of Unemployment**. Das Gupta regards the 'elimination of an accumulated backlog of unemployment' as 'the minimum that the take-off must accomplish' in an underdeveloped economy. According to him, "once full employment is secured the economy is raised to a level where growth is self-sustained and spontaneous." Taking India's case, he says, "Judged by the employment criterion, despite all the investment that has taken place over the period, our economy seems to be receding." Therefore, it is imperative for an over-populated country, to have the elimination of unemployment as one of the conditions for take-off.

**Element of Ambiguity**. Besides, there is an element of ambiguity in this concept of take-off when applied to an underdeveloped country. During the take-off

[12] *Op, cit.*, p. 156.
[13] H. Myint, *The Economics of the Developing Countries*, 1964.

investment increases with a rise in the national income without reducing average propensity to consume. Technically speaking, there is an "excess of 'marginal' rate of saving over the average rate of saving, so that the average keeps on rising...(and) the final level is characterized by a constant, though average rate of savings." To Dasgupta, "This does not seem to be a very interpretation. For even in a highly developed economy the average rate of ing may not remain constant."

**Economic Development not Spontaneous.** The concept of take-off suggests element of spontaneity which is of little significance in the context of an developed economy. But "a take-off is not an instantaneous process. It is an cise that raquires time and from which, after a certain speed has been attained and a portion of the runaway used up, there is no turning back or even throttling down."[14]

**Aeronautical Concept not Correct.** Professor Bicanic, however, does not with the symbolical presentation of the take-off, because it appears to him light flying animal just got cut off from the earth and floating in the air. like creeping over a very difficult threshold of economic development. One to creep over it, one can't fly over it. It is not a take-off but a very painful cess which every underdeveloped country has to go through.[15]

**The Take-Off and India**

According to Rostow, one of the important conditions for take-off is raising of saving and investing ratio from 5 per cent or less to over 10 per of national income and maintaining it for two or more decades. It is a critical transitional stage of self-sustained growth. In India at 1960-61 prices the ratio investment to national income increased from 5.5 per cent in 1950-51 to 10.4 cent in 1964-65 and the ratio of domestic savings to national income from per cent to 10.5 per cent. Thus India which entered the take-off stage in 1950 (1952 according to Rostow), can be definitely said to have taken-off in the 1964-65 when both the saving investment ratios were above 10 per cent.

*The Second* condition for take-off is the development of one or more lead sectors in the economy. By 1964-65 the agricultural, industrial, and tertiary sectors had developed considerably. To illustrate, the index of agricultural production (with June 1950 as the base) rose from 45.6 in 1950-51 to 158.4 in 1964-65 and the index of industrial production, (with 1956 as the base) from 73.5 186.9. India also seems to fulfil this condition of take-off.

India also fulfils the *third* condition for take-off. Planned development generated the cultural framework that leads to the expansion of the modern sector. The skills and attitudes of the people are undergoing changes, modern technology is permeating the traditional society and the administrative efficiency and honesty have been showing signs of improvement.

But there is no hard-and-fast rule for the presence of all the three conditions for take-off. Nor should one jump to the conclusion that India has definitely taken-off during the Third Plan on the basis of the existence of the three Rostowian conditions. It appears that India has tried a premature take off. Professor

[14] John P. Lewis, *Quiet Crises in India.*
[15] Bicanic, R., in *Paths to Economic Growth*, (Ed.) A Datta.





Myint warns that a premature attempt at take-off "can result not only in wastages of scarce resources wrongly or inefficiently invested but also in a sense of disappointment and frustration which may have far reaching psychological and political consequences." This has actually happened in the case of the Indian economy. Between 1950-51 and 1964-65, India's net national income (at 1960-61) increased at a compound rate of 3.8 per cent per annum from Rs. 9,850 crores to Rs 16,630 crores but per capita income in real terms increased at an annual average rate of 1.8 per cent, the rate of population growth being 2.5 per cent per year. Coupled with these trends is the existence of inflationary pressures in the economy which cast serious doubts about India having attained the take-off stage. In the last year (1965-66) of the Third Plan national income declined by 5.6 per cent. Per capita real income in 1965-66 was almost the same as in 1960-61. Recession in the economy during 1966-68 made matters still worse. As revealed by the Estimates Committee of the Lok Sabha in its ninth report, there was nearly 80 to 90 per cent of unutilized capacity in some industries in 1965-66 and even in the case of priority industries, idle capacity was 40 per cent. Further the rate of domestic savings declined from 10.5 per cent in 1965-66 (at 1960-61 prices) to 8.2 per cent in 1966-67 and to 8 per cent in 1967-68. In real terms, it would be even below the pre-Plan period.

The Third Plan was conceived as "the first stage of a decade or more of intensive development leading to a self-reliant and self-generating economy." It aimed at raising net investment from 11 per cent in 1960-61 to 14-15 per cent of national income and that of domestic savings from 8 per cent in 1960-61 to 11.5 per cent of national income by the end of the Third Plan. But the Third Plan failed to bring about the required rates of growth in savings and investment. Savings rose from 8-10.5 per cent and investment from 11-13 per cent. Three consecutive crop failures plunged the economy into amorass. An era of Annual Plans ensued. The Draft Fourth Plan was scrapped and postponed. However, it can be concluded in terms of Rostow's main condition of 'a rise in the proportion of net investment to over 10 per cent, that the Indian economy had taken-off during the Third Plan.

factor in determining growth in developing countries by Harrod in his growth model renders Harrod's concept of 'warranted' growth rate analytically inadequate for the purpose of developing countries. The apparent reason for this exclusion is to be partly found in Harrod's desire to make place for the acceleration principle in his growth model. He also ignored the role of public investment to which Keynes assigned a crucial role. But, autonomous investments, whether public or private, are of pivotal importance to the developing countries. Besides, Harrod-Domar growth models assume that propensity to save and the capital-output ratio are constant. But actually they are likely to change over the long run. Further, if the proportion of factors can be changed as labour may be substituted for capital, then adjustment within the economy can be easily made and steady growth made possible without any rigid conditions.

In spite of the fact that these models are of limited applicability to the developing countries and fail to highlight the crucial issues involved in the development process of these economies they nevertheless *are useful in fixing the overall targets of income, investment and savings* and in checking the consistency of such targets. Prof. Kurihara states that "Harrod and Domar have made the essential nature of the growth mechanism operationally significant, for they stress saving ratio and the capital-output ratio (or its reciprocal) as measurable strategic variables to investigate and possibly to manipulate for a desired rate of growth. Because of the universal character of these strategic variables, the growth mechanism discussed by Harrod and Domar is applicable to all economic systems, albeit with the modification".[7]

An indirect use of these models has actually been made in some countries. For instance, in the First Five Year Plan of India, the rate of saving was planned to be raised through keeping the marginal rate of saving above the average rate of saving. And the current rate of capital formation and therefore growth of the economy was sought to be maximised through raising the marginal rate of saving. Thus, these models served to guide the planners in determining the growth rate of the Indian economy. Commenting on these models, Prof. S. Chakravarty remarks that "*The great service that these models perform is to indicate very roughly the dimensions of the problem involved in raising the per capita income level in an underdeveloped country*".[8] As noted above, Harrod-Domar model brings out the crucial role for the continuous growth of investment to ensure sustained growth at a steady rate. If investment is not growing sufficiently, the problem of deficient demand will emerge which will bring about recesionary condition even in a developing country. The demand recession will result in rise in capital-output ratio due to the underutilisation of productive capacity. The Indian growth experience clearly brings out this fact. From the mid-sixties to the late seventies the Indian economy witnessed the problem of demand deficiency due to the fall in public investment resulting in lower industrial growth and increase in capital-output ratio. Again during 1997-2003 low industrial growth rate was achieved due to deficiency in demand resulting from stagnation in investment.

Further, Prof. Kurihara contends that though these models are "designed to indicate the conditions of progressive equilibrium for an advanced economy", yet he says these models are "important not only because they represent a stimulating attempt to dynamise and secularise Keynes's static short-run saving-investment theory, but also because they are capable of being modified so as to *introduce fiscal policy parameters as explicit variables* in the economic growth of an under-developed country".[9] He further writes, these growth models have this positive lesson for under-developed economies, that state should be allowed to play not only a stabilizing role but also a developmental role, if these economies are to industrialise more effectively and rapidly than the now industrialised economies did in conditions of *laissez faire*.[10]

6. *Ibid.*, p.185
7. K.K. Kurihara, *The Keynesian Theory of Development*, 1959. Ch. 9. pp.153-154
8. S. Chakravarty, *Op. cit.*
9. K.K. Kurihara, *The Keynesian Theory of Development, 1959*. Ch.9. pp.153-154.
10. *Ibid.*, p.185.



CHAPTER 41

# NEOCLASSICAL THEORY OF GROWTH

## Introduction

Having discussed Harrod-Domar growth model in the last chapter we will discuss neoclassical growth theory in the present chapter. The neoclassical growth theory was developed in the late 1950s and 1960s of the twentieth century as a result of intensive research in the field of growth economics. The American economist Robert Solow[1], who won a Nobel Prize in Economics and the British economist, J. E. Meade[2] are the two well known contributors to the neo-classical theory of growth. This neoclassical growth model lays stress on capital accumulation and its related decision of saving as an important determinant of economic growth. Neoclassical growth model considered two-factor production function with capital and labour as determinants of output. Besides, it added *exogenously determined factor, technology*, to the production function. Thus neoclassical growth model uses the following production function :

$$Y = AF(K, L) \qquad \ldots (i)$$

Where $Y$ is Gross Domestic Product (GDP), $K$ is the stock of capital, $L$ is the amount of unskilled labour and $A$ is exogenously determined level of technology. Note that change in this exogenous variable, technology, will cause a shift in the production function.

There are two ways in which technology parameter $A$ is incorporated in the production function. One popular way of incorporating the technology parameter in the production function is to assume that technology is *labour augmenting* and accordingly the production function is written as

$$Y = F(K, AL) \qquad \ldots (ii)$$

Note that labour-augmenting technological change implies that it increases productivity of labour.

The second important way of incorporating the technology factor in the production function is to assume that technological progress *augments all factors* (both capital and labour in our production function) and not just augmenting labour. It is in this way that we have written the production function equation (*i*) above. To repeat, in this approach production function is written as

$$Y = AF(K, L)$$

Considering in this way $A$ represents *total factor productivity* (that is, productivity of both factor inputs). When we empirically estimate production function specified in this way, then contribution of $A$ to the growth in total output is called *Solow residual* which means that total factor productivity really measures the increase in output *which is not accounted for by changes in factors, capital and labour.*

Unlike the fixed proportion production function of Harrod-Domar model of economic growth, neoclassical growth model uses *variable proportion production function*, that is, it considers unlimited *possibilities of substitution between capital and labour* in the production process. That is why it is called neoclassical growth model as the earlier neoclassicals considered such a vari-

1. Robert Solow, "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, February 1956.
2. J. E. [illegible]

able proportion production function. The second important departure made by neoclassical growth theory from Harrod-Domar growth model is that it assumes that *planned investment and saving are always equal* because of immediate adjustments in price (including interest). With these assumptions, neoclassical growth theory focuses its attention on supply side factors such as capital and technology for determining rate of economic growth of a country. Therefore, unlike Harrod-Domar growth model, it does not consider aggregate demand for goods limiting economic growth. Therefore, it is called '*classical*' along with '*neo*'. The growth of output in this model is achieved at least in the short run through higher rate of saving and therefore higher rate of capital formation, However, diminishing returns to capital limit economic growth in this model. Though the neoclassical growth model assumes *constant returns to scale* which exhibits *diminishing returns to capital and labour separately.*

We explain below how neoclassical growth model explains economic growth through capital accumulation (*i.e.*, saving and investment) and how this growth process ends in *steady state equilibrium. By steady state equilibrium for the economy we mean that growth rate of output equals growth rate of labour force and growth rate of capital* $\left(i.e. \frac{\Delta Y}{Y}=\frac{\Delta N}{N}\right)$ *so that per capita income and per capita capital are no longer changing*. Note that for income per capita and capital per worker to remain constant in this steady state equilibrium when labour force is growing implies that *income and capital must be growing at the same rate as labour force.* Since growth in labour force (or population) is generally denoted by letter '$n$', in this steady state equilibrium, therefore, $\frac{\Delta Y}{Y}=\frac{\Delta K}{K}=\frac{\Delta N}{N}=n$. Neoclassic growth theory explains the process of growth from any initial position to this steady state equilibrium.

**Neoclassical Growth Theory : Production Function and Saving**

As stated above, neoclassical growth theory uses following production function :

$$Y = AF(K, L)$$

However, the neoclassical theory explains the growth process using the above production function in its intensive form, that is, in per capita terms. To obtain the above production function in per capita terms we divide both sides of the given production function by $L$, the number of labour force. Thus

$$\frac{Y}{L}=AF\left(\frac{K}{L},\frac{L}{L}\right)$$

$$=AF\left(\frac{K}{L},1\right)=AF\left(\frac{K}{L}\right) \quad \ldots (2)$$

To begin with we assume that there is no technological progress. With this assumption then equation (2) is reduced to

$$\frac{Y}{L}=F\left(\frac{K}{L}\right) \quad \ldots (3)$$

The equation (3) states that output per head $\left(\frac{Y}{L}\right)$ is a function of capital per head $\frac{K}{L}$. Writing $y$ for $\frac{Y}{L}$ and $k$ for $\frac{K}{L}$ equation (3) can be written as

$$y = f(k) \quad \ldots (4)$$



Now, in Figure 41.1 we represent the production function (4) in per capita terms. It will be noticed from Figure 41.1 that as capital per capita ($k$) increases output per head increases, that is, marginal product of labour is positive. But, as will be seen from Figure 45.1, the slope of the production function curve decreases as capital per head increases. This implies that marginal product of capital diminishes.

That is, the increase in capital per worker causes output per worker to increase but at a diminishing rate.

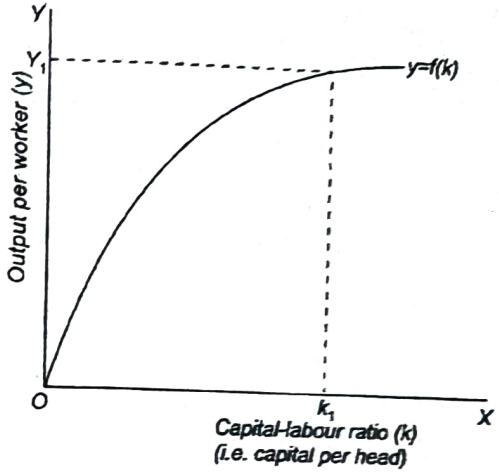


**Fig. 41.1.** *Production function relating output per head to output per head*

It will be seen from Figure 41.1 that at capital-labour ratio (*i.e.*, capital per worker) equal to $k_1$, output per head is $y_1$. Similarly we can read from the production function curve: $y = f(k)$ the output per head corresponding to any other capital per head.

**Neoclassical Growth Theory : Fundamental Growth Equation**

According to neoclassical theory, rate of saving plays an important role in the growth process of an economy. Like the Harrod-Domar model, neoclassical theory considers saving as a *constant fraction of income*. Thus,

$$S = sY \quad \ldots (5)$$

where $S$ = saving

$Y$ = income

$s$ = propensity to save

Since $s$ is a constant fraction of income, average propensity to save is equal to marginal propensity to save. Further, since national income equals national product, we can also write equation(5) as

$$sY = sF(K, L)$$

As in neoclassical theory planned investment is always equal to planned saving, *net addition to the stock of capital* is ($\Delta K$), which is the same thing as net investment ($I$), can be obtained by deducting *depreciation* of capital stock during a period from the planned saving. Thus,

$$\Delta K = I = sY - D \quad \ldots (6)$$

Where $\Delta K$ = net addition to the stock of capital, $I$ stands for investment and $D$ for depreciation. Depreciation occurs at a certain percentage of the existing capital stock. The total depreciation ($D$) can be written as

$$D = dK$$

Substituting $dK$ for $D$ in equation (6) we have

$$\Delta K = sY - dK$$

or

$$sY = \Delta K + dK \quad \ldots (7)$$

Now dividing and multiplying the first term of the right hand side of equation (7) by $K$ we have

$$sY = K.\frac{\Delta K}{K} + dK \quad \ldots (8)$$

We have seen above, *for the steady state equilibrium*, growth of capital $\left(\frac{\Delta K}{K}\right)$ must be equal to growth of labour force $\left(\frac{\Delta L}{L}\right)$, so that capital per worker and therefore income per head remains constant. If we denote growth rate of labour force $\left(\frac{\Delta L}{L}\right)$ by $n$, then in steady state Substituting $n$ for $\frac{\Delta K}{K}$ in equation (8) we have

$$sY = K.\,n + dK$$

or

$$sY = (n + d)\,K \quad \ldots (9)$$

The above equation (9) is a *fundamental growth equation of the neoclassical growth model and states the condition for the steady state equilibrium when capital per worker and therefore income per capita remains constant even though population or labour force is growing.* Thus, for steady state growth equilibrium capital must be increasing equal to $(n + d)\,K$. Therefore $(n + d)\,K$ represents the *required investment* (or change in capital stock) which ensures steady state when capital and income must be growing at the same rate as labour force (or population)

## The Growth Process

From the growth equation (9) it is evident that if planned *saving sY is greater than the required investment, (i.e. $(n+d)K$), to keep per capita income constant, capital for worker will increase.* This increase in capital per worker will cause increase in productivity of worker. As a result, the economy will grow at higher rate than the steady-state equilibrium growth rate. However, this higher growth rate will not occur endlessly because diminishing returns to capital will bring it down to the steady rate of growth, though at a higher level of per capita income and capital per worker.

In order to graphically show the growth process the growth equation is conventionally used in *intensive form*, that is, in per capita terms. In order to do so we divide both sides of equation (9) by $L$ and have

$$\frac{sY}{L} = (n+d)\frac{K}{L}$$

where $\frac{Y}{L}$ represents income per worker and $\frac{K}{L}$ represents capital per worker (*i.e.* capital-labour ratio). Writting $y$ for $\frac{Y}{L}$ and $k$ for $\frac{K}{L}$ we have

$$sy = (n + d)\,k \quad \ldots (10)$$

The equation (10) represents fundamental neoclassical growth equation in per capita (*i.e.*, per worker) terms.



**Growth Process and Steady Growth Rate.** Figure 41.2 shows the growth process that moves the economy over time from an initial position to the steady state equilibrium growth rate. In this Figure 41.2 along with per capita production function ($y = f(k)$) we have also drawn per capita saving function curve $sy$. Besides, we have drawn $(n + d)k$ curve which depicts required investment per worker to keep constant the level of capital per capita when population or labour force is growing at a given rate $n$.

In Figure 41.2 $y = f(k)$ is per capita production function curve as in Figure 41.1. Since per capita saving is a constant fraction of per capita output (*i.e.* income), the curve $sy$ depicting per capita saving function is drawn below the per capita output function curve ($y = f(k)$) with

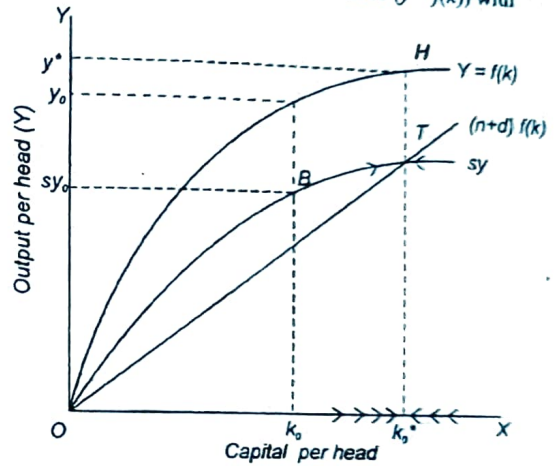


**Fig. 41.2.** *Neoclassical Model : Growth Process and Steady State Equilibrium*

the same shape. Another straight line curve labelled as $(n + d)k$, is drawn which depicts the *required investment* to keep capital per head (*i.e* capital-labour ratio) constant at various levels of capital per head.

Now, let us assume the current capital per head is $k_0$ at which per capita income (or output) is $y_0$ and per capita saving is $sy_0$. It will be seen from Figure 41.2 that at capital per head $k_0$, per capita saving $sy$ exceeds investment required to maintain capital per head equal to $k_0$, ($sy_0 > (n + d)k$). As a result, capital per head ($k$) will rise (as indicated by horizontal arrows) which will lead to increase in per capita income and the economy moves to the right. This adjustment process will continue so long as $sy > (n + d)\,k$. It will, seen when the economy reaches at capital per head equal to $k^*$ and per capita income equal to $y^*$ corresponding to which saving curve $sy$ intersects the $(n + d)\,k$ curve at point $T$.

It will be noticed from Figure 41.2 that the adjustment process comes to rest at capital per head equal to $k^*$ because saving and investment corresponding to this state is equal to the investment required to maintain capital per head at $k^*$. Thus point $T$ and its associated capital per head equal to $k^*$ and income or output per head equal to $y^*$ represent the steady state equilibrium. It is worth noting that whether the economy is initially at the left or right of $k^*$, the adjustment process leads to the steady state at point $T$. It may however be noted that in steady-state equilibrium, the economy is growing at the same rate as labour force (that is, equal to $n$ or $\Delta L/L$).

It will be seen from Figure 41.2 that although growth of economy comes down to the steady growth rate, its levels of per capita capital and per capita income at point $T$ are greater as compared to the initial state at point $B$.

An important economic implication of the above growth process visualised in neoclassical growth model is that *different countries having same saving rate and population growth rate and access to the same technology will ultimately converge to same per capita income although this convergence process* may take different times in different countries.

**Impact of Increase in the Saving Rate**

As has been explained above that in steady state, both capital per head ($k$) and income per head ($y$) remain constant when economy is growing at the rate of growth of population or labour force (*i.e.* $n$). In other words, in steady state equilibrium $\Delta k = 0$ and $\Delta Y = 0$. It follows from this that steady state growth rate or long-run growth rate which is equal to population or labour force growth rate $n$ is not affected by changes in the saving rate. Changes in the saving rate affect only the *short-run growth rate* of the economy. This is an important implication of neoclassical growth model.

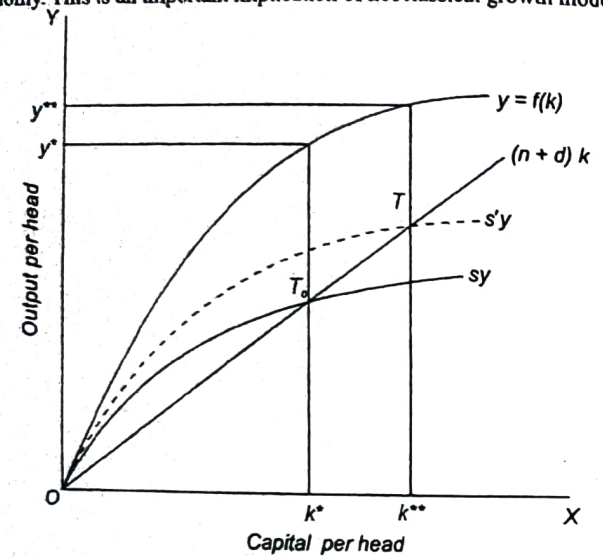


**Fig. 41.3.** *Impact of Increase in Saving Rate*

Now an important question is why do we get this apparently incredible result from the neoclassical growth theory. Impact of increase in the saving is illustrated in Figure 41.3. It will be seen from this figure that initially with the saving curve $sy$, the economy is in steady state at point $T_0$ where the saving curve $sy$ intersects required investment curve $(n + d)\ k$ with $k^*$ as capital per head and $y^*$ as income (output) per capita. Now suppose that saving rate increases, that is, individuals in the society decide to save a higher fraction of their income. As a result, saving curve shifts to the new higher position $s'y$ (dotted). This higher saving curve $s'y$ intersects the $(n + d)k$ curve at point $T_1$ which therefore represents the new steady state. We thus see that increase in saving rate moves the steady state equilibrium to the right and causes both capital per head and income per head to rise to $k^{**}$ and $y^{**}$ respectively Note that in the new steady state the economy grows at the same rate as the growth rate of labour force (or population) which is denoted by $n$. It therefore follows that long-run growth rate of the economy remains unaffected by the increase in the saving rate though the steady state position has moved to the right.

Two points are worth noting here. First, though long-run growth rate of the economy remains the same as a result of increase in the saving rate, capital per head ($k$) and income per capita ($y$) have risen with the upward shift in the saving curve to $s'y$ and consequently the change in steady state from $T_0$ to $T_1$, capital per head has increased from $k^*$ to $k^{**}$ and income per head has risen from $y^*$ to $y^{**}$.



However, it is important to note that in the transition period or in the short run when the adjustment process is taking place from an initial steady state, to a new steady state a higher growth rate in per capita income is achieved. Thus, in Figure 41.3 when with the initial steady state point $T_0$, saving rate increases and saving curve shifts upward from $sy$ to $s'y$, at the initial point $T_0$, planned saving or investment exceeds $(n + d)\ k$ which causes capital per head to rise resulting in a higher growth in per capita income than the growth rate in labour force ($n$) in the short run till the new steady state is reached.

The effect of increase in saving on growth in output or income per head ($y$) and growth rate of total output $\left(i.e., \frac{\Delta Y}{Y}\right)$ is shown in Figure 41.4 the upper panel (a). Figure 41.4 shows the growth in output (income) per head as a result of increase in the saving rate. To begin with, the economy is initially in steady state equilibrium at time $t_0$ with output per head equal to $y^*$. The increase in saving rate causes capital per head to rise which leads to the growth in output per head till time $t_1$ is reached. At time $t_1$ the economy is again in steady state equilibrium but now at a higher level $y^{**}$ of output per head. Note that in the transition persued from $t_0$ to $t_1$, output per head increases but at a diminishing rate

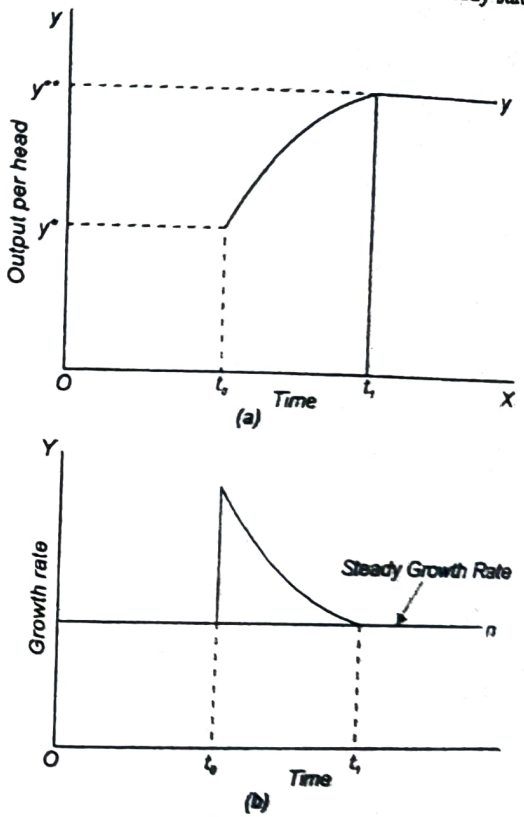


Fig. 41.4

The lower panel (b) Figure 41.4 (*b*) illustrates the adjustment in growth rate in total output $\left(i.e., \frac{\Delta Y}{Y}\right)$. It will be seen from lower panel (b) of Figure 41.4 (*b*) that starting from initial steady state at time $t_0$ the increase in saving rate and capital formation leads to growth rate in total output higher than the steady growth rate $n$ in the period from $t_0$ to $t_1$ but in period $t_1$ it returns to the steady growth rate path $n$. It is thus evident that the higher saving rate leads to a higher growth rate in the short run only, while *long-run growth rate* in output remains unaffected. *The increase in the saving rate raises the growth rate of output in the short run due to faster growth in capital and therefore in output.* As more capital is accumulated, the growth rate decreases due to the diminishing returns to capital and eventually falls back to the population or labour force growth rate ($n$).

**Effect of Population Growth**

For developing countries like India it is important to discuss the effect of increase in population growth rate on steady levels of capital per head ($k$) and output per head ($y$) and also on the steady-state rate of growth of aggregate output. Figure 41.5. illustrates these effects of population growth. An increase in population growth rate causes an upward shift in $(n + d)\ k$ line. Thus in Figure 41.5,

the increase in population growth rate from $n$ to $n'$ causes upward shift of $(n + d)\,k$ to $(n' + d)\,k$ curve dotted. It will be seen from Figure 41.5 that the new $(n' + d)\,k$ curve cuts the given saving curve $sy$ at point $T'$ at which capital per head has decreased from $k^*_1$ to $k^*_2$ and output per capita has fallen from $y^*_1$ to $y^*_2$. This can be easily explained. Due to higher growth rate of population a given stock of capital is spread thinly over labour force which results in lower capital per head (*i.e.* capital-labour ratio). Decrease in capital per head causes decline in per capita output. *This is an important result of neoclassical growth theory which shows that population growth in developing countries like India impedes growth in per capita income and therefore multiplies their efforts to raise living standards of the people.*

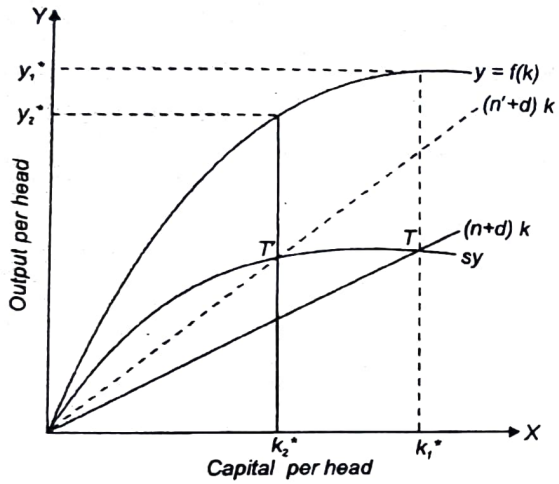


**Fig. 41.5** *Effect of Population Growth Rate on Capital Per Head, Output Per Head, and Steady Growth Rate*

Figure 41.5 also shows that higher growth rate of population raises the steady-state growth rate. It will be seen from this figure that increase in population growth rate from $n$ to $n'$ causes $(n + d)\,k$ curve to shift upward to the new position $(n' + d)\,k$ (dotted) which intersects the saving curve at new steady-state equilibrium point $T'$. The steady state growth rate has therefore risen to $n'$, that is, equal to the new growth rate of population. It may however be noted that *higher steady rate of growth* is not a desirable thing. As a matter of fact, a *higher steady growth means that to maintain a certain given capital-labour ratio and per capita income the economy has to save and invest more.* This implies that a higher rate of population acts as an obstacle to raise per capita income and therefore living standards of the people. Thus, this result provides a significant lesson for the developing countries like India, that is, if they want to achieve higher living standards for its people they should make efforts to control population growth rate.

**Long-run Growth and Technological Change**

Let us now analyse the effect of technological change on long-run growth of an economy. It is important to note that neoclassical growth theory considers technological change as an *exogenous variable*. By exogenous technological change we mean it is determined outside the model, that is, it is independent of the values of other factors, capital and labour. That is why neoclassical production function is written as

$$Y = AF\,(K,L)$$



where $A$ represents exogenous technological change and appears outside the bracket.

In the foregoing analysis of neoclassical growth theory for the sake of simplification we have assumed that the technological change is absent, that is, $\frac{\Delta A}{A} = 0$. However, by assuming zero technological change we ignored the important factor that determines long-term growth of the economy.

We now consider the effect of *exogenous technological improvement* over time, that is, when $\frac{\Delta A}{A} > 0$ over time.

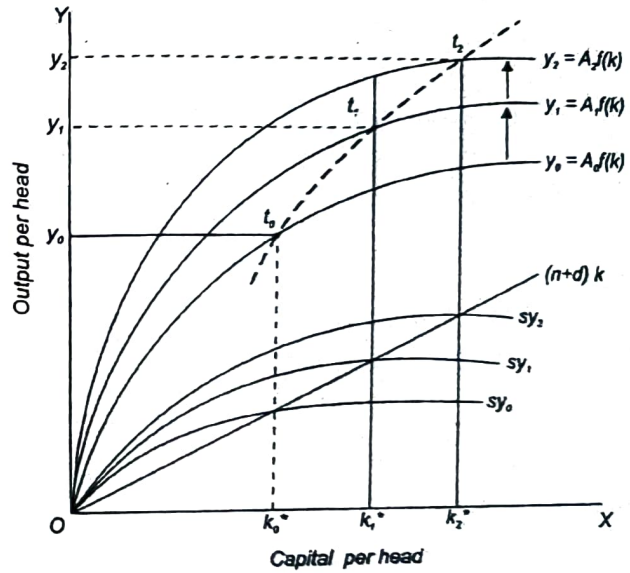


**Fig. 41.6.** *Growth in Capital Per Head and Output Per Head with Exogenous Technological Change*

The production function (in per capita terms), namely, $y = Af(k)$ considered so far can be taken as a snapshot in a year in which $A$ is treated to be equal to 1. Viewed in this way, if technology improves at the rate of 1 per cent per year a snapshot taken in a year later will be $y = 1.01\,f(k)$, 2 years later, $y = (1.01)^2 f(k)$ and so forth. As a result of this technological change production function will shift upward. In general, if technological improvement $\frac{\Delta A}{A}$ per year is taken to be equal to $g$ per cent per year, then production function shifts upward at $g$ per cent per year as shown upper part in Figure 41.6 where to begin with production function curve in period $t_0$ is $y_0 = A_0 f(k)$ corresponding to which saving curve is $sy_0$. With this, in steady state equilibrium, capital per head is equal to $k^*_0$ and output (income) per head is $y_0$. With $g$ per cent rate of technological progress in period $t_1$, production function shifts to $y_1 = A_1 f(k)$ and correspondingly saving curve in the lower part of Fig. 41.6 shifts upward to $sy_1$. As a result in period $t_1$, in new steady state equilibrium capital per head rises to $k^*_1$ and per capita output to $y_1$. With a further $g$ per cent rate of technological progress in period $t_2$, production function curve shifts to a higher level, $y_2 = A_2 f(k)$ and associated saving curve shifts to $sy_2$. As a result, capital per head rises to $k^*_2$ and per capita output to $y_2$ in period $t_2$. We thus see that progress in technology over time causes growth of per capita output (income). With this

# Questions

1/10 - Discuss the classical Theories of Economic growth. whether they Those applicable today a days Support your Answer.

2/10 Discuss the Marxian Theory of Economic growth. Discuss the Relevance of the Theory to developing Countries.

3/10 "Innovation is Important Determinant of Economic growth" Discuss.

4/10 Discuss the Rostow's Stages of Economic growth. In which Stages of Economic growth or Rostow today India.

5/10 Discuss the convergence in Solow model of Economic growth with respect to population growth and Technical progress.

# 7

# The Classical Theory

## INTRODUCTION

ECONOMIC development is not a new concept. Over the years in the pa social scientists have been concerned with economic development, but the did not evolve a systematic theory of economic growth. The Mercantilists di much to augment the material growth of a nation by various economic an political measures. The Physiocrats attacked them for the narrowness of the definition of wealth and for assigning a pivotal role to government. The Physio crats themselves lacked the idea of social progress and formulated general laws It was, however, Adam Smith who "addressed himself to the general problem of how to create a social and political framework that would encourage sustained economic growth." For this he advocated removal of all governmental restric tions so as to permit greater specialization and expansion of markets. Smith's successors, Ricardo, Malthus and Mill continued to concern themselves with the problems posed by the former though they narrowed the scope of their enquiries.

## THE CLASSICAL MODEL

The classical model[1] can be briefly explained as follows.

**Laissez-faire Policy.** The classical economists believed in the existence of an automatic free market perfectly competitive economy which is free from any government interference. It is the "invisible hand" which maximises the national income.

**Capital Accumulation the Key to Progress.** All classicists regard capital accumulation as the key to economic progress. They therefore lay emphasis on larger savings. Only capitalists and landlords are capable of saving, according to them. The working class is incapable of saving because it gets wages equal to the subsistence level.

**Profit the Incentive to Investment.** According to the classicists, profit induces investment. The larger the profit, the greater the capital accumulation and investment.

**Tendency of Profits to Decline.** Profits do not increase continuously. They tend to decline when competition increases for larger capital accumulation among capitalists. The reason, according to Smith, is increase in wages due to competition among capitalists. Whereas, according to Ricardo, when wages and rent rise with the increase in the price of corn, profits decline.

[1]For a detailed analysis study the Smithian and Ricardian Models.





**Stationary State.** All classical economists visualize the stationary state at the end of the process of capital accumulation. When once profits start declining, this process continues till profits become zero, population and capital accumulation stop increasing and the wage rate reaches the subsistence level.

Malthus established a unique co-relation between population growth and food supply. According to him, if the growth of population were left uncontrolled, it would outrun the growth of capital and hence the means of subsistence. Both Ricardo and Malthus saw a growing population and a declining growth of capital through the operation of the law of diminishing returns, as ultimate checks to economic development.

In broad outline, the classical model of economic development may be stated thus: Suppose an expected increase in profits brings about an increase in investment which adds to the existing stock of capital and to the steady flow of improved techniques. This increase in capital accumulation raises the wages fund. As a result wages rise. Higher wages induce an accelerated population growth which causes the demand for food to rise. Food production is raised by employing additional labour and capital. But diminishing returns to land bring about a rise in labour cost. Consequently, the price of corn goes up and in turn rents increase, wages rise, thereby reducing profits. Reduction in profits implies reduction in investment, retarded technological progress, diminution of wages fund and slowing down of population growth and capital accumulation. "In the classical model, the end result of capitalist development is stagnation.....This stagnation resulted from the natural tendency of profits to fall and the consequent choking off of capital accumulation."[2] When this happens, capital accumulation ceases, population becomes constant and the stationary state sets in.

The classical model is explained in terms of the adjoining figure where time is taken on the horizontal axis and rate of capital accumulation, $\frac{dk}{dt}$ on the vertical axis. The economy grows from $K$ to $S$ during the time path $t$. After $t$, the economy reaches the stationary state linked to $S$ where further growth does not take place because rent rises so high that profits become zero and capital accumulation stops.

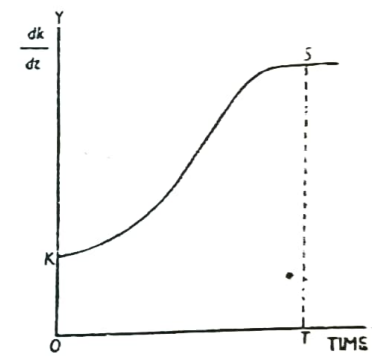


Fig. 8.1

### A Critical Appraisal

This simple and abstract classical model of development is not free from criticisms.

1. **Ignores Middle Class.** The whole classical analysis was based on the socio-economic environment prevailing in Great Britain and certain parts of

[2]B. Higgins, *op. cit.*, pp. 87-98.