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Institute of Distance and Open Learning
Gauhati University

M.A./M.Sc. in Economics
Semester III

Paper IX
Development Economics- I

Contents:

MA/M.Sc. Economics
Institute of Distance and Open Learning
GAUHATI UNIVERSITY

COURSE STRUCTURE

A student shall do a total number of sixteen papers in the four Semesters. Each paper will carry 100 marks - 20 marks for internal evaluation during the semester and 80 marks for external evaluation through end semester examination. All the papers in the First, Second and Third Semesters will be compulsory. The paper XIII and XIV of the Fourth Semester will also be compulsory. The remaining two papers for the Fourth Semesters will be chosen by a student from the optional papers. The names and numbers assigned to the papers are as follows.

First Semester

I Microeconomics Theory
II Macroeconomics Theory - I
III Mathematical Methods for Economic Analysis-I
IV Statistical Methods for Economic Analysis

Second Semester

V Advanced Microeconomics
VI Macroeconomic Theory -II
VII Mathematical Methods for Economic Analysis-II
VIII Elementary Econometrics

Third Semester

IX Development Economics-I
X International Economics
XI Issues in Indian Economy
XII Public Finance-I

Fourth Semester

XIII Development Economics-II
XIV Public Finance-II

Papers XV and XVI are optional

A student has to choose any two of the following courses.

(a) Population and Human Resource Development
(b) Econometric Methods
(c) Environmental Economics
(d) Financial System

Detailed Contents of this Paper

Paper - IX
DEVELOPMENT ECONOMICS- I

Unit – 1: Development and Undervelopment-An Overview

Problems in Defining Economic Development — Per Capita Income as an Index of Development – Alternative Measures of Development Gap: HDI, GDI Including new concepts) and related indices. Poverty: Concepts and Measurement - Income Inequality and Growth – Redistribution with Growth

Unit-2: Theories of Economic Growth

Classical Apparoach-Adam Smith and Ricardo – The Theory of Marx.-Schumpeter's Analysis,

Harrod-Domor Model: Instability of Equilibrium – Solow's Neoclassical Model and Steady State Growth – Role of Technical Progress – Convergence – Role of Human Capital – Endogenous Growth – Alternative Growth Model: Joan Robinson and Kaldor

Unit – 3: Theories of Development

The Vicious Circle Theory – The Process of Cumulative Causation: Myrdal – Neo-Colonial Dependence Model. The Stages of Growth: Rostow – Big Push: Rosenstein – Rodan – Balanced Growth: Nurkse – Unbalanced Growth: Hirschman – Critical Minimum Efforts: Leibenstein.

Unit – 4: Development from Dual Economic Structure

Unlimited Supply of Labour and The Dual Economy Models of Lewis and Fei-Renis – The Harris–Todaro Model.

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Unit 1
Development and Underdevelopment - An Overview

Structure :

1.0 Introduction :

This unit tries to give the distinction between economic development and economic growth. It evaluates per capita income as an index of development and extends on to discussing other alternative measures of the development gap. Besides it tries to give the concepts of poverty and the ways of measurement and the re-distribution with growth.

1.1 Objectives :

On reading this unit students should be able to–

- Distinguish between the concepts of economic growth and development.
- Comprehend the limitations of per capita income as an index of development.
- Have an idea about the alternative indicators of the development gap.

1.2 Concepts of Economic Growth and Development :

Growth and development, sometime these two terms are used synonymously. But the two concepts are contrasting.

The term economic growth is designated to an increase in output. More precisely economic growth refers to a sustained increase in country's output or per capita income. However, the term economic development is a more comprehensive term. Besides growth, economic development involves progressive changes in the socio-economic structure of country. This implies a steady decline of agriculture's share in GNP and increase in the shares of other sectors like industries, trade, banking etc, accompanied by a change in occupational structure. Economic development also means structural changes in the institutions and organizations, change in the national output mix, reallocation of resources and reduction in poverty, inequalities and unemployment.

Thus, on one hand economic growth refers to increase in output, whereas on the other hand development is growth plus change.

1.3 Problems in Defining Economic Development :

In present times economic development is not considered as an end in itself but a means to achieve higher and better objectives. However, the term development may mean different things to different people so, some working definition has been developed to give a core perspective on its meaning. Accordingly two main viewpoints evolved First, the traditional view of development and second, the new economic view of development.

Traditional View of Development :

It defines development strictly in economic terms. Traditionally economic development implies a sustained increase in the grass national product (GNP) of an economy at 5% to 7% or more. In the past, economic development has been in terms of planned alteration of the structure of production and employment. It implies a decline in argiculture's share in both production and employment and that of the manufacturing and service industries increases. Development strategies often suggested are those emphasing on rapid industrialization at the expense of agriculture and rural development. It was therefore viewed that rapid gains in overall and per capita GNP growth would 'trickle down' to the masses either in form of jobs and other economic opportunities or would create wider distribution of the economic and social benefits of growth.

The New Economic View of Development – In the 1950s and 1960s many of the developing nations did realise their economic growth targets but the living conditions of the general masses remained unchanged. It was indicative of the fact that there was something wrong with the narrow definition of development. So many economists stressed on the "dethronement of GNP". Consequently, economic development was redefined in terms of reduction of poverty, inequality and unemployment. Re-distribut from growth was what became a popular slogan.

In 1960s and 1970s a number of developing countries experienced relatively high rates growth in per capita income on one hand, but showed little or no improvement in poverty inequality, unemployment and real incomes of the bottom 40% of their population. By earlier definitions of development these countries were developing but in terms of the new criteria of development they were not.

Even the World Bank in 1980s stressed on economic growth as the goal of development. In 1991 the World Development Report asserted that the challange to development is to improve the quality of life, more specifically in the world's poorer nations.

Thus, development has to be conceived as a multi dimensional process involving major changes in social structures, attitudes of the people and national institution as well as reduction of inequality and eradication of poverty. Thus, development signifies a situation where the society moves from an undiserable to desirable change.

Check your progress :

1. Distinguish between economic growth and development.
2. Distinguish betwen the traditional and new economic view of development.

1.4 Per Capita Income as an Index of Development :

Per capita income is commonly used as an index to measure the rate of development overtime. Besides it also classifies countries into rich and poor. In the less developed countries, economic growth was considered as a solution of all economic ills. In terms of per capita income as an indicator, development is said to take place if the rate of growth of national income exceed the rate of growth of population.

The reasons for favouring this index are as mentioned below :

First, although per c apita income is an average, it is representative of the fact that a country as a whole is getting better off. A rising average means an increase in the per head availability of goods and services.

Second, it focuses the development on the poverty of the mass of the people. In less developed countries development can have no meaning unless the population growth is taken care of.

Third, this index is also helpful in comparing the living standards among countries. Besides it is also useful in comparing their performances.

Per capita income as an index of development is useful, but not without limitations. There are some criticisms levelled against it.

First, the per capita income figure indicates nothing about the types of goods and services produced in a country. Therefore, it fails to measure the welfare dervied from the consumption of such goods and services and also the cost involved with increase in per capita income.

Second, Many goods and services donot pass the market and are thus not included in the national income estimates. For instance, unpaid family labour or services done out of love or self-repcirs are not considered as production and are therefore not included in per capita national income.

Third, national income estimates and the rate of increase in it indicates nothing about the exploitation and waste of natural resources involved.

Besides, an increase in national income always not necessarily mean equitable ditribution. A major portion of national production may be pocketed by a smaller segment of the population.

Moreover, per capita income figures cannot always be used for comparing economic welfare amongst different countries. Estimates of national income especially in less developed countries present enormous problem in form of bias and choice of price deflators, illiteracy, absenceof reliable data and presence of large rural subsistence sector.

Again, the relative price structures are not the same in all countries. It poses as a difficulty in making meangful comparisons of the per capital national income in different countries.

However, with all these weaknesses of per capita income as an index of development, perhaps it is still the best indicator of development we have. This is because a rise in per capita income indicates an enhancement in living standards of the general masses and reduction of poverty, which is what development means.

1.5 Alternative Measures of Development Gap :

The deterioration in economic conditions of the bulk of population in less developed contries despite some growth resulted in the search for an alternative to GNP or per capita income as an index of development. The led to the formulation of non-income indices of development by economists. Morris D. Morris developed the concept of Physical Quality Life Index (PQIL) while economists like Paul Streeten advoated the edoption of Basic needs approach. The attempts finally paved way for the Human Development Index (HDI) introduced by UNDP in its first Human Development Report (HDR) prepared under the guidance of Mahbub ul Haq in 1990. The measure has been enlarged and many related indices of human development like Gender-Related Development Index (GDI), Gender Empowerment Measure (GEM), Human Poverty Index (HPI) were developed in the subsequent Humand Development Reports, by UNDP.

1.5.1 Physical Quality Life Index :

Morris D. Morris developed a composite index of three elements, namely, the life expectancy, the infant mortality and literacy.

Figures for each indicator, the performance of different countries are rated in a scale of 1 to 100; 1 representing the worst case and 100 the best case. The PQLI index will be highest at 100 for a country with the most favourable life expectancy, the lowest infant mortality and the highest literacy in the world. Similarly the index will be the lowest at one for a country with the most unfavourable life expectancy, the highest infant mortality and the lowest literacy. Between these two extremes the other countries would be ranked depending on their respective PQLI.

A country ranking high on this index means that a large number people have gained in terms of physical quality of life. And if the PQLI, is rising in the subsequent years, the physical quality of life is improving. However, a country with high per capita income doesnot necessarily rank higher in the PQLI.

For eg- In the seventies, USA with a high per capita national income had PQLI at 96, so against this, Netherlands with per capita income although not as high as USA score a higher ranking with 99 in PQLI. In similar way, Sweden had PQLI at 100, with life expectancy at 75, the highest in the world, infant mortality at 9, the lowest in the world, and literacy at cent percent, but its PCI was lower relative to the USA.

Thus, if a country works for the development of its downtrodden people PQLI would improve, even if it has a low per capita income. PQLI is a better of development because it states development in terms of the three indicators and reflects overall development.

However, this index faces hurdles when applied to countries with vast and rapidly rising population. In such countries per capita incomes are usually low and a very little can be spared for improvement in terms of the components of PQLI. Non income indices like PQLI can be useful o when in combination to per capita income index.

1.5.2 Basic Needs Approach :

The experience of many countries especially the Third World countries has shown that m increase in the per capita income is not a sufficient condition for rapid progress in meeting ba needs. Their experience confirms that poverty can co-exist with high degree of equalty. S eradication of absolute poverty, particularly by meeint the basic human needs was emphasised.

A set of indicators is required to measure the degree of deprivation in any society to fulfil th objective of meeting basic human needs. Social indicators are broadly of two types– input indicators and output indicators. The essential basic needs cover sixareas : heath, basic education, nutrition, water supply, sanitation and housing.

Hicks and streeten considered the following indicators representative of the essential basi needs :

Basic Needs		Indicators
Heath	–	Life Expectancy at birth
Education	–	Literacy, Primary school enrolment (as percent of population aged 5-14 years)
Nutrition	–	Calorie supply per head.
Water supply	–	Infant mortality (per '000 births) & percent of population with access to potable water
Sanitation	–	Infant mortality (per '000 births) percent of population with access to sanitation facilities.
Housing	–	None.

Of all these core indicators, except calorie supply per head, rest of the indicators are output ndicators.

These needs are minimum basic requirements and is just a fair representation of the most basic ieeds of people. These needs may differ from society to society depending upon the level of levelopment, culture of a society etc.

But to conclude, this approach is concerned with the removal of absolute poverty through the direct provision of goods and services to the unprevilaged people.

1.5.3 Human Development Index :

The Human Development Report, 1990, defined human development as a process of enlarging people's choices. It includes an opportunity to lead a long and healthy life, to be educated and to enjoy a decent standard of living. Besides, other choices include political freedom, other guaranted human rights and various ingredients of self respect.

Human development paradigm thus embraces the entire society not just the economy. The political, cultural and social factors are of equal importance as the economic factors.

Essential Components of Human Development–

According to Mahbub-ul-Haq, there are four essential Components in the human development paradigm– equity, sustainability, productivity and empowerment.

Equity : If development means enlargment of people's choices, people must enjoy equitable access to opportunities. These opportunities may be in the form of redistribution of income, equalisation of political rights, removal of social and leval barriers etc.

Sustainability : The next generation deserves the opportunity to enjoy the same rights as we do now. So, it requires sustaining of human, capital an environmental opportunities. Sustainability is a matter of distributional equity which requires sharing of opportunities between present and future generations ensuring both intragenerational and intergenerational equity in access to opportunities.

Productivity : It is an essential part of human development paradigm, which requires investments in people so as to enable them with a macroeconomic environment to achieve their maximum potential.

Empowerment : Empowerment implics that people are in a position to exercise choices out of their own free will. It requires investment in education and health of the people so that they can take advantage of market-opportunities. Besides, it also requires an environment which gives people access to credit and productive assets. And most importantly it requires empowerment of both women andmen so that they can compete on an equal footing.

Thus, human development is 'end' of all activity and economic growth is just a means towards this end. However, measurement of human development is not an easy task. A search for a comprehensive measure to capture the various dimesions of human development led to the formulation of Human Development Index (HDI) by the United Nations Development Programme (UNDP) it its Human Development Report, 1990. HDI has ben re-directing our focus from one set of elements to other. HDI doesnot replace GNP but adds to our undrstanding of our real position in the society.

HDI is a composite measure of three basic indicators of human development–

1. Longevity – measured by life expectancy at birth.
2. Eduation – measured by mean years of schooling and expected years of schooling.
3. Standard of living – measured by real (GNP) gross national income per capita (ppp in dollars)

For the construction of the HDI, maximum and minimum values have been established for each indicator. The maximum values are the set of actual observed values and the minimum values are based on historical evidence. In 2010 HDR, the methodology of computing HDI has changed although the dimesions are the same. Previously HDI was measured as the arithmetic mean of t' three dimenson indices. But according to 2010 HDR, HDI is measured as the geometric mean the dimension indices, measuring human development.

Indicators	Minimum Value	Maximum Valu
Life Expectancy at Birth	20	83.2
Mean Years of Schooling	0	13.2
Expected Years of Schooling	0	20.6
Combined Education Index	0	0.951
GNP (ppp$)	$163	$108,211

For any component of the HDI, individual indices are calculated according to the general formula :

$$\text{Dimension Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}}$$

Then the HDI is calculated as a geometric mean of the three normalised indices measuring human development as–

$$\text{HDI} = \sqrt{(\text{lif. exp})^{\frac{1}{3}} . (\text{Edu})^{\frac{1}{3}} . (\text{Income})^{\frac{1}{3}}}$$

$$= 3\sqrt{\text{life ex. Edu. Income}}$$

To illustrate the calculation of HDI, let us consider an eg of a country– China where–

Life Expectancy at birth (years)	–	73.5
Mean Years of schooling	–	7.5
Expected Years of Schooling	–	11.4
GNP (ppp us $)	–	7263

Dimension Indices are–

$$\text{Life Expectancy} = \frac{73.5-20}{83.2-20} = 0.847$$

$$\text{Mean years of schooling} = \frac{7.5-0}{13.2-0} = 0.568$$

$$\text{Expected years of schooling} = \frac{11.4-0}{20.6-0} = 0.553$$

$$\text{Combined Education Index} = \sqrt{\frac{0.568 \times 0.553 - 0}{0.951-0}}$$

$$= 0.589$$

$$\text{Income Index} = \frac{7263-163}{108211-163} = 0.584$$

$$\therefore \text{HDI} = \sqrt[3]{\text{Lif Exp) (Com. Edu. Index) (Income Index)}}$$

$$= 0.847 \times 0.589 \times 0.584$$

$$= 0.663$$

The 2010 HDR also introduced a concept of Inequality Adjusted Human Development Index (IHDI). It captures the loss in human development due to inequality in health, education and income IHDI takes into account the distribution of the three dimensions. The difference between HDI and IHDI measures the loss due to inequality.

Check Your Progress :

1. What the non-income indices?
2. State the components of PQLI?
3. What do you mean by human development?
4. What is HDI?

1.5.4 Gender Related Development Index :

While the HDI measures the achievements, the GDI adjusts the achievements to reflect the inequalities between men and women in the same dimensions, viz. longevity, education and standard of living. The gender related development index (GDI) was introduced in Human Development Report 1995 and it adjust the HDI for gender inequality.

The calculation of GDI involves the following three steps–

First, female and male indices in each dimension is calculated according to the general formula–

$$\text{Dimension Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}}$$

Second, the female and male indices in each dimension are combined in a way that penalizes differences in achievement between men and women. The resulting index, referred to as the equality distributed index and is calculated as–

$$\text{Equality distributed Index} = [\{\text{female population share (female index)}^{1-E}\} + \{\text{male population share (male index)}^{1-E}\}]^{1/1-E}$$

It measures the aversion to inequality. In the GDI E = 2. Thus the general equation becomes–

$$\text{Equally distributed index} = [\{\text{female population share (female index)}^{-1}\} + \{\text{male population share (male index)}^{-1}\}]^{-1}$$

This is nothing but the harmonic mean of the female and male indices.

Third, the GDI is calculated by combining the three equally distributed indices in an unweighted average.

For calculating GDI maximum and minimum values are fixed for each indicator–

Indicator	Maximum Value	Minimum Value
Female life expectancy at birth (years)	87.5	27.5
Male life expectancy at birth (years)	82.5	22.5
Adult literacy rate (%)	100	0
Combined gross enrolment ratio (%)	100	0
Estimated earned income {ppp (us$)	40,000	100

The greater the gender disparity in basic human development, the lower a country's GDI compared with its HDI. The HDR 2007/2008 presented GDI for 157 countries, of which Iceland

tops the list, followed by Australia and Norway. Several developing countries like Poland (35), Argentina (36), etc did well in the GDI rankings. These countries succeeded in enhancing the basic human capabilities of both men and women. The bottom five countries of GDI are the countries where women faces double deprivation.

1.5.5 Gender Empowerment Measure :

The gender empowerment measure (GEM) was also introduced in the Human Development Report 1995. It focuses on women's opportunities rather than their capabilities. It indicates whether women are able to actively participate in economic and political life. GEM captures inequality in three key areas–

- Political participation and decision making, measured by women's and men's percentage shares of parliamentary seats.
- Economic Participation and decision making power, as measured by two indicators–
  ⇒ Women's and men's percentage share of positions as legislators, senior officials and managers.

& ⇒ Women's and men's percentage shares of professional and technical positions.

- Power over economic resources, as measured by women's and men's estimated earned income (PPP US $).

For each of these dimensions an equally distributed equivalent percentage (EDEP) is calculated, as a population weighte average. The general formula is–

$$EDEP = [\{\text{female population share (female index)}^{1-\varepsilon}\} + \{\text{male population share (male index)}^{1-\varepsilon}\}]^{1/1-\varepsilon}$$

ε is a measure to the aversion to inequality.

$\varepsilon = 2$, which places a moderate penalty on inequally and thus the formula becomes–

$$EDEP = [\{\text{female population share (female index)}-1\} + \{\text{male population share (male index)}-1\}]-1$$

For, political and economic participation and decision marking, the EDEP is indexedby dividing it by 50. This is done because in an ideal society, with both male and female equally empowered, the GEM variables would be 50% indicating equal share for both men and women in each variable.

According to HDR 2007/2008, the GEM for 93 countries the top four positions were held by– Norway, Sweden, Finland and Denmark respectively in order. Many developing countries outperformed many developed industrial countries. These countries not only strengthned the basic capabilities of women, but also opened many opportunities for them for economic and political participation. Countries with GEM below .300 indicates that thse countries have a long way to go in women's opportunities and development.

1.5.6 Gender Inequality Index (GII) :

The 2010, Human Development Report introduced a new concept known as the Gender Inequality Index (GII). It captures the distribution of well-being regarding gender equity. Disadvantages facedby women and girls are major source of inequality in the society. Women and girls are discriminated in health, education and living standards with negative repercussions on their freedom. GII was introduced to expose the difference and inequality between men and women. It reflects disadvantages facing women in three dimensions–

- Reproductive Health
- Empowerment
- Labour market.

GII shows the loss in human development due to inequality between females and males in these three dimensions. GII ranges between 0 and 1. 0 represents that both males and females fairs equally and 1 represents that females fair inequally as their male counter parts.

Reproductive Health :

It is the largest contributor to gender inequality. Two indicators are used to measure reproductive health–

- Maternal Mortality Rate (MMR) and
- Adoloscent Fertility Rate

Well-being during and after child-birth sends a clear message about a womens standard in the society. The risk of child birth can be reduced through basis education, nutrition and proper access to anti-natural care. These services are cheap and easily available but even today women are denied of these service in many parts of the world. Besides girls are married away at a very early and tender age. Reproduction therefore at such an age is not only risky but also limits women's accers to education and states in the society.

Empowerment : The ratio of female to male representatives in the parliament is used to capture this disadvantage facing women. Traditionally, women are disadvangaged in the political arena at all levels of government. Use of female to male representative in the parliament reflects women's feasibility in political leadership and also society. The global average is as low as about. 16% although women's participation in political areana has been at rise in the recent times. In 2008, Rwandas parliament became the first to have majority of women although in terms of HDI it was ranked at 158. Higher educational attainment expands women's freedom, their capacity to question reflect and access information and can better enjoy their rights and freedom.

Labour Market : Labour force participation includes both employed and unemployed looking

for work. In 2008 the labour for participation staghated at 51% globally.

The all index shows that gender inequality varies tremendously across countries. According to Human Development Report 2010, Netherlands is the most gender equal country followed by Denmark, Swedend and Switzerland. Gender inequality is a very actual case of humen development. Apart from education women fairs poorly in other indicators viz. health and standard of living. This is quite evident from the sex ratio. Infact there are 134 million missing women in the world in 2010. This is due to acute gender bias especially in developing countries. Earlier the case was of female inequality. But now it is case of natality inequality. But now it is case of natality inequality i.e girls are not even allowed to be born.

Check Your Progress :

1. What does gender related development index measure.
2. What is GEM?
3. What does GII captures?

1.6 Poverty Analysis :

There is no common definition of poverty which can be broadly accepted everywhere. However, it may be defined as a social phenomenon where a section of the society is unable to fulfill even its basic necessities of life. In a country, where a large portion of the population fuces deprivation even from the minimum amenities of life for a considerable amount of long period, the country is said to suffer from vicious circle of poverty. The third world countries exhibit mass poverty; but pockets of poverty exist even in the developed countries. Therefore elemination of poverty should be given the highest priority. Poverty can essentially be of two types– the absolute and the relative.

Absolute poverty is defined as a person's lack of command over resources even to obtain the basic necesscities of life. On the otherhand, relative poverty reflects the degree of inequality in the distribution of income in a country.

However, poverty in terms income gives only a partial picture. Poverty when analysed in terms of deprivations and not just income can give a clear picture how poverty manifests itself. This leads to the concept of 'human poverty' which is nothing but denial of choices and opportunities for living a tolerable life.

So, the Human Development Report 1997 introduced the concept of human poverty index (HPI) in an attempt to bring together in a composite index of deprivations in the basic human development in the same dimensious as HDI.

1.6.1 The Human Poverty Index for developing countries (HPI-1) :

While th HDI measures achievements, the HPI-1 measures deprivations in the three basic dimensions of human development captures by HDI :

- A long and healthy life– Vulnerability to death at a relatively early age, as measured by the probability at birth of not surviving to age 40.
- Knowledge– exclusion from the world of reading and communications, as measured by the adult illiteracy rate.
- A decent standard of living– lack of access to overall economic provisioning, as measured by the unweighted average of two indicators : – the percentage of people without sustainable accers to a improved water source and the percentage of children under weight for age.

The measure of deprivation in a decent standard of living also included an indicator of access to health serices. But due to lack of reliable data on access to health services the deprivation in a decent standard of living was measured by two rather than three indices.

Calculating HPI-1

It involves two steps–

1. Measuring deprivation in a decent standard of living.
2. Calculating the HPI-1.

The deprivation in a decent standard of living is an unweighted average of two indicators, namely, population without sustainable access to an improved water source and children under weight for age i.e.–

$$\text{Unweighted average} = \frac{1}{2}\,(\text{population without sustainable access to an improved water source}) + \frac{1}{2}\,(\text{children under weight for age})$$

Then the HPI-1 is calcuted with the following formular–

$$\text{HPI-1} = \left[\tfrac{1}{3}\left(P_1^{\alpha} + P_2^{\alpha} + P_3^{\alpha}\right)\right]^{\frac{1}{\alpha}}$$

where,

P_1 = Probability at birth of not surving at age 40 (times 100)

P_2 = Adult illiteracy rte

P_3 = Unweighted average of population without sustainable access to an improved water source and children under weight for age.

$\alpha = 3$

.6.2 The Human Poverty Index for selected OECD countries HPI-2

The HPI-2 measures deprivation in the same dimensional as the HPI-1. Besides it also captures ›cial exclusion. Thus it reflect deprivations in four dimesions–

A longand healthy life – Vulnerability to death at a relatively early age, as measured by the probability at birth of not surviving to age 60.

Knowledge – exclusion from the world of reading and communications, as measured by the percentage of adults (ages 16-65) lacking functional literacy skills.

A decent standard of living – as measured by the percentage of people living below the income poverty line (50.1 of the median adjusted household disposable income).

Social Exclusion – as measured by the rate of long term unemployment (12 months or more).

:alculating HPI-2 –

The HPI-2 is calculated with the help of the following formula–

$$\text{HPI-2} = \left[\frac{1}{4}\left(P_1^{\alpha} + P_2^{\alpha} + P_3^{\alpha}\ P_4^{\alpha}\right)\right]^{\frac{1}{\alpha}}$$

where,

P_1 = Probability at birth of not surviving at age 60 (times 100)

P_2 = Percentage of adults lacking functional literacy skills.

P_3 = Percentage of population below income poverty line.

P_4 = Rate of long-term unemployment (lasting 12 months or more).

$\alpha = 3$

.6.3 Multidimensional Poverty Index : (MPI)–

The MPI was introduced in the Human Development Report 2010. It identifies multiple leprivations at individual level at health, education and standard of living. The MPI uses micro data rom household Surveys. Each person in a given household is classified as poor or non-poor lepending on the number of deprivations that his household experiences. This data is then ıggregated to the national measure of poverty.

Each person is assigned a score in each of 10 component indicators (d). Each dimensions are equally weighted and the maximum score assigned is 10. So, each component has $3\frac{1}{3}$ weights.

Out of the 10 indicators health has 2 indicators, education is assigned another 3 indicator and tandard of living another 6 indicators. Each component in health and education is worth $5/3$ or 1.67 and standard of living is worth $5/9$ or 0.56.

1. Health has two indicators–
   (a) having atleast one household member who is malnourished.
   (b) having one or more children die.
2. Education has two indicators as–
   (a) having no household member who has completed 5 years of schooling.
   (b) having atleast one school-age child (upto grade 8) who is not attending school.
3. Standard of living has six indicators as–
   (a) no electricity.
   (b) no access to clean drinking water.
   (c) no access to adequate sanitation.
   (d) using dirty cooking fuel (dung, wood or charcoal).
   (e) owning no car or similar motorized vehicle.
   (f) owning at most one of these assets– bicycle, motorcycle, radio, freeze, TV or telephone.

To identify the multidimensionally poor the deprivation of household score is cummed to obtain the household deprivation 'C'. A cutoff of 3, which is $\frac{1}{3}$rd of the indicators is used to distinguish between poor and non-poor.

If C is greater than or equal to 3 (i.e. $C \geq 3$) than a household is multidimensionally poor. And if a household is between 2 and 3 than it is vulnerable to being poor.

The MPI is than calculated as a porduct of 2 measures, viz. the head count ratio and the intensity of poverty.

Head count ratio (H) is the proportion of population which are multidimensionally poor.

$$\therefore H = q/n$$

where q = number of people who are multidimensionally people.

n = total population.

The intensity of poverty (A) reflects the proportion of the weighted component indicators in which on an average the poor people are deprived. For poor household only the deprivations summed and divided by the total number of indicators and poor people i.e.

$$A = \frac{\sum qc}{qd}$$

The MPI is then calculated as a product of head count ratio (H) and intensity of poverty (A i.e. MPJ = HC × A.

Check Your Progress :

1. What is poverty?
2. Define human poverty.
3. What is multidimensional poverty index?

1.7 Income Inequality :

There are various ways to measure income inequality. Two very popular methods are– (1) Lorenz Curve (2) Gini Co-efficient.

1. Lorenz Curve :

It is a diagramma HC way to depict the distribution of income in any society. Lorenz curve is used very often in economic research and discussion.

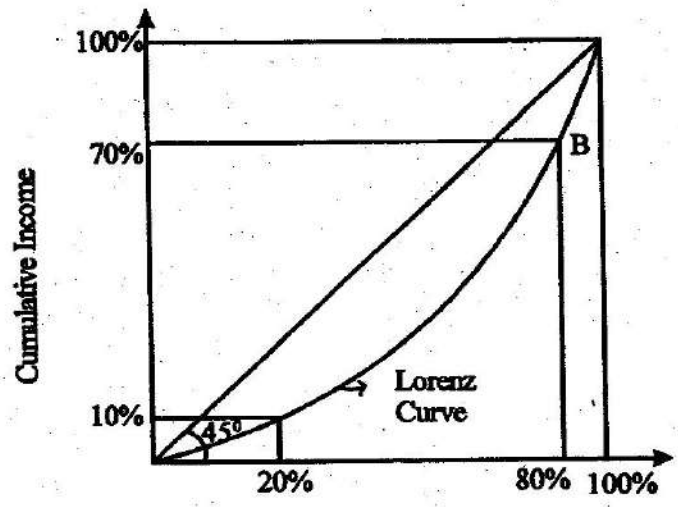


Fig. 1.1 : The Lorenz Curve of Income Distribution

In the figure, on the horizontal axis, we represent cummulative percentage of the population arranged in increasing order of income. On the vertical axis, we measure the percentage of national income which accrues to any particular fraction of the population.

For instance, point A corresponds to 20% on the population axis and 10% on the income axis. This means that the poorest 20% of the population earns only 10%. Of the overall income similarly, point B, corresponding to 80% on the population axis and 70% on the income axis represents that

the poorest 80% enjoys just 70% of the national income. The graph that connects all these points is called the "Lorenz Curve."

In the figure it is seen that the Lorenz Curve begins and ends on the 45° line. This means that the poorest 0% earns 0% of national income by defination and the poorest 100% which in just the whole population earns 100% of income. If everybody had the same income than Lorenz Curve would coincide with the 45° line. With the increase in inequality the Lorenz Curve would fall below the the 45° line in a loop that is always bowed out to the right of the 45° line.

The overall distance between the 45° line and the Lorenz Curve shows the amount of inequality present in the society. The further away the Lorenz Curve from the 45° line, greater is the extent of inequality.

2. Gini Co-efficient :

The Gini Co-efficient was formulated by the Italian statistician C. Gini in 1912. Gini Co-efficient can be derived on the basis of Lorenz Curve. It is defined as the ratio of the area between the diagonal (i.e. 45° line) and the Lorenz Curve with the total area of the half-square in which the curve lies.

The value of the Gini Co-efficient lies between 0 and 1. 0 indicates perfect equality and 1 indicates perfect inequality. Higher the degree of inequality, higher is the value of the Gini Co-efficient.

When Gini Co-efficient is multiplied by 100, we get Gini index. A zero valu represents perfect equality and a 100 value index represents perfect inequality.

The Gini Co-efficient as a measure of inequality can be explained with the help of the following diagram.

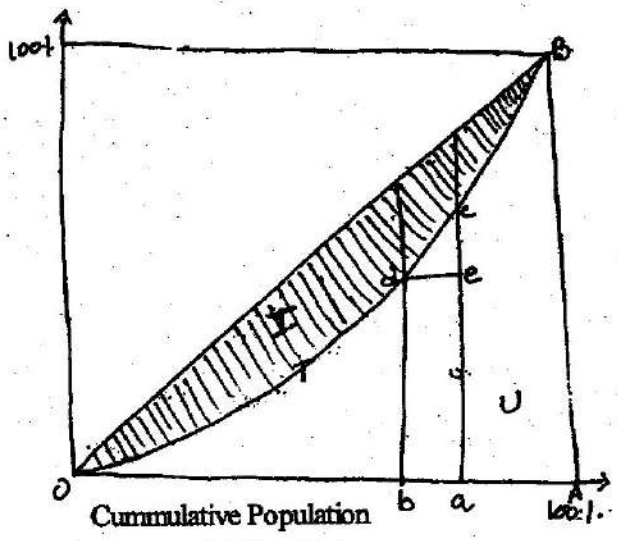


Fig. 1.2 Gini Co-efficient

In the figure 'I' represents the area bounded by the diagonal line and the Lorenz Curve. 'T' is the area of ΔOAB 'U' is the area bounded by OA and AB and the Lorenz Curve OB. Thus, 'V' is the complement of 'I' in the right angled triangle

The Gini Co-efficient 'G' can be expressed as–

$$a = \frac{I}{T} = \frac{T-U}{T} = I - \frac{U}{T} \quad \text{.....(1)}$$

Now let us take two points 'b' and 'a' on the horizontal axis and measure the area bounded by the points b, a, e, c, d. This will be–

$$(ab \times bd) + \frac{1}{2}(ce \times de)$$

$$= (ab \times bd) + \frac{1}{2}(ce \times ab) \quad [\because de = ab]$$

$$= (ab \times bd) + \frac{1}{2}\{(ac - ac)ab\} \quad [\because ce = ac - ae]$$

$$= (ab \times bd) + \frac{1}{2}(ac \times ab) - \frac{1}{2}(ac \times ab)$$

$$= (ab \times bd) + \frac{1}{2}(ac \times ab) - \frac{1}{2}(bd \times ab) \quad [\because ae = bd]$$

$$= \frac{1}{2}(ab \times bd) + \frac{1}{2}(ac \times ab)$$

$$= \frac{1}{2}(bd + ac)ab$$

In order to measure the area under 'U', we have to sum up the area under the 'Lorenz Curve', 'U' for all population groups as such

$$U = \frac{1}{2}\Sigma(ab)\,(bd + ac)$$

'T' is the area of the right angled triangle, as such

$$T = \frac{1}{2}(OA \,.\, AB)$$

$$= \frac{1}{2}(1.1)$$

$$\therefore T = 1/2$$

Now substituting the values of 'U' and 'T' in equation (1) we get,

$$G = 1 - \frac{\frac{1}{2}\Sigma(ab)\,(bd + ac)}{\frac{1}{2}}$$

or $G = 1 - \Sigma(ab)\,(bd + ac)$

Check Your Progress

1. Define Lorenz Curve.
2. How do you derive Gini Co-efficient from Lorenz Curve?

1.8 Redistribution with Growth :

It is widely perceived that the existence of moderate or high inequalities in income concentrate money in the hands of that section of the society willing to save and invest. This obviously would boost the rate of growth. However another group of economists argues that a certain degree of redistribution can push up the level of savings and hike up the growth rate.

The relationship between income inequality and the rate of savings is very complex and various factors may affect the ultimate fallout resulting in varying growth rate. However the fact remains in a poor country a significant redistributive policy, will bring down the rate of saving and in the process adversely affect the medium term and long term rate of growth.

Most less developed countries are caught in the dilemma where an egalitarian policy aimed in reducing the prevailing inequality and deprivation undermines their growth amibtions. The strong correlation between inequality and development make it necessary for these poor countries to make hard policy choices either to reduce inequality or achieve high growth rates.

1.9 Summary :

Growth is increase in output whereas development is growth plus change. Per capta income is commonly used as an index to measure the rate of development. However, overtime some other non-income indicators like Physical Quality Life Index (PQLI), Basic needs Approach, Human Development Index etc. Besides indicators measuring development gap also include poverty analysis, income inequality and growth. Income inequality is most commonly measured by Lorenz Curve and Gini Co-efficient.

1.10 Self Assessment Questions

1. Distinguish betwen the concept of economic growth and economic development.
2. How is development measured by Human Development Index.
3. How is Human Poverty Index Constructed? What is the difference between HPI-1 and HPI-2.
4. Define multidimenslonal poverty index. Describe how do we construct it.
5. Describe the methods of measuring income inequality.

1.11 Additional Readings :

1. Ray, Debraj, "Development Economics", Oxford University Press, New Delhi.
2. Thirlwall, A.P., "Growth and Development : With Special Reference To Developing Economics", PalgraveMacmillan, New York.
3. Todano, M.P. & Smith, S.C. "Economic Development", Pearson Education.

Unit 2 : Theories of Economic Growth

Structure :

2.0. Introduction :

An important and challenging problem faced by all the countries of the world today is attaining higher rates of economic growth. However, there was no systematic study on it for a long time. It is probably the publication of Adam Smith's 'An Enquiry into the Nature and Causes of the Wealth of Nations' which marks the scientific study of economic growth. This unit tries give an insight into the various growth theories.

2.1 Objectives :

The objectives of this unit to provide an insight to the classist approach to economic growth. Thereafter it analyses Marx and Schumpeter's theory of growth. Further the chapter tries to analyse Neo-classical and Endogenous Growth theories and points out their difference. Moreover, further down the chapter discusses the alternative Growth Models of Kaldor and Joan Robinson.

2.2 Classical Approach :

The classical school of though includes economists as Adam Smith, David Ricardo, Thomas Malthus, J.B. Say and John Stuart Mill. The theory can be explained in terms of the key components that bear upon growth, the stationary state and the doctrine of Laissez faire.

1. Growth and Growth Process :

In the Sphere of economic development, the classical economists tried to discover the causes of the long-run growth in national income, and the process where by the growth takes place.

Capital accumulation : According to the classicists, the key factor promoting growth is capital accumulation. It facilitates division of labour and it increases productivity of labour. Capital was considered complementary to labour rather than substitutes for them. According to them wages are fixed by the subsistence-level. So, a rise in the wage-level above the subsistence-level would increase population and thereby labour supply.

Profits, the Source of Saving : The classists considered savings as the source of capital accumulation, because only profit-earners save. Profits are the residual after wages and rents are paid. So long profits are rising, savings rise. All that was saved was assumed to be invested. Thus, profits were taken as the determinant of capital accumulation or investment.

Expansion of markets and demand : The extension of markets and an increase in the demand four consumption are also important in the process of growth. The limits to domestic market can be done away by securing overseas market. Extension of market not only facilitates both the division of labour and use of machinery but also forms a basis of external economics associated with large scale production.

Existence of favourable Social and institutional factors : The classicists stressed the importance of a social and institutional environment conducive for economic growth. These incluce– a sound administrative system, a stable government, well organised financial agencies, a legal system capable of ensuring security of persons and property, efficient organisation of the means of production, simple and well defined land holding system and inheritance and favourable social attitudes.

Decay and Decline of Capitalism : The classicists visualised the inevitable end to capitalism in terms of stationary state– a situation of no growth. They were unanimous about the fact that capitalism was fated to decay.

2 Stationary State :

The classicists argued that in the long run the capitalist system would inexorably led to a stationary state i.e. a state not of inactivity, but of no-growth. The competition among the capitalists would result in lowering of profits, exhaustion of natural resources, narrowing of profitable investments and falling interest rates. The stationary state that Smith envisaged is marked by low rate of profit, subsistence– level wages and high rents.

Pessimism : What follows from this inevitable state of stationary state towards the doom of capitalism is the pessimistic foreboding– that poor will always stay with us. This inference is from the unalterable classical law of distribution which Ricardo used to explain the movement of the system towards the stationary state. Cartyle, for good reason, described economics as a "dismal science" atleast in respect of the unalterable law of distribution.

3. Policy Implications :

The policy the classicists thought best crystalised into a non-intervention doctrine of Laissez-faire. It means that the government need not interfere in economic activities taking place in the market. The rational for advocation of the policy of laissez-faire was not based on any analysis of the market with government-intervention, but on the belief in a natural order of things arising from the enlightened self interest of individuals. Government functions were limited to the safegaurding of property rights, provision of national defence, maintenance of certain public works like highways, bridges, canals and harbours.

Critical Evaluation :

The classical theory contributed a lot in understanding the factors that promote economic progress of the countries. The advocacy of Laissez-faire was very suitable for the western countries in those day when cast in the frame of Britain's industrial revolution.

However, the assertion of savings depending on profits has not been accepted fully. Later theories of Savings and experience shows that there are non-profit sources of savings too. Another flaw is the investment-saving hexus of the classical school arising from the proposition that savings and investment gets automatically adjusted. But it may be that investment can exceed voluntary savings. Besides, the contention of law of diminishing returns intiating stationary state was found to be untrue. With advancement in technology the diminishing returns can be postponded indefinitely. Lastly, equilibrium wage rate is not equal to the subsistence wage rate.

To conclude, the classical school souds quite relevant in context of analysing situations of under-development although it has some weaknesses.

2.3 The Theory of Marx :

Marxian theory essentially explains the process of capital accumulation under capitalism. It tries to give logical explanation of the inevitable collapse of the capitalist system and its replacement by socialism.

Capitalist mode of Production :

One of the feature of the capitalist modeof production is private ownership in the means of production. The capitalist employs labour and other means of production for the production process. Of the total product the labourer is paid the wages and the excess is surplus that the capitalist takes. The excess is designated as 'surplus value'. Capitalism is thus called a system where production is for profit.

The roots of capital accumulation lie in the motivation of the capitalist, which is specifictothe system. Besides capital accumulation, the capitalist after certain stage of development craves for luxuries and enjoyments. The capitalist strives for larger and larger magnitude of capital, together with changes in the methods of production and in that process capital accumulates.

Profits and Surplus Value :

The capitalist system involves making as much profit as possible and accumulating as large a part of profit as possible. This involve increase in the surplus-value and rise in the proportion of the surplus-value used for engaging more workers and for increasing constent capital. The surplus value arises in the capitalist system through exploitation of labour. The surplus value expressed as a percentage of variable capital is the degree of exploitation of the labour and is given is–

$$S = \frac{\text{Surplus} - \text{Value}}{C + V} \times 100$$

Where C is the constant capital

and V is the variable capital.

Hence, larger the degree of exploitation, greater the surplus value. The relation of surplus – value to the total capital given the rate of profit. It is written as–

$$S = \frac{S}{C + V} \times 100$$

Where P is the rate of profit

S is the Surplus – value

Cis the constant capital

V is the variable capital

So, the key factor in capital accumulation us the rate of profit which has a tendency to declien. This is because the increase in the organic composition of capital has the tendency to lower the rate of profits.

Concentration and Centralisation :

An aspect of capital accumulation under capitalism is the growth capital size in a few hands. This is due to the fact of the owner's drive to continusuly increase the original capital with which he starts and the fierce competition among the capitalist to gain the upper hand in the system. Centralisation (along with concentration) is one of the methods whereby capitalists accumulates capital and grow in size. This tendency towards growth in the size of capital is an inevitable and normal feature of the working of capitalism and provides a basis of concentration of production. This in turn stimulates the concentration of capital and multiplies its sources.

Cyclical Accumulation :

Capital accumulation under capitalism is cyclical in nature. It is cyclical in the sense that the economy moves periodically from one crisis to the next passing through the phases of depresson, recovery, boom and crisis once again. The cycle starts with its main phase, crisis which denotes an interuption of the process of on-going production in the form of over-production or under-consumption in the economy and passes through various hases to reach crisis again. As such the cycle starts again.

Collapse of Capitalism :

Marx theory is about the development and end of capitalism and its replacement by a superior form of social organisation, namely socialism. The seeds of the destruction of capitalism lies within the system in its basis contradiction between production which is social in character and the appropriation of its results by the capitalists, which is private in character. This makes the occurrence of economic crisis inevitable and chronic. The system is thus prone to contraction and crisis due to exploitation which forms the basis of the system. The clash between the two classes of the system, namely the capitalists and the workers leads tothe destruction of the system and replacing it by socialism by wielding the power of owning the means of production to the working class.

Thus, the Marxian theory explains the process and nature of capital accumulation in a capitalist society, spurredby the lust for increasing capital. The formulation is also made that capialism, under the weight of its own contradictions would breakdown and would be replaced by socialism.

2.4 Schumpeter's Theory :

Schumpeter's theory marks a distinct landmark in the field of economics. Besides describing how growth takes place he also predicts how capitalism carried within itself the seeds of its own destruction and finally replaced by socialism.

In Schumpeterian scheme of things development in capitalism is based upon the entrepreneurs who introduce innovations which financed by banks which supply credit. Thus the growth process involues three principal elements namely– Innovations, Entrepreneur and Bank Credit.

The stationary state is a condition of no net investment, no population-growth and no profit. Under such circumstances, production takes on a circular form. Such an equilibrium position is disturbed when an entrepreneur introduces some innovations into the system with the help of eadily available bank credit. As a result the value of product exceeds the value of the factors of production leaving profits to the pioneering entrepreneur. This spurs others to join and as such output increases.

Innovations :

According to Schumpeter, innovations can take on any of the following five types :

(a) producing a new good or a new quality of a good

(b) new method or technique of production

(c) finding or discovery of a new market

(d) locating a new source of supply and

(e) Re-organisation of an industry.

Entrepreneur :

An entrepreneur according to Schumpeter possess leadership qualities and pioneers in breaking new grounds. Development occurring in discontinuous spurts involves high degree of uncertainty and risk. It is the entrepreneur who undertakes risk and imparts innovations into the system with the view of profits maximisation.

Bank Credits :

Besides innovations and the innovating entrepreneur, bank credit is another essential element of the Schumpeterian model. Credit availability gives entrepreneur the freedom to undertake risks of investments connected with innovation which otherwise would have to depend upon the routine savings. The banks advancing credit can and does share and promote undertaking of risks.

Cummulative Process :

The output expansion, intiated byt he entrepreneur, increases in size with time, making it cumulative. It happens in two ways– (a) Primary increase in production

(b) Secondary output expansion.

Primary increase in production takes place in the industry in which innovations are introduced. However, the innovations and thus expansion of that industry's output, do not remain confined to that industry alone. It contributes to the adoption of innovation in other industries too resulting in an increase in production. According to Schumpeter, innovations come in clusters, and spread in many industries. Associated with this process are the entrepreneurs who make a swarm - like apearance to breathe newness in many fields.

The secondary output expansion takes place in the old industries, particularly in consumer-goods industries. Their production also expands within the existing production-patterns. Investments for the secondary expansion are of imitative type and should be distinguished from the innovative investment. Together with secondary expansion, the impact of primary expansion is therefore very large. It is this expanding character of production that makes growth cumulative in nature.

Creative Destruction :

Alongside the generation of impulses for continuing expansion, there takes place re-adjustments among the new and the old industries. The result is the change of industrial set-up, called the creative destruction along two lines– one, change in the composition of output i.e. shift of resources from consumer goods production to producer goods production, second, change in respect of industries themselves. The results in painful restructuring where the old decays and wipes out and is replaced by new and better industries.

Cyclical Growth :

According to Schumpeter the course of growth is not continuous, it reaches its limits to start again and so on. The limit is reached, when the environment for innovational investment becomes unfavourable due to two reasons– one, the credit expansion that oils these investments, itself approaches its limits. And second, the expansion of production, both on primary and secondary counts creates glut in the market. As such the economy is pulled onto a cumulative doward movement into a state of depression. However, the phase of depression doesnot last forever and soon is replaced by an upward swing in economic activities. Thus, the growth takes place in the manner of cyclical movements on the rising curve.

End of Capitalism :

Schumpter predicted that capitalism is fated to destroy itself. The reason : its very success. The system in its economic successes on the development-front undermines the social institutions that constitute the capitalist society. As such hostile conditions tothe continuation of the system are created and the system is eroded to crumps. The result is the replacement of capitalism which Schumpter equates with socialism.

To conclude, capitalism destroys itself by being successful through the erosion of its institutions by the hostility of its intellectuals and other elite classes by weakening of the entrepreneurial motivation.

2.5 Harrod-Domar Model of Economic Growth :

Economic growth is the result of abstention from current consumption. An economy produces variety of commodities which generates income. The income generated is spent either on consumer goods or capital goods. However, all the income is not spent on current consumption a part of it is also saved which forms the basis for investment. This gives us the idea of macroeconomic balance which is the core of all growth theories. Macro-economic balance is achieved when investment demand is at a level that exactly counterbalances the savings leakage.

Using standard economic notation, the following equation must be true as a matter of accounting.

$$Y_t = C_t + S_t \text{ ..... (1)}$$

Where Y_t is the national income for time period t

C_t is the consumption for time period t

S_t is the savings for time period t

In other words, national income is divided between consumption and savings. On the other hand, the value of produced output must be equal to the goods produced for consumption and also those needed for investment i.e.

$$Y_t = C_t + I_t \text{ ..... (2)}$$

Where Y_t is the output for time period t

C_t is the consumption for time period t

I_t is the investment for time period t

Combining (1) and (2) we get the famous macroeconomic balance equation–

$$S_t = I_t \text{ ..... (3)}$$

i.e. Savings = Investment

Investment avgments the national capital stock (K) and replaces that part which has depreciated. It δ is that fraction of capital stock depreciates the we have–

$$K_{t+1} = (I - \delta) K_t + I_t \text{ .....(4)}$$

This indicates that capitla stock must change over time–

i.e. $K_{t+1} = (I - \delta) K_t + S_t$ ..... (5)

Here, we introduce two important concepts–

a. Savings rate (s) and **b.** capital – output ratio (k).

savings rate is just savings divided by income, S_t/Y_t

i.e. $s = S_t/Y_t$

$\Rightarrow S_t = s.Y_t$ ..... (6)

Capital – output ratio (k) is that amount of capital required to produce a single unit of output and is represented as–

$k = S_t/Y_t$

$K_t = k.Y_t$ ..... (7)

Using equation (6) and (7) in equation (5) we have–

$K_{t+1} = (1 - \delta)K_t + S_t$

$\Rightarrow k.Y_{t+1} = (1 - \delta)k.Y_t + s.Y_t$ .....(8)

$\Rightarrow k.Y_{t+1} = k.Y_t - \delta kY_t + s.Y_t$

$\Rightarrow k.Y_{t+1} - k.Y_t = s.Y_t - \delta kY_t$

$\Rightarrow k(Y_{t+1} - Y_t) = (s - \delta k)\, Y_t$

$\Rightarrow \frac{Y_{t+1} - Y_t}{Y_t} = \frac{s - \delta k}{k}$

$\Rightarrow \frac{\Delta Y}{Y_t} = s/k - \delta$

$\Rightarrow g = s/k - \delta$ ....(9)

where, g is the overall rate of growth. This is the Harrod-Domar equation, named after Roy Harrod and Evsey Domar for their papers on the subject in 1939 and 1946 respectively.

With a small amendment to the Harrod-Domar model allows us to incorporate the effects of population growth. It population (p) grows at rate n, then we have–

$P_{t+1} = P_t(1 + n)$ for all t

$\Rightarrow \frac{P_{t+1}}{P_t} = 1 + n$ .....(10)

Now, if Y_t is the per capita income then we have

$y_t = Y_t/P_t$

$\Rightarrow y_t = Y_t.P_t$ ..... (11)

Now, if g* is the rate of per capita growth then–

$y_{t+1} = Y_t + g^* Y_t$

$$\Rightarrow y_{t+1} = y_t (1 + g^*)$$

$$\Rightarrow \frac{y_{t+1}}{y_t} = 1 + g^* \quad \text{.....(12)}$$

Now dividing both sides of equation (8) by P_t and also using (11) we have–

$$k.Y_{t+1} = (1 - \delta)\, k.Y_t + s.Y_t$$

$$\Rightarrow k.y_{t+1} . P_{t+1} = (1 - \delta)k.\, y_t.P_t + s.Y_t . P_t \text{ [Using (11)]}$$

$$\Rightarrow k.y_{t+1} . \frac{P_{t+1}}{P_t} = (1-\delta)\, k.y_t . \frac{P_t}{P_t} + s.y_t . \frac{P_t}{P_t}$$

Now, dividing by $Y_t.k$ we get–

$$\Rightarrow \frac{k.y_{t+1}}{y_t.k} . \frac{P_{t+1}}{P_t} = \frac{(1-\delta)\, k.y_t}{y_t.k} + \frac{s.y_t}{k.y_t}$$

$$\Rightarrow \frac{y_{t+1}}{y_t} . \frac{P_{t+1}}{P_t} = (1-\delta) + s/k$$

$$\Rightarrow s/k = \left\{ \frac{y_{t+1}}{y_t} . \frac{P_{t+1}}{P_t} \right\} - (1-\delta)$$

$$s/k = (1 + g^*)(1 - n) - (1 - \delta) \quad \text{.....(13)}$$

The above expression combines some of the fundamental features underlying growth : the abil to save and invest (captured by s), the abilityto convent capital into output (which depends invers on k), the rate at which capital depreciates (s) and the rate of population growth (n).

Harrod's original model is a dynamic extension of Keynens' static equilibrium analysis. Harr questioned that if changes in income induce investment, what must be the rate of growth of inco for planned investment to equal to planned savings to ensure a moving equilibrium in a growi economy through time? Moreover, is there any guarantee that this required rute of growth w prevail? If not what will happen? And if growth equilibrium is disturbed will it be self-correcting o self-aggravating? Besides, will this equilibrium rate be equal to the maximum rate of growth that th economy is able to sustain given the growth rate of productive capacity? If not, what will happen?

To answer these questions, Harrod distinguished three different growth rates namely the actual growth rate (g), the warranted growth rate (g_w) and the natural growth rate (g_n). The actual growth rte is defined as–

$$g = s/_k \quad \text{..... (14)}$$

where s is the ratio of savings to income ($^{S}/_{Y}$)

k is the actual incremental capital - output ratio $\left(\Delta k/\Delta Y = I/\Delta Y\right)$

To know whether the actual growth rate will keep the planned investment and planned savings n line with one another at full employment in future we need the concepts of warranted growth rate g_w) and natural growth rate g_n).

Warranted growth rate is that rate that induces just enough investment to match planned savings without undercapacity or over capacity with capital fully employed. It is given as–

$$g_w = s/k_w \quad \ldots\ldots (15)$$

where kw is the warranted incremental capital output ratio.

For dynomic equilibrium, output must grow at this rate. The condition for equilibrium is $g = g_w$ .e. actual growth rate = warranted growth rate. Now if $g > g_w$ then $k < k_w$, which means that actual nvestment falls below the level required to meet the increase in output. Conversely, if $g < g_w$ then $c > k_w$, there will be a surplus of capital goods and investment will be discouraged, causing the actual growth rate to full even further below the equilibrium rate. A departure from equilibrium would be self-aggravating instead of being self-correcting.

The American economist, Every Domar, working independenly of Harrod, also arrived at the same conclusion but by slightly different route. Domar recognized investment as a double-edged sword increasing both demand via the multiplier and supply via its effect on expanding capacity. Domar therefore questioned about the rate of growth of investment that must prevail for demand and supply to grow in line. The crucial rate of growth of investment is derived as – changes in the level of investment increases demand by–

$$\Delta Y_d = \Delta\, 1/s \quad \ldots\ldots (16)$$

and investment itself increases supply by–

$$\Delta\, Y_s = I\, \partial$$

where δ is the productivity of capital.

For $\Delta\, Y_d = \Delta\, Y_s$ we must have,

$$\Delta\, 1/s = I\, \partial \quad \ldots\ldots (17)$$

$$\text{or } \frac{\Delta I}{I} = s\, \partial \quad \ldots\ldots (18)$$

i.e. investment must grow at a rate equal to the product of the savings ratio and the productivity of capital.

But growth rate which ensures full utilization of capital stock and a moving equilibrium through line, does not guarantee full employment of labour depending on natural growth rate. The natural rate of growth is made up of two components that are exogenously determined – the growth of laour

force (l) and the growth of labour productivity (q)

i.e. $g_n = l + q$ ..... (19)

The natural growth rate defines the long-run full employment equilibrium growth rate and sets an upper limit to actual growth rate. If $g > g_w$, g can diverge from g_n only until it hits g_n. In the long run g cannot be greater than g_n. The full employment of labour and capital requires–

$g = g_w = g_n$ .....(20)

This Joan Robinson once called a 'golden age' to emphasize its mythical nature. Now, if $g_w > g_n$, there will be a chronic tendency towards depression as there will be too much of capital and saving. Alternately if $g_w < g_n$, there will be a tendency towards demand inflation for there will be a tendency for the actual growth to exceed than what is necessary to induce investment to match savings.

In most developing countries $g_n > g_w$. Therefore, in face of such problem, the first possibility is to reduce the growth of labour force i.e. l or second, reduce the rate of growth of labour productivity i.e. q. Thired, rise in the savings ratio could narrow the gap. Finally, the gap both g_n and g_w can be reduced through a reduction in the required capital – output ratio through the use of more labour – intensive techniques.

These adjustment mechanism is illustrated by the following figure.

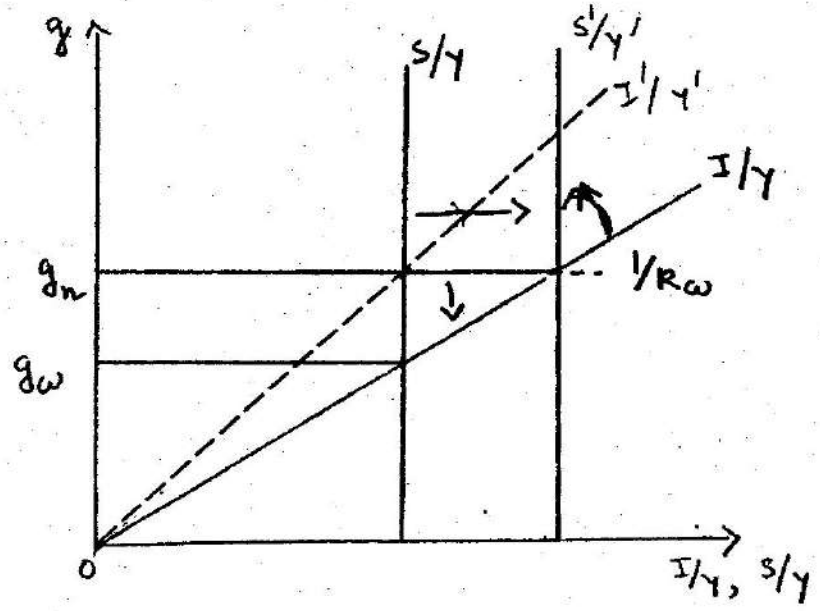


Figure 2.1 - Adjustment of g_w & g_n

In the figure, growth is measured on the vertical axis, and the investment and savings ratio on he horizontal axis. Savings ratio is independent of the growth rate Growth and investment ratio are elated through k_w required capital-output ratio. In the figure $g_n > g_w$, and to equalise g_n and g_w, we :an bring down g_n to g_w by measure to curb labour force growth rate and hence shift $^S/_Y$ curve ightwards through monetary and fiscal policies. Other way round to raise g_w to g_n we an pivot $^I/_Y$ curve inwards by reducing k_w through the use of more labour intensive techniques of production.

!.6 Neo-Classical Model of Growth–Slow :

The basic neo-classical growth model was developed by Robert Solow and Trevor Swan in 1956. The fundamental assumption of the model is that depending upon the relative availability of abour and capital the capital output ($^K/_Y$) ratio adjust. If capital increases faster than labour, then the :apital-output ratio increases but the productivity of capital falls i.e. $^Y/_k$ falls because capital exhibits diminishing returns to scale. The productivity of capital would keep on falling untill the growth of :apital and labour are brought back of line. Conversly, if labour grows faster than capital, productivity of capital will increase due to increasing returns to scale to capital and growth of labour and capital would again be brought back to line. The model is based on three key assumptions.

- The labour force grows at a constant exogenous rate, *l*.
- Output is a function of capital and labour i.e. Y = f(K, L). The production function exhibit constant returns to scale, and individual factors of production exhibit diminishing returns to scale.
- All savings are invested i.e. S = I = sY.

  The neo-classical model is thus designed to show–
  - The economy will tend towards long run equilibrium where capital-labour ratio (R*) and output per head (q*) will be at equilibrium.
  - Capital, labour and output will grow at the same rate, which is the natural rate '*l*'.
- There will convergence of per capita income across globe.

The most commonly used neo-classical production function with constant returns to scale is the Cobb-Douglas production function :

$Y = b\, k^{\alpha}\, L^{1-\alpha}$ ..... (1)

where α is the elasticity of output with respect to capital

$(1 - \alpha)$ is the elasticity of output with respect to labour.

Assuming constant returns to scale we have

$\alpha + (1 - \alpha) = 1$

Re-writing equation (1) in labour intensive form we have–

$$\frac{Y}{L} = \frac{bk^{\alpha}L^{1-\alpha}}{L}$$

$$\Rightarrow Y/L = b\,k^{\alpha}.L^{-\alpha}$$

$$\Rightarrow Y/L = b\left(K/L\right)^{\alpha}$$

or $q = b(k)^{\alpha}$ ..... (2)

where q is the output per head

and k is the capital per head.

The 'labour-intensive' form of the neo-classical production function is shown in the figure below.

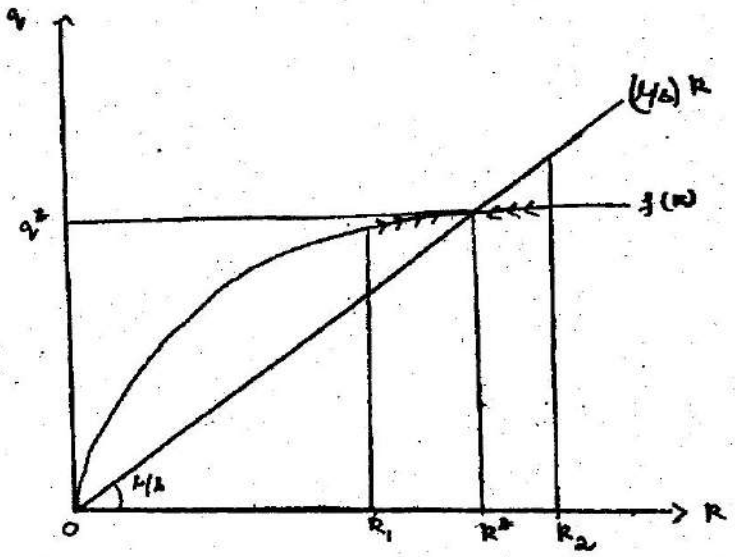


Figure 2.2 Equilibrium capital-labour ratio and output per head

The diminishing slope of the production function in the figure indicate diminishing marginal product of capital. Imposing a ray from the origin on the production function we determine theequilibrium capital per head and output per head. Along the ray from the origin the rate of growthof capital is equal to the rate of growth of labour and is given by–

$q = (1/s)\,k$ ..... (3)

where s is the saving ratio.

The straight line from the origin with slope $1/s$ shows the level of 'q' that will keep capital per head constant and also the level of 'k' that will keep output – per head constant, given the rate of growth of labour force '*l*'. The slope of the ray from origin to any point on the production function

determines the capital – output ratio at that point.

The point where the production function and the ray from the origin intersects determines the equilibrium capital – labour ratio (k*) and output per head (q*). To the left of k* (at k_1), output per head (q) is greater than necessary to keep capital per head constant i.e. $q > (^{l}/_{s})k$. So, steady growth requires more capital-intensive techniques; and there will be a movement from k_1 towards k*. Similarly, to the right of k* (at k_2), $q < (^{l}/_{s})k$ i.e. q is less than necessary to keep 'k' constant; and steady growth requires more labour intensive techniques. Thus, the capital output ratio adjusts to bring the rate of growth of capital and labour into line.

At k* both k and q are in equilibrium which implies that output labour and capital all must grow at thesame rute, *l*, the natural rate of growth, with capital – output ratio constant.

Part 1 : Savings Ratio :

If there is an increase in the ratio of savings and investment to national income (s) it lowers the slope of the $^{l}/_{s}$ line. This increases the equilibrium level of percapita income and capital labour ratio, but leaves the equilibrium growth rate unchanged.

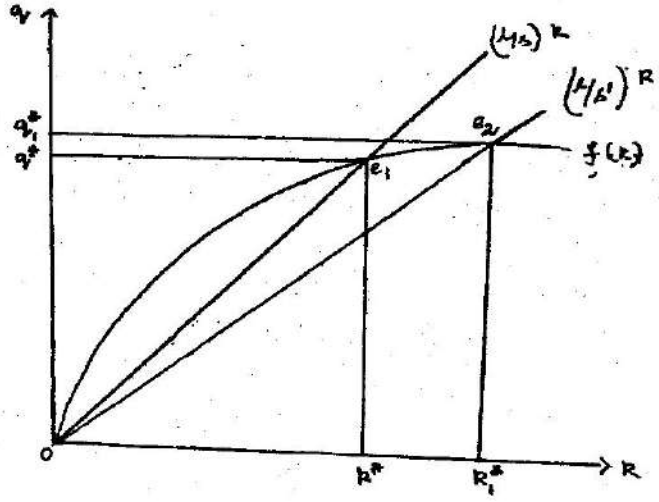


Figure 2.3

This explains the propositions that the level of per capital income doesnot depend on the ratio of saving and investments to GDP, and in the long run steady state, the growth of outputis determine by the rate of growth of the labour force in efficiency units. This is because of the reason that a higher savings-investment ratio is off-set by a higher capital-output ratio. Thus, the capital-output ratio adjusts passively to keep growth of capital in line with the growth of the labour force.

Part 2 : Introduction to Technical Progress

Technical progress here refers to Harrod's neotrul technical progress which augments the productivity of labour and leaves the capital-output ratio unchanged. The effective labour force therefore grows at the rate $l + q'$ where, l is the growth of labour and q' isthe rate of growth of labour productivity. Equation (3) defining the relation between q and k that keeps the capital-labour ratio and capital output-ratio constant,now becomes :

$$q = \frac{l+q'}{s} \cdot k \quad \text{.....(4)}$$

So, now the $^{I}/_{s}$ line becomes steper because output per head must now be higher to provide the saving and capital accumulation required to keep the capital-labour ratio constant with faster growth of the effective labour force.

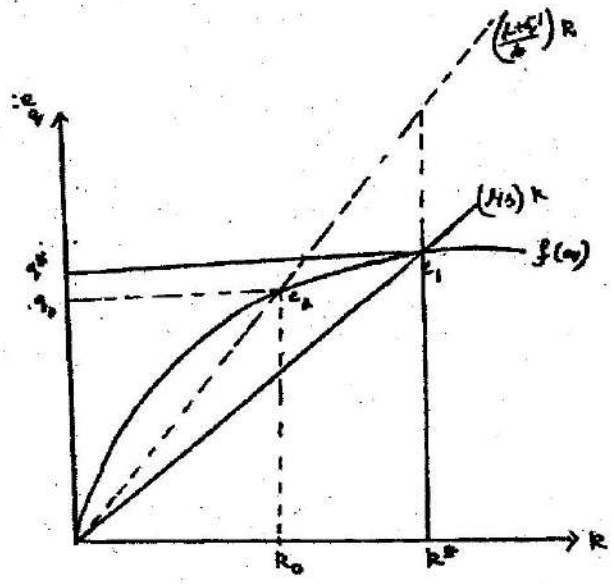


Figure 2.4

At equilibrium k* we have $^{DK}/_{k} = l + q'$ and at equilibrium q* we have $^{Dy}/_{Y} = l + q'$ so that $^{DY}/_{Y} = ^{Dk}/_{k} = l + q'$, and output per.head and capital per head growat rate q'. So, by the rate of Harrod heutral technical progres we have–

$$\frac{\Delta Y}{Y} - t = \dot{\Delta K}/K - l = q' \quad \text{.....(5)}$$

Thus, a rise in saving-investment ratio to GDP still has no effect on the eqqulibrium growth of output.

Part 3 : Convergence :

The neo-classical growth model proposed that thepoor countries would grow faster than rich cuntries, leading to the convergence of percapita income. The capital output ratio may be written as–

$$K/Y = K/L \cdot L/Y \quad \ldots\ldots\ldots (6)$$

Since capital exhibits diminishing returns so higher K/L ratio is associated with a higher K/Y ratio. If the ratio of savings and investment to GDP is the same across countries, capital-rich countries would grow slower than capital-poor countries. The increase in capital is off-set by falling productivity of capital in the capital-rich countries and as such there would be convergence of per-capita income across globe.

2.7 New Endgeneous Growth Model :

If diminishing returns to capital does not hold then saving and investment to GDP would matter for growth and it would be endogenously determined. The forces would prevent marginal product of capital from fulling and the capital - output ratio from rising as more investment takes place as countries get richer.

Since the mid-1980s there has been an outpouring of literature and research on the applied economics of growth, attempting to understand and explain the differences in the rates of output growth and per capita income growth across the world. This came to be known as 'new' growth theory or endogenous growth theory. The theory relaxed the assumption of diminishing returns and showed that capital can exhibit either constant or increasing returns to scale. As such there can be no presumption of per capita convergence of income across the world. Relaxing diminishing returns to capital, investment becomes important for long run growth and growth is endogenous in that sense.

Robert Lucas (1988) and Paul Romer (1986, 1990) are the pioneers of endgenous growth model. They assumed positive externalities to be associated with human capital formation (education and traing) and research and development (R & D) prevents the marginal product of capital from falling and the capital-output from rising. Therefore we have a production function in capital as–

$$Y = AK^{\alpha} \quad \ldots\ldots(1)$$

where K is a composite measure of capital (physical capital plus other types of reproducible capital)

and $\alpha = 1$.

The first crude test of the new endogenous growth theory see whether or not poor countries grows faster than rich ones. Alternately, whether there is an inverse relation between the growth of output and intial level of per capita income.The equation to be estimated is thus given as–

$$g_i = a + b_i (PCY)_i \quad \ldots\ldots\ldots (2)$$

where, g_i is the average growth of output per head of country 'i' over number of years.

and $(PCY)_i$ is the intial level of per capita income for the country 'i'.

Nowthe estimate of b_1 would give the convergence or divergence. A significantly negative estimate of b_1 would mean unconditional convergence or beta (β) convergence. However, if the estimate of b_1 is not significantly negative or invariably positive it would indicate divergence.

Before rejecting the neoclassical model however it must be accounted that the neoclassical prediction of convergence assumes that in all countries around the globe the factors affecting productivity of labour such as saving or investment ratio, population growth, technology etc are same. However, these assumptions are false as such there can never be the presumption of unconditional convergence, only conditional convergence, holding constant all other factor that influence the growth of percapita income, including population growth (p), the investment ratio ($^I/_Y$) and variableaffecting productivity of labour as education (ED), research and development (R & D), trade (T) and also non economic variables such as political stability (PS), measured by number of revolutions and coups. So, now the equation to be estimated is–

$$g_i = a + b_1 (PCY)_i + b_2(P)_i + b_3 (^I/_Y)_i + b_4 (ED)_i + b_5 (R \& D)_i + b_6 (T)_i + b_7 (PS)_i + ...(3)$$

Now, of after making allowance for all the other factors the sign of b_1 turns to be negative ($b_1 < 0$), this is the rehabilitation of the neoclassical model, i.e.there would be convergence. But if the sign of b_1 turns to be positive ($b_1 > 0$), then the new endogehous growth theory could be accepted. It could be concluded that all the factors keep the marginal product of capital from falling and capital-output ratio from rising leading to divergence in percapita income across globe.

2.8 Alternative Growth Model :

2.8 (a) Joan Robinson Modelof Growth :

Joan Robinson in her book "The Accumulation of Capital" presented her model of economic growth in 1956. Her model was stated in verbal terms and the mathematical formalization was done by Kenneth K. Kurihara.

The model is based on the assumption of laissez faire, with two factors of production namely capital and labour. Wage earness spend all of their wae income on consumption, while the profit earners save and invest. It was also assumed that capital and labour are combined in fixed proportions to produce a given output. However this assumption was later relaxed by Robinson to allow for the complications of reality.

The basic equation of distribution of national income among the entrepreneurs and the workers are given by–

$$pY = wN + \pi pk \quad .....(1)$$

where Y is net national output

N the amount of labour employed

K the amount of capital equipment utilized

p the average price of output as well as of capital equipment

w is the money wage rate,

and π the gross profit (including the interest rate)

Now dividing both sides of equation by the average price index p we get the distribution equation in real terms as–

$$Y = \frac{w}{p} N + \pi K \text{ .....(2)}$$

The profit rate is thus obtained as from (2)–

$$\pi = \frac{Y - {}^{w}/_{p} \cdot N}{K}$$

$$= \frac{{}^{Y}/_{N} - {}^{w}/_{p}}{{}^{K}/_{N}}$$

Now if ${}^{Y}/_{N} = \varphi$ and ${}^{K}/_{N} = Q$ then we have

$$\pi = \frac{\zeta - {}^{w}/_{p}}{Q} \text{ .....(3)}$$

Equation (3), show that profit rate depends on the technical relation of labour productivity (φ), the real wage rate (${}^{w}/_{p}$) and the capital-labour ratio Q.

The necessary condition formaximization is that the first derivative should be zero i.e.–

$$\frac{d}{dQ}\left(\frac{\zeta - {}^{w}/_{p}}{Q}\right) = 0 \text{ .....(4)}$$

Subject to the production function–

$Y = f(N, K)$ .....(5)

On the expenditure side the net national real income should be equal to the sum of real consumption expenditure (c) and net real investment (I) in equilibrium i.e.

$Y = C + I$; $S = I$ .....(6)

Now, consumption is done by wage earners while savings are out of the profit of the entrepreneurs by assumption. So, we have–

$C = C_{a} = {}^{w}/_{p} \cdot N$ .....(7)

& $S = S_{k} = \pi K$ .....(8)

where C_{a} is consumption out of wage income and S_{k} is saving out of profit income.

Net investment involved in equation (6) is nothing but an increase in real capital. So, we have

$I = \Delta K$ .....(9)

Substituting the value of S and I from equation (8) and (9) in equation (6) we get–

$\pi K = \Delta K$ .....(10)

Dividing equation (10) by K on both sides we have–

$$\frac{\pi K}{K} = \frac{\Delta K}{K}$$

$$\Rightarrow \pi = \frac{\Delta K}{K}$$

Substituting the value of π in equation (3) we get–

$$\pi = \frac{\varphi - {}^{w}/_{p}}{Q}$$

$$\Rightarrow \frac{\Delta K}{K} = \frac{\varphi - {}^{w}/_{p}}{Q} \text{.....(11)}$$

In equation (1), ${}^{\Delta K}/_{k}$ indicates the rate of growth of capital; $(\varphi - {}^{w}/_{p})$ indicates the net return to c apital and Q is the capital-labour ratio. So, equation (11) shows the rate of growth of capital that is capable of increasing if the net return to capital rises in greater proportion than the capital-labour ratio. This is Ricardian terms means that with unchanged technological conditions, capital accumulation is strengthened by a falling real wage rate and weakened by a rising real wage rate.

Joan Robinson describes the 'golden age' as one where there is full employment of labour and full utilization of capital. In Roy Harrod's language golden age corresponds to a situation where the natural, the warranted and the actual rate of growth of national income are all equal. It represents a state of economic bliss, since consumption is then increasing at the maximum technically feasil rate which is compatible with maintaining that rate of increase.

Kurihara also represented the relationship between Robinson's model and the models Harrod and domar with the following mathematical symbols–

Taking equation (2) into account and rearranging, equation (3) can be rewritten as–

$$\pi = \frac{Y - {}^{w}/_{p} N}{K}$$

$$\Rightarrow \pi = {}^{Y}/_{K}\left(\frac{Y - {}^{w}/_{p} . N}{Y}\right) \text{.....(12)}$$

The share of profit in national income is given by $\left(\frac{Y - {}^{w}/_{p} . N}{Y}\right)$ while ${}^{Y}/_{K}$ is the mean capital productivity. So, the profit rate is the product of capital productivity (represented by δ in Domar's model) and the share of profits in national income.

From equation (8) we know–

$S = \pi K$

$$\therefore \frac{Y - {}^{w}/_{p} N}{Y} = \frac{\pi K}{Y} = {}^{S}/_{Y} = s$$

which gives the Domar equation as–

$$\frac{\Delta K}{K} = \pi = \gamma s$$

Since $b = {}^{1}/_{s}$, we get the Harrod equation as–

$$\frac{\Delta K}{K} = \pi = {}^{s}/_{b} \quad \text{.....(13)}$$

Thus, J. Robinson's model gives the same result as the models of Harrod and Domar, but with a difference. J. Robinson makes capital accumulation depend explicitlyon the profit-wage relation (π and ${}^{w}/_{p}$) as well as on labour productivity (φ), bringing her theory closer to a real market economy. Another difference is that whereas Harrod and Domar approached the question of capital accumulation from the standpoint of capital, Robinson approached it from the standpoint mainly of labour.

J. Robinson seems to imply that individualistic capitalism cannot grow except by reducing basically the price of labour relatively to the price of capital as well as to labour productivity. Kurihara thus pointed out that this could possibly be Robinson's way of saying that underdeveloped countries instead of following the capitalist rules of the game but should adopt a mixed economy of fiscal and monetary policies geared to encouraging autonomous investment.

2.8 (b) Kaldor's Model of Economic Growth :

The core of the new endogenous growth theory of non-diminishing returns to capital or constancy of the capital-output ratio was pioneered by Lucas and Romer who emphasized externalities to education and research. But much before Lucas and Romer, Nicholas Kaldor in 1961 pointed out the fact that despite continued capital accumulation and increases in capital per head through time, the capital-output ratio remains broadly the same, implying some form of externalities or constant returns to capital.

Kaldor's explanation served as a critique of the neo to the neo-classical production function. His explanation by in his innovation of the "technical progress function" relating to the rate of growth of output per worker q* and the rate of growth of capital per worker k* which is shown in the figure below.

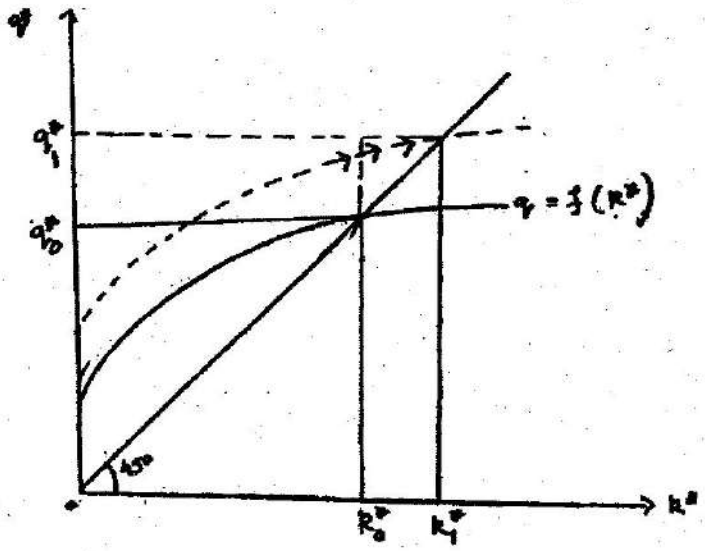


Figure 2.5 Kaldor's technical progress function

The position of the technical progress function depends on the exogenous rate of technical progress and also the slope of the function depends on the extent to which technical progress is embodied in capital. Along the 45⁰ line the capital-output ratio is constant, and the equilibrium growth of output per head will be q_0*. An upward shift of the technical progress function associated with new discoveries, a technological breakthrough or more education will shift the curve upwards, causing the growth of output to exceed the growth of capital, raising the rate of profit and indusing more investment to give a new equilibrium growth of output per workes to q_1*. This would cause the capital-output ratio to rise due to an increase in capital accomulation without an associated upward shift in the schedul. So, Kaldor's technical progress function is a true progenitor of endogenous growth theory.

Theory of Distribution and Saving Function :

Another important aspect of Kaldor's growth theory is the theory of distribution and saving function. Kaldo assumed that there is full employment in the economy and that national income is distributed between workers and entrepreneurs in terms of wage (w) and profit (p).

Thus,

$Y = w + p$ ..... (1)

Total savings (s) consists of saving out of profits (S_p) and savings out of wage (S_w) i.e.

$S = S_w + S_p$ .....(2)

Kaldor further assumed that marginal propensity to consume of workers is greater than the marginal propensity to consume of the capitalists. Hence, the marginal propensity to save of the workers (s_w) is less than the marginal propensity to save of the capitalists (s_p) ie. $s_w < s_p$. Thus, equation (3) can be written as–

$$S = s_w.W + s_p.P$$

$$\Rightarrow S = s_w (Y - P) + s_p . P \qquad [\because Y = w + p \;\; \therefore W = Y - P]$$

$$\Rightarrow S = s_w Y - s_w P + s_p P$$

$$\Rightarrow S = s_w Y + (s_p - s_w)P \quad .....(3)$$

Inequilibrium, saving is equal to investment

i.e. $S = I$

or $I = s_w Y + (s_p - s_w)P$

Now, dividing both sides by Y we get

$$I/Y = s_w + (s_p - s_w)\, P/Y$$

$$\text{or } P/Y = \frac{\left(I/Y - s_w\right)}{\left(s_p - s_w\right)}$$

$$\text{or } P/Y = \left\{\frac{1}{\left(s_p - s_w\right)} \cdot \frac{I}{Y}\right\} - \left(\frac{s_w}{s_p - s_w}\right) \quad .....(4)$$

Equation (4) implies that the proportion of profit out of national income depends on investment in the economy. Higher investment will increase the share of profit in national income. It leads to more saving and capital accumulation in the economy.

Thus, the main contribution of Kaldor's theory is making saving ratio endogenous. Technical progress function is thus considered to be an improvement over the traditional production function and this is Kaldor's most important contribution.

2.9 Summary :

To summarize in this chapter we analysed the various growth theories by different writers starting from the classical approach with economists like Adam Smith, Ricardo, Malthus, J.B. Say and J.S. Mill based on the doctrine of laissez faire advocating stationary state of growth. Marx explained the process of capital accumulation under capitalism and the inevitable collapse of capitalism and replacement by socialism Schumpeterian theory also advocated the replacement of

capitalism by socialism. Harrod-Domar model on the other hand, advocated that for long-run full employment equilibrium actual growth rate (g), warranted growth rate (g_w) and natural growth rate. (g_n) must be equal. Solow, again advocated convergence of per capita income across globe based on the assumption of diminishing returns to capital. Contradiating to this the new endogenous growth theory advocated divergence of per capita income globally by relaxing the assumption of diminishing returns to capital. In alternative growth models we analyzed the Joan Robinson and Nicholas Kaldor. J. Robinson described the need for adoption of mixed economic system by the underdeveloped countries insted of following the capitalist rules of growth. Then it was showed how Kaldor's model provided the core of the new endogenous growth theory of non-diminishing to capital.

2.10 Self Assessment Questions :

1. Explain the classical theory in terms of its key components.
2. Explain how Marx explained the process of destruction of capitalism.
3. How does Harrod define the warranted and natural growth rates? Explain the implications for a country if the natural growth rate exceeds the warranted rate.
4. How is the conclusion reached that investment does not matter for long-run growth? Explain the convergence debate.
5. What is the difference between exogenous and endogenous growth process.
6. Outline the essential proposition of 'new' (endogenous) growth theory.
7. Explain Joan Robinson model of growth.
8. How does Kaldor's model of economic growth forms the basis of endogenous growth theory.

2.11 Additional Readings

1. Ray, bebraj, Development Economics, Oxford University Press, New Delhi.
2. Thirlwall, A.P., Growth and Development : With Special Reference to Developing Economics, Palgrave Macmillan, New York.
3. Todaro, M.P. & Smith, S.C. Economic Development, Pearson Education, Delhi.
4. Mishra, S.K. & Puri, V.K., Economics of Development and Planning- Theory and Practice, Himalaya Publishing House.

Unit 3 : Theories of Development

Structure :

3.0. Introduction :

In the second unit some important theories of economic growth both classical and neo-classical were analyzed. These theories are aplicable to the developed capitalist countries. In the unit, we discuss those theories of development which analyse the characteristics of stable low-level economic development basically applicable to the underdeveloped countries.

3.1 Objectives :

The main objectives of this unit are to analyze the vicious circle of poverty as an explanation of the stable low level economic development of the poor countries. This unit also tries to outline Myrdal's theory of cummulative causation and forwards the essential arguments of the Neo-Colonial Dependence Model. It gives an critical appraisal of the Big-Push Theory of Rosenstein-Rodan. It also describes the essential features of Balanced Growth strategy of Nurkse and Unbalance Growth strategy of Hirchman. Further this unit makes a review of the critical Minimum Effort Theory of Leibenstein.

3.2 Vicious Circle of Poverty Theory :

It was Ragnar Nurkse (Problems of Capital Formation in Underdeveloped Countries) who first used the expression 'vicious circle of poverty' to explain the stable low level of economic development of the Third World Countries. In the words of Prof. Ragnar Nurkoe, "It implies a circular constellation of forces tending to act and react upon one another in such a way as to keep a poor country in a state of poverty."

The foremost obstacle to economic development of under developed countries is the vicious circle of poverty that tend to perpetuate the low level of development. Poverty is a great course. It is not only distressing but de-moralising too. Nurkoe summed up argument of poverty being the cause of underdevelopment by saying "A country is poor because it is poor."

The vicious circle of poverty operates both or demand and supply side. On demand side, low income means low demand, which means low insentive to invest and thus in turn, results in low capital formation, low productivity and low income.

On the supply side, low income of a poor country means low capacity to save. Low capacity to save means low investment which in turn leads to low capital formation, low productivity and low income. Thus, the vicious circle is complete from both demand and supply side.

Fig 3.1(a) : Demand Side

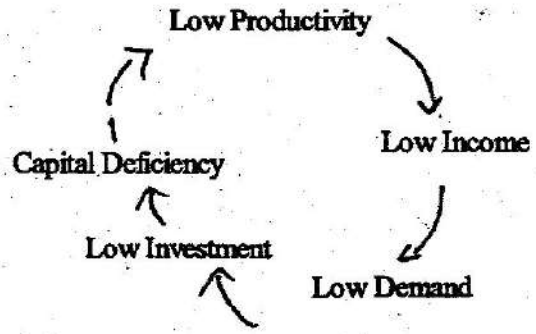
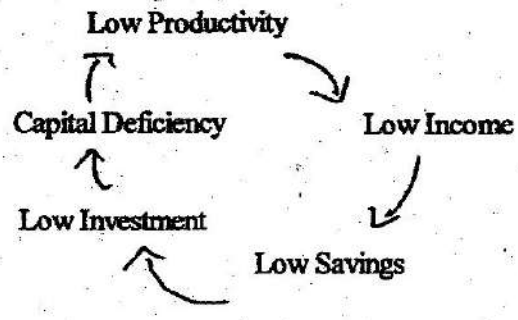


Fig. 3.1(b) : Supply Side



Under vicious circle operated in under developed countries is the under developed human ındnatural resources. The development and availability of natural resources depend upon ability and :fficiency of human resources of the country. Underdeveloped natural resources are the :onsequence and cause of backwardness of the masses. It can be shown as below–

Market Imperfection

↓ ↑

Underdeveloped Nutural Resources

↓ ↑

Illiterate People and Backwardness

As regards, the cause and effect of market imperfections, Prof K.N. Bhattacharya recognise :hat "poverty and underdevelopment of economy are synonymous. A country is poor because it is ınderdeveloped. It is underdeveloped because it is poor and remains underdeveloped as it doesnot have the necessary resources for promoting development. Poverty is a curse but the greater curse is that it is self-perpetuating."

The theory of vicious circle of poverty has been criticized on the following grounds :

1. The theory confuses between low levels of development with low rates of change in output and also between level of saving and rates of saving. The rates are more important for economic growth.
2. Poverty may not be the cause of low rates of savings.
3. Even in poor countries the richer section save a part of the income. But this richer section, instead of saving for economic growth, they may indulge in conspicuous consumption.
4. It ignores the positive role of foreign savings in the form of direct investment for economic growth.

3.3 : The Process of Cumulative Causation : Myrdal

The hypothesis of cumulative causation as an explanation of the backwardness of developing nations is associated with Gunnar Myrdal. It is a hypothesis of geographic dualism, applicable to nations and regions within nations. As against the static equilibrium theory, which predicts that the working of economic forces will narrow spatial differences, Myrdal contends that in context of development both economic and social forces produce tendencies towards disequilibrium. Myrdal replaced the assumption of stable equilibrium with the hypothesis of circular and cumulative causation. He argved that the use of this hypothesis will provide an explanation of international and interregional differences in nations development which persists and even widern over time.

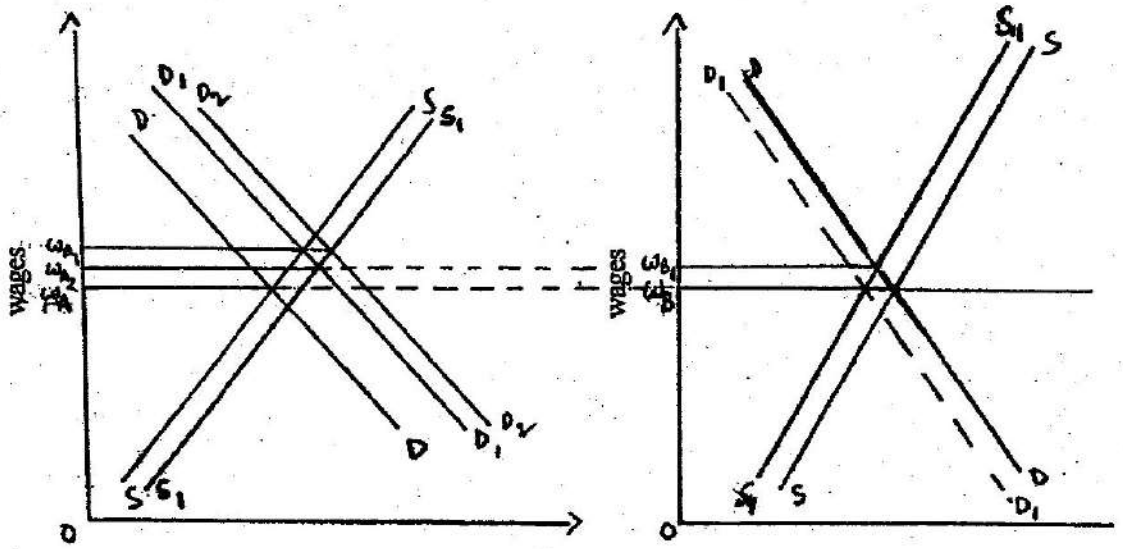
To explain the process of cumulative causation he considers this hypothesis in context of geographically dual economy through labour migration, capital movements and trade. The existence

of dualism not only retards the development of backward regions but the whole economic development process is slowed up.

Let there be a country in which all regions are at same stage of development, measured in terms of same level of per capita income or similar levels of productivity and wages in the same occupations. Let us then assume some exogenous shock produces a disequilibrium situation with one region developing more rapidly than another. The social and economic forces tend to strengthen the disequilibrium situation and leads to the cumulative expansion in the favoured region at the expense of other regions. To Myrdal the cumulative causation process as a multiplier-accelerator mechanism producing increasing returns in the favoured region. So, instead of equality, the forces of supply and demand interact producing cumulative movements away from spatial equilibrium.

Let us illustrate with the help of example and diagram this process. Let there be two regions A and B where the wages are determined by demand and supply as shown in figure below.

Figure 3.2



Demand and Supply for labour

Demand and Supply for labour

Suppose, the wage levels are identical in the two regions, i.e. $w_A = w_B$. Now, let some stimul rise the demand for labour and therefore the wages to rise in Region A relative to Region B. So the demand curve for labour in Region A shifts to D_1D_1 and thus wages rise to w_{A_1}. Due to the wage discrepancy i.e. $w_{A_1} > w_B$ the labourers are induced to migrate from Region B to Region A.

According to the equilibrium theory, the wage levels would have a tendency to be equalized once more through a reduction in labour supply in Region B from SS to S_1S_1 and an increase in labour supply in Region A from SS to S_1S_1, where wage of Region A is equal to wage in Region B i.e. $w_{A_2} = w_{B_1}$.

The hypothesis of cumulative causation, however states that supply would/may react on emand in such a way that it would counteract the tendency towards equilibrium. Migration from egion B depresses the economy of the region through reduction in human capital, entrepreneurs, emand for goods and services and factors of production. On the other hand, migration into Region would stimulate the growth in this region through entriprise and increased demand for goods and ervices and hence factors of production.

So, migration from Region B would cause demand curve for labour to shift to the left i.e. D_1D_1 nd migration into Region A would shift the labour demand curve to further right i.e. D_2D_2. So, the ntial wage discrepancy would persist, if not widen. This Myrdal terms as 'backwash effect' where he cumulative expansion is set in favour of the favoured region causing development differences.

Hirschman recognizes the continued existence of backwash effects and argues that to offset hem, policies must be designed to reduce what he calls the 'polarization' effects and strengthen the trickle down' effect. These 'trickle down' effects are the favourable repurcussions on backward egions from the expanding region and Myrdal calls it the 'spread effects'.

According to Myrdal, the Spread effects are weaker than the backwash effects. So, to narrow lown interregional differences, nations must rely on state intervention through regional policies. The alternative is to wait for the cumulative causation to end naturally which may take a long amount of tyme. Eventually a time will come when expansion and process of migration of migration would be halted and possibly reversed.

Critical Appraisal :

The Myrdal thesis marks an important deparature from other theories of underdevelopment. The national and international forces which tend to keep the underdeveloped countries in the cumulative process where poverty becomes its own cause is beautifully combined.

The spread effects in the underdeveloped countries are dampened by strong backwash effects. National and international forces tend to perpetuate them and thus the regional and international inequalities accentuated. Besides, the free play of market forces and unhampered trade tend to cramp the export potentials of such countries. As a result, a great gap has developed between imports and exports of underdeveloped countries which has made their economic development a costly and lengthy affair.

3.4 : Neo-Colonial Dependence Model

During 1970's, international - dependence models gained increasing support, especially among leveloping countries. Neo-colonial dependence model is one of the general approaches of the three major streams of thought.

Neo-colonial dependence model, is an indirect outgrowth of Marxist thinking. According to this

model, the Third World nations are part of highly integrated and complex international system in which development effects can be nullified by external forces beyond their control. In view of the Neo-Colonial dependence, the existence and continuance of the underdevelopment in the Third World countries is largely due to the historical evolution of a highly unequal international capitalist system of rich country - poor country relationships. This leads to an exploitative system based on unequal power relations between the center (developed countries) and the periphery (less developed countries) making effort to be self reliant and developed difficult and sometimes impossible. Some section of powerful elite in LDCs like landlords, merchants etc. help in perpetuation of the international capitalist system like MNCs, IMF, World Bank, WTO etc. and thereby they are rewarded.

One of the most powerful statements of international dependence model was made by Theotonio Dos Santos. According to him, underdevelopment, far from constituting a state of backwardness prior to captalism is rather a consequence and particular form of capitalist development known as dependent capitalism. Dependence is a conditioning situation in which the economics of one group of countries are conditioned by the development and expansion of others. In this dependent relationship, some countries can expand through self-impulsion while others, being in a dependent position can only expand as a reflection of the expansion of the dominant countries which may have positive and negative efforts. In either way, the basic situation of dependent causes these countries to be both backward and exploited. Dominant countries are endowed with technological, commercial and socio-political predominance over dependent countries.

3.5 : The Stages of Growth-Rostow

W.W Rostow's The Stages of Economic Growth was first published in 1960 with the sub-title "A Non-Communist Manifesto". This theory was an attempt to provide an alternative to the Maxist interpretation of history. Rostow presents a political theory as well as a deocriptive economic study of the pattern of the growth and development of nations.

The essence of Rostow's thesis is that it is Logically and practically possible to identify stages of development. He distinguishes five such stages– (i) traditional society, (ii) transitional or the pre conditions for take off, (iii) take-off, (iv) maturity and (v) high mass consumption.

(i) Traditional Society :

It is based on primitive technology and orthodox ideas. Traditional societies are characterised by a ceiling on productivity imposed by the limitations of science. As such a high proportion of the workforce is dependent on the subsistence agriculture along with very little mobility or social change, great divisions of wealth and decentralized political power. Thus the society is based on feudalism.

(ii) Transitional or the Pre-conditions for take off :

The stage between feudalism and take-off is what Rostow calls the transitional stages. This is the stage where the societies are in the process of transition building up conditions which enables them to take-off in due course of time.

According to Rostow, transition has many dimensions. First, a podominant agrarian society should attempt to transform itself into a industrial society. Second, the trade and commerce should not remain localised. Third, the surplus of income over the necessary consumption should not be used for conspicuous consumption. Finally, a society should overcome the natural constraints through hard work and ingenuity.

Economists often assert that the strategic factor in the transition phase is the level of investment which should be raised at least 10 per cent of national income to ensure self-sustaining growth. According to Rostow, capital formation is generally facilitated by an increase in the productivity in agriculture and the creation of social overhead capital. Both agricultural productivity and building up of social overhead capital plays a crucial role in the transitional process between a traditional society and a successful take-off. In this period the economic changes are accompanied by changes in both social values and political structure and motivations.

(iii) The take off :

The take-off is a decisive stage in the evolution of any society. It is the stage in which growth becomes a normal condition of the society. However, the characteristics of take-off are sometimes difficult to distinguish from the characteristics of the transition stage. This has been a bone of contention between Rostow and critics. Rostow was aware of the definitional problem in context of take-off and therefore defines it as the requirement of the following three conditions :

(a) a rise in the rate of productive investment;
(b) the development of one or more substantial manufacturing sectors, with high rate of growth;
(c) the existence or quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector.

With this definition of take-off Rostow Sought to isolate a period when industrialisation assumes a critical role and prepares ground for future largescale structural transformation. However, the society's evolutionary process in the take-off stage of growth does not follow a single route. The take-off requires substantial amount of loanable funds and also presence of a group of enterprising people in the society who can carry out innovation and thereby produce growth.

(iv) Maturity :

The stage of maturity/drive to maturity is defined by Rostow as the period when a society has effectively applied the range of modern technology to the bulk of its resources. The period witness

expansion and diversification of industrial development, with new leading sectors replacing the old. Accompanying changes in the industrial structure will be structural changes in society, such as changes in the distribution of the workforce, the growth of an urban population etc. Maturity also has important political features and other non-economic aspects of maturity making on economy grow an gain international importance.

(v) High Mass Consumption :

With maturity a society begins to take economic abundance for granted. In this post maturity stage people seek more leisure, more welfare and social security etc. The society's attention thus shift from the problems of production to problems of consumption and welfare. The country allots more resources for achieving international recognition, external power and influence and even world leadership.

It is a welfare state which execute redistribution of income through progressive taxation, makes provision, of ample leisure and social security to working class, free education aid to weaker section.

However, the era of high-mass consumption has nowhere come to an end, no even in United States. So, what lies beyond the stage of high-mass consumption is a difficult question to answer.

Criticisms :

1. The sequence of growth has no historical basis. There is no single sequence which fits the history of all countries.
2. 'Take-off' is the most controversial concept as it has no time an place reference. The rate of speed at which the economy grows to overcome ground inertia to become self-sustaining varies from country to country.
3. Rate of a leading sector with high Growth rate cannot be ensured as its development is not simple.
4. Emergence of political, social and institutional framework so necessary for growth cannot be taken for granted.
5. There is a confusion in the concept of maturity. It clearly doesnot identify whether use of modern technology is a result of development or cause of development.
6. Age of High Mass Consumption has no special significance. Preference to consume among people is found at every stage.

3.6 : Big - Push Theory - Rosenstein - Rodan :

The theory of Big - Push envisages on a large sacle investment as a pre-requisite for putting the less developed economics on to the growth puth. The strategy, advocated by many, was first conceived by Rosenstein-Rodan in the early forties. The stragey is a contrast to the approaches

suggesting gradual and small steps towards development. On the contrary it suggests concentrated efforts in the form of investments on a large scale to make a still and backward economy move.

One of the basic feature of this strategy is its big endeavour in industrialising a predominantly agricultural economy and that too in the intial stage. The strategy has no faith in bit-by-bit growth over long period. The core of the strategy is to make large scale investment over a short period to make the desired and required impact on the economy.

Another feature of the big-push strategy is that of investments in varied industries, rather than to one or a few. Such investments in complementary industries will there create its own demand. The strategy also favoured planned industrialisation within the frame of world economy, rather than closed economy. Thus, the thrust of the strategy lies in making a big-push through concentrating large investments as if in one package.

According to Rosenstein-Rodan, the need for big push in underdeveloped countries arises from three indivisibilities related to the external economics. The indivisibilities are–

(a) indivisibility in the production function

(b) indivisibility of demand.

(c) indivisibility in the supply of savings.

(a) Indivisibility in the production function :

According to Rosenstein-Rodan, in divisibilities of inputs, processes, or outputs give rise to increasing returns, and may require a high optimum size of a firm. Investment in social overhead capital (SOC) however are very lumpy in nature and require substantial intial investment and the gestation period is also long for such investments. Besides, services of social overhead capital cannot be imported, heavy intial investment is therefore required in social over head capital.

(b) Indivisibility of Demand :

One of the important argument is based on indivisibility characteristics of demand. It is in the sence that demand for various goods and services are complementary in nature, since people demand varioud products at one and the same time. So, what is required is the setting up of a large number of industries simultaneously so that people may become each others consumers and the output of all them may be sold. This in turn will reduce the risk of finding markets for the products. Setting up any one industry, say shoe industry, will not help, because workers engaged in that industry will not spend their entire income on the purchase of shoe alone.

(c) Indivisibility in the Supply of Savings :

Substantial investment in a number of industries at one and the same time requires a substantial level of savings. So, it is necessary to overcome the indivisibilities on the supply side. The raise the

level of savings it is necessary that when income increases due to an increase in investment, mechnisms must be provided to raise the marginal rate of saving in the second stage substantially in comparison to the average rate.

Role of State

The theory of the big push assigns a crucial role to the state. The amount and scale of investment for heavy industrialization is beyond the means of the private sector. So, investments in lumpy projects like social overhead capital with long gestation period is to be borne by the state since private sector is guided by profit motive and therefore would not undertake such investments.

Criticisms :

1. The bigh push theory fails to recognize the important fact that the amunt of resources in underdeveloped countries is very much limited. There is dearth of critical factors like entrepreneurship, skilled labour, capital, saving and structural and industrial factors.
2. There is danger of inflation, as big push strategy leads to the development of social over head cost and complementary industries having longer gestation period and increasing employment and money income.
3. Governments of the underdeveloped countries are likely to encounter serious difficulties in execution and implementation of the various projects according to a planned programme.
4. The theory neglects importance of techniques in its over enthusiasm for capital formation.
5. Big-push creates external diseconomics in the short-run, as many of the critical factors have to be procured at a higher cost.
6. By emphasizing on social overhead cost and industrial development, it ignores agricultural development.
7. The benefits of employment and income generation are denied by ignoring the possibilities of small investment.

3.7 : Balanced Growth Strategy - Nurkse

The Balanced Growth Strategy is associated with Ragnar Norkse. The strategy aims at a growth that moves along a balanced path. This strategy emphasises the need for simultaneous development of a number of lines of production because of the complementarity character of industries. There are different interpretations to the implication of balanced growth. Balanced Growth means balance between–

a. Different consumer goods industries;

b. Capital goods and consumer goods;

c. Industry and agriculture;

d. Domestic and exports sector;

e. Economic and Social overhead and directly productive investment. .

According to Nurkse, the limited size of the market is the main obstacle to economic development and in order to overcome this problem there has to be all-round improvement in the productivity. The inducement to invest is limited by the size of market due to lack of purchasing power. The necessary market can be expanded by investment in complementary industries. The vicious circle of poverty can be broken by "more or less synchrohized application of capital to a wider range of different industries". This will create demand for each other's commodity. There will be overall enlargement of market which will provide necessary inducement to invest. According to Nurkse, the difficulty caused by the small size of the market relates to individual investment incentives in any single line of production taken by itself. In principle, the difficulty vanishes with more or less synchronized application of capital to a wide range of different industries. Here is an escape from the deadlock and results in overall enlargement of the market. Most industries catering for mass consumption are complementary in the sense that they provide a market for and thus support, each other.

Thus the case for balanced growth rests upon the relation of complementary between wants, between factors and between factors and products at various stage of production.

Criticisms :

1. Balanced growth doctrine is not suitable for underdeveloped countries because of acute shortages of capital, technical skill, managerial talent, skilled labour, power, transport, raw materials etc.
2. Simultaneous establishment of a number of industries will raise the real and money cost of production and make them economically unprofitable to operate. The new industries will complete with old ones for supply of the scarce factors of production.
3. According to Prof Singer, balanced growth doctrine is based on wrong assumption that an underdeveloped country starts from a scratch in reality, every underdeveloped country starts from a position that reflects previous investment decisions and previous development. As such there may be highly desirable investment programmes which may not be balanced in themselves.
4. Another difficulty about balanced growth doctrine arises due to lack of proportionality in the supply of factors of production. It is a big hindrance in the application of doctrine of balanced growth.
5. The doctrine of balanced growth presumes the effectiveness of government direction and co-ordination of centralized planning and direction. But such an assumption is wrong.
6. Besides historical evidence does not support balance growth doctrine. In most of the developed countries the process of development has not been balanced.

3.8. : Unbalanced Growth Strategy - Hirschman

The proponents of unbalanced growth strategy argue that since the underdeveloped countries suffer from scarcity of resources and so cannot launch upon a balanced growth programme. The foremost exponent of the Unbalanced Growth strategy is Hirschman. The strategy aims at growth of the less developed countries along a path that is marked by imbalances.

Hirschman contends that deliberate unbalancing of the economy according to a pre-designed strategy is the best method of development. Unequal development of various sectors often generates conditions for rapid development. The situation that some industries are more developed than others, provides an inducement to grow to not so developed industries. Hence, development policy of an underdeveloped country should be based on this reality.

In the words of Hirschman, "Development is a chain of disequilibria that must be kept alive... If the economy is to be kept moving ahead, the task of development policy is to maintain tensions, disproportion and disequilibria". Hirschman illustrates his strategy by taking up the relation between two broad categories of activities, namely Social Overhead Capital or SOC for short and Directly Productive Activities or DAP for short.

The SOC concerns investment in transport, communications, water supply etc. The DAP includes production of goods for direct use like clothing, shoes, radios etc. Investment in either SOC or DPA causes an imbalance in the economy.

If the intial investment is made in the SOC, there will be excess of its products. This may reduce their prices and will amount to subsidisation of the DPA. This will induce investment in DPA in expectation of profits. However, if the initial investment is made in DPA, there will be shortage of the SOC products. In this case, there will be political pressures on government to respond to the shortage through investment in the SOC.

To explain these relations between SOC and the DPA Hirschman uses the following production-function diagram.

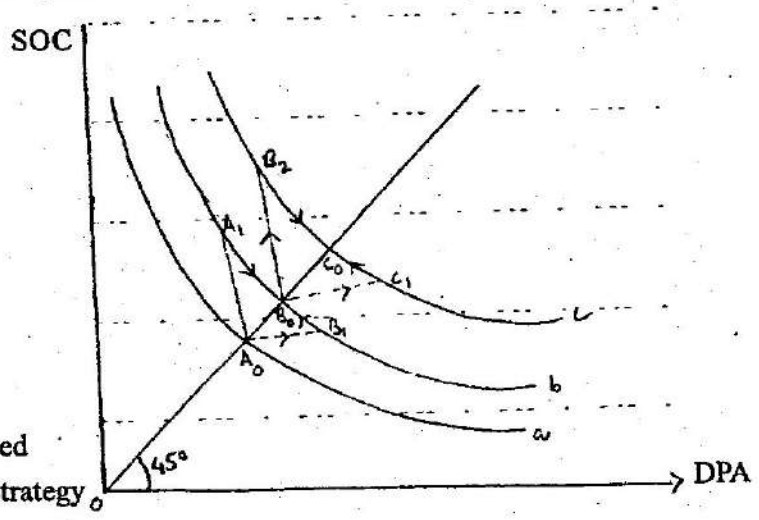


Fig 3.3 : Unbalanced Growth Strategy

Units of new investment in SOC are measured onthe vertical axis and units new investment in DPA are measured on the horizontal axis. The curves show various quantities of SOC and DPA which give the same gross national product at any point of time. The further away the curve from the origin higher is the gross national product.

In case the SOC is to lead the growth, the economy will move along the line $A_0 A_1 B_0 B_2 C_0$. Here the SOC increases from A to A_1 inducing DPA to increase until balance is attained at B_0. This places the economy at a higher level of output, and SOC increase to B_2. In response to this, DPA also increase to C_0. If DPA is to lead the process, the economy will follow the dotted line $A_0B_1B_0C_1C_0$.

Criticisms :

1. Unbalanced growth involves a considerable wastage of excess capacity. Under utilization of capacity continues till other sections develop.
2. The doctrine pays inadequate attention to the composition, direction and timing of imbalance.
3. It concentrates on stimuli to expansion, but neglects resistances caused by unbalanced growth.
4. It may create inflationary pressures as a result of heavy investment in some sectors thus increasing money income and demand for consumer goods against stagnant supply.
5. Hirschman's strategy pots emphasis on SOC and capital goods industries at the expenses of consumer goods industries which puts extra burden on the consumers.

To conclude, it can be said that in the intial stage, unbalanced growth is inevitable. In the long run the question is just to decide the degree and nature of imbalance.

3.9 : Critical Minimum Effort Theory - Leibenstein

The strategy emphasises the need for making an amount of investment which is the minimum effort required for polling up a backward economy to a higher growth plane in the face of rising population. The basis of the strategy revolves around the relation between population-growth and economic growth.

The strategy is designed to meet the situation of Malthusian underemployment equilibrium. This situation is characterised by low per capita income and constant population growth-rate due to high birth rate and a high death rate. Thus, the economy is fated to remain at the subsistence-level. Children are looked upon as agents of production and for old age security. However with the increase in per capita income people see small families as an advantage in terms of high economic and social status. Thus, the strategy aims at raising the per capita income sufficiently so that the growth rate of population may decline.

In terms of the above argument, the strategy envisages efforts in the form of large income-generating investments. In the absence of such an effort or smaller efforts, the per capita income will

relapse to its original low position because of a rise in population. So, the intial effort has tobe large enough such that it yields an income gain and the growth rate of population starts declining. So, the basic element of the strategy is adequacy of investment; and this is for two reasons first, the growth rate of population in these countries is large at over 2 to 2.5 percent and even more. So, the per capita income requires that the economic growth should not only exceed the population growth-rate but also should be substantially higher so that the rise in per capita income makes an impact on population-growth that is sufficiently large. Second, the intial investment has to be large enough particularly in the LDCs to overcome the indivisibilities in respect of many projects.

Given the adequate intial effort, the growth process envisaged in the strategy or income raising forces become operative. Growth agents like the entrepreneur, investor etc. are activated, to enhance the growth process.

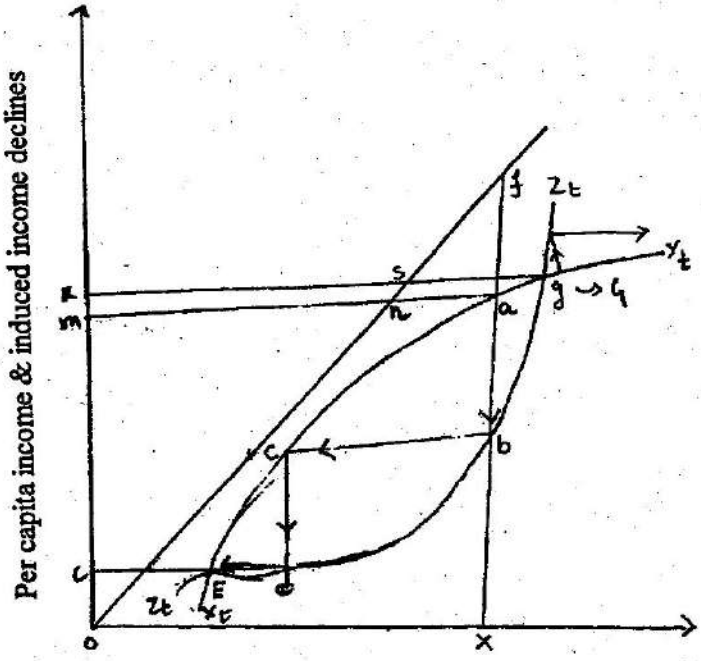


Figure 3.4

In the figure curve X_tX_t represents all income raising forces and Z_t Z_t indicates all income depressing forces. The 45° line measures induced increases and decreases in income. E is the original point of equilibrium.

If now an intial investment raises percapita income from the equilibrium level 'oc' to 'om', then the income raising forces raise per capita income by 'na'. All this level of income the income raising forces are 'af' and income depressing forces are 'bf'. Since 'bf' is greater than af, the income

generation will follow backward path 'abcd' back to the original equilibrium point E. However, if the initial investment raises the per capita income to the level of ok, then per capital income will rise by sg. So, from point G the income generating forces will put the growth on the path of endless expansion of per capita income.

Criticisms :

1. Relation between per capita income and population growth is not a simple matter. According to Leibenstein, population increases as a result of rise in income above subsistence level. Rise of income has a direct bearing on population growth. But in UDCS population is not merely influenced by per capita income but other factors too. So, the thesis is more relevant in western countries.
2. The relation between level of per capita income and the growth of total income is more complicated than what has been assumed by Leibenstein.
3. The doctrine does not take into consideration the rate of foreign capital in increasing the level of saving and investment for accelerating the economic growth in UDCs.

3.10 : Summary :

In this chapter we have analysed important theories of economic growth applicable mainly to the UDCs. The 'Vicious Circle Theory' seeks to explain how poverty is the cause of poverty. Myrdal's thesis of 'cumulative causation' stresses upon the relative strength of backwash and spread effects as an explanation of aggravating economic inequalities amongst countries and regions within a country. Then the Neo-Maxist view in the form of 'Neo-Colonial dependence model' analyses the causes of underdevelopment of the Third World countries. Rostow in his 'Stages of Growth' Theory shows how 'take-off' into self sustaining growth can be achieved by an increase in the saving and investment rate. Rosenstein - Rodan in his 'Big Push' theory stressed on bigh push that is headed to overcome the original inertia of a stagnant economy. Similarly Nurkse's 'Balanced growth' theory advocates simultaneous development of various sectors as a development strategy. On contrary to this Hirschman's 'Unbalanced Growth' doctrine emphasises on the concentration of investment in certain strategically selected industries as a means of achieving economic development in the UDCs. Leibenstein on the other hand believed that a critical minimum effort is necessary to free the economy from the grasp of vicious circle of poverty.

3.11 : Self Assessment Question :

1. What is vicious circle of poverty?
2. Explain Myrdal's thesis of cumulative causation.
3. Give the gist of the neo-colonical dependence model.

4. What are the various stages of Rostows growth model? Explain.
5. Give the main thrust of the Big-Push Theory.
6. How does Balanced Growth strategy differ from Unbalanced Growth Strategy? Explain.
7. Explain Leibensteins Theory.

3.12 Additional Readings :

1. Ray, Debraj, Development Economics, Oxford University Press, New Delhi.
2. Thirlwall, A.P., Growth and Development : With Special Reference To Developing Economics, Palgrave Macmillar, New York.
3. Todaro, M.P. & Smith, S.C. Economic Development, Pearson Education, Delhi.
4. Mishra, S.K., & Puri, V.K., Economics of Development and Planning-Theory and Practice, Himalaya Publishing House.

Unit 4
Development from Dual Economic Structure

Structure :

4.0 Introduction :

This unit deals withthe theories of unlimited supply of labour and the dual Economy models forwarded by Lewis, Fei & Ranis and Harris – Todaro. It deals with the dualistic growth models where labour in a gadual process is transferred from the labour surplus sector to other sectors and thus in the process intiates growth.

4.1 Objectives :

On reading this unit student should be able to–

- Identify the various dualistic models.
- Distinguish the approaches used by various economist while dealing with dual economy.
- Distinguish the models used by Lewis, Fei-Ranis and Todano.

4.2 Unlimited Supply of Labour and The Dual Economy Models :

This section gives the dualist approach of economists like Lewis, Fei-Ranis and Todar on the unlimited supply of labour while Lewis explained how unlimited supply of labour can conviniently turned into an asset of economic development, Fei Ranis tried to explain his model in terms of agricultural growth. Harris-Todaro viewed rural-urban migration as a favourable in the process of economic development. A brief explanation of these models are presented below.

4.2.1 Lewis Modelof Economic Growth

One of the best known theoretical models of development that focused on the structural transformation of a primarity subsistence economy was formulated by Nobel laureate W. Aurther Lewis in the mid-1950s. Lewis two-sector model tried to explain how unlimited labour supply can be converted into an asset can be converted into an asset for economic development.

Lewis divides the economy of an underdeveloped country in two sectors : a traditional, overpopulated rural subsistence sector characterized by zero marginal productivity of labour and a high-productivity modern urban industrial sector. According to Lewis the rural subsistence sector contains surplus labour which can be gradually transferred to the urban industrial sector for its expansion. A large component of the unlimited supply of labour is composed of those in form of disguised unemployment or in casual old and petty jobs. So, the wages paid by the expanding capitalist sector has to pay to the unskilled labour is determined by what the labour earns in the subsistence sector.

While tracing the process of economic expansion, Lewis emphasized that the key to the entire process is the use of the capitalists' surplus. Captalists' surplus is generated when transfer of surplus labour takes place from the subsistence sector where the marginal productivity of labour is quite low, to the capitalist sector where the wages are high and marginal productivity of labour is also high. The capitalist surplus is again re-invested in new capital assets by the entrepreneurs which leads to capital formation in the economy. This investment in turn creates new job opportunities for the unemployed labourers withdrawn from the subsistence sector.

This process can be illustrated with the help of the following figure.

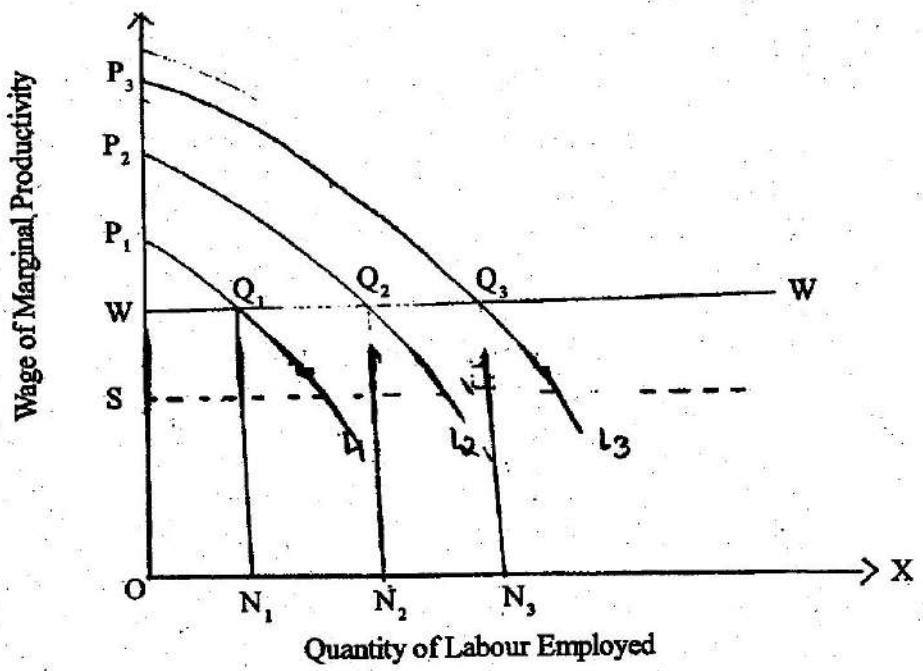


Fig 4.1 – Lewis Model of Unlimited Supply of Labour

On the figure OS is the wage rate in the subsistence sector and OW is the wage in the capitalist sector. At OW wage rate the supply of labour is unlimited as indicated by line ww. When ON_1 labour is employed in capitalist sector, its marginal productivity curve is P_1L_1 and total outputis $OP_1Q_1N_1$. The wages paid to workers is equal to area OWQ_1N_1. So, WP_1Q_1 is the capitalis surplus or total profit which is re-invested. With re-investment the marginal productivity curve shifts upward to P_2L_2. The capitalist surplus and employment are larger than before as WP_2Q_2 and ON_2. The surplus is further re-invested and marginal productivity curve shifts to P_3L_3 with employment ON_3 with surplus of WP_3Q_3.

The process of economic expansion continues as long as there is surplus labour is the subsistence sector. Savings play an important part in the growth process. If the capitalists donot invest a larger and larger portion of their profits neither the total product nor the employment oportunities will increase. Besides Lewis also opines that in underdeveloped countries capital formation is not only out of profit but also of bank credit. It would help create both output and employment opportunities and the surplus labour would be put into use.

However, the process of economic growth cannot go on indefinitely. It comes to an end when the surplus labour from the subsistence sector is totally absorbed by the capitalist sector. As a result the surplus generated because of unlimited suply of labour in underdeveloped countries especially starts decreasing and ultimately vanishes. The rate of capital formation is reduced and economic growth is checked.

4.2.2 Fei-Ranis Model of Economic Growth–

Another model of dualism was developed by John C.H. Fei and Gustav Ranis. They also considered a labour surplus economy where a large primitive agricultural sector co-existed with a small but hopefully growing industrial sector. This model is essentially an improvement over Lewis' theory on the ground that the latter failed to present a satisfactory analysis of growth of the agricultural sector.

The agricultural sector characterised by the existence of over population leads to diminishing increments in agricultural output. This results in redundancy in agricultural labour force. Fei and Ranis argued that these disguised unemployed workers in agricultural sector can be an effective source of labour supply to the industrial sector. So, Fei and Ranis analyse development of labour surplus economy into three phases.

I. In phase one, the redundant labour is transferred to the industrial sector at the constant institutional wage.

II. In the second phase, agricultural workers produced less than the institutional wage they get but add to the agricultural output. Such workers are also shifted to the industrial sector. Eventually a point will be reached where the farm workers produce output equal to institutional wage.

III. The third phase marks the end of the take-off and the begining of self sustained growth where the farm workers produce more than the institutional wage they. This is the phase where the surplus labour is exhausted and the agricultural sector becomes commercialised.
This proces of development is explained with the help of figure below.

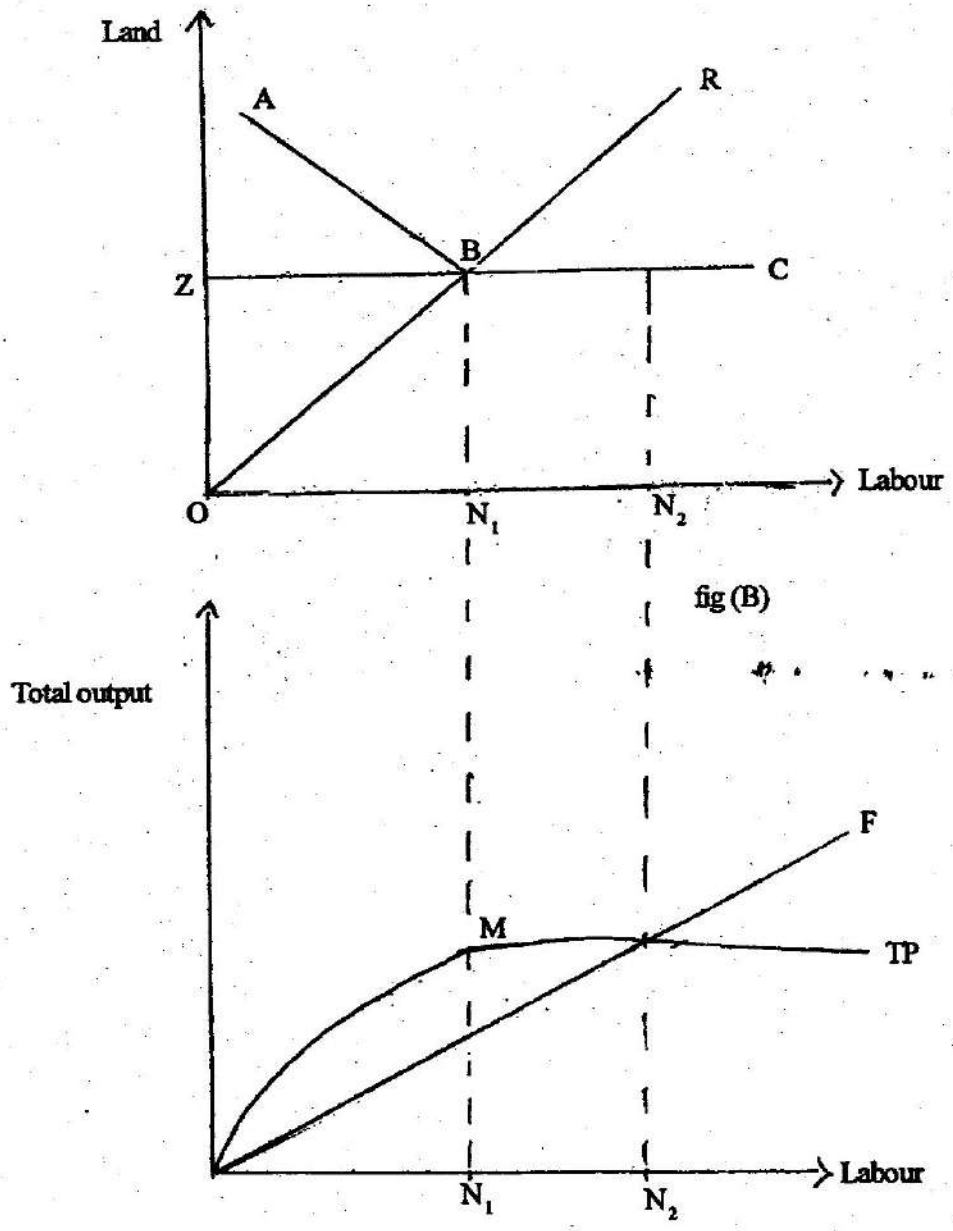


Fig 4.2 (a)

In the above diagram, in figure (A), labour is measured along the horizontal axis and land on vertical axis. OR depits the stuge of production and the curve ABC the production of agricultural goods. Assuming land to be fixed at OZ_1 ON_1 amount of labour produces maximum output.

TP curve represents the total productivity of labour in fig (B) which measures total product along vertical axis. Beyond ON_1 units of labour with OZ amount of land, production would not increase. Beyond point M on the TP curve, the total productivity of labour becomes constant. If ON_2 is the total labour force in the agricultural sector then ON_1 is the non-redundant labour and N_1N_2 the redundant labour force whose marginal physical productivity (MPP_2) approaches zero, beyond point M on the TP curve. Such workers are disguised unemployment.

Economic development is intiated when these surplus workers are shifted from agricultural sector to the industrial sector. The three phases are explained in the figure below as figure (C), (D) and (E).

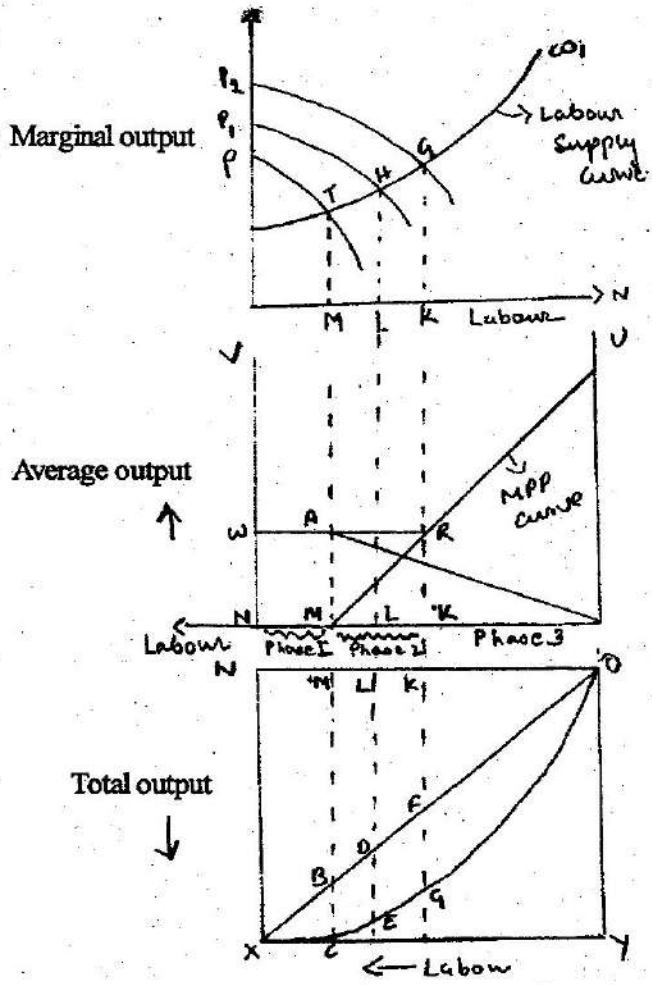


fig (C)

fig (D)

fig (E)

fig 4.2 (b)

In the diagram, in the figure (E) the labour force in agricultural sector is measured on an inverted scale (i.e. from right to left) on the horizontal axis ON; and agricultural output downward from O on the vertical axis OY. OGX is the total physical productivity curve TPP (inverted OTP curve of fig (B)} of the agricultural sector. The portion CX shows that total productivity is constant in this region so that the marginal productivity of MN labour is zero. This represents the surplus labour that can be with drawn. If NX is the output produced by total labour force ON then NX/ON represents the institutional wage.

In the figure (D), the allocation process in three phases the take off stage is depicted. The total labour force is measured from right to left on the horizontal axis ON and the average output on vertical axis NV. The curve NMRU is the MPP_L in agriculture and NW PS the institutional wage at which workers are employed. In phase I, NM workers are disguised unemployed whose marginal physical productivity is zero. So, this redundant labour force NM is transferred to the industrial sectors OM in figure (C) at the same institutional wage OW (= NW).

In phase II, MPP of agricultural workers MK is positive in the range MR of NMRU curve, but is less than institutional wage KR (= NW) they get, as shown in panel (D) of the diagram. These workers are also shifted to industrial sector. But the nominal wage in the industrial sector is not equal to the institutional wage. This is due to the fact that agricultural output declines with the transfer of labourto the industrial sector. When phase II begins, agricultural workers produces output equal to the institutional wage and ultimately more. This marks the end of takeoff stage and beginning of self-sustained growth. This is shown by the rising portion of RU of the MPP curve in figure (D) which is higher than the instutional wage KR (= NW). So, KO amount of labour will be shifted from agriculture to industry at a rising nominal wage above KG in figure (C). This leads to exhaustion of surplus labour in agricultural sector which becomes fully commercialised.

Fei-Ranis analysed the interaction between the agricultural sector and industrial sector in the process of economic development. It shows the importance of agricultural product in capital accumulation in the under developed countries.

4.2.3 The Harris – Tadaro Model of Migration and Unemployment :

Rural-urban migration was viewed as favourable in the process of economic development. Internal migration was considered to be a natural process in which surplus labour from the rural sectors was gradually withdrawn to provide the needed manpower for urban industrial growth. This process was considered as socially beneficial because human resource with zero marginal product was shifted to locations where their marginal product was not only positive but also growing due to capital accumulation and technological progress.

With the asumption that migration is primarily an economic phenomenon, the Todaro model postulates that migration proceed due to the urban-rural differences in expected income rather than

actual earnings. The members comprising the labour force, both actual and potential, compare their expected income in the urban sector with prevciling average rural income in a given time horizon. They migrate if the former exceeds the later.

For instance, let us consider that the average real income in the ruaral area is 50 units for a farm workers. On the other hand for a worker with same skill as the farm worker the annual real income is 100 units. In a full employment environment, the decision to migrate is based on the desire to secure highest-paid job wherever available. This would lead to reduction in wage differentials through the interaction of the demand and supply forces, in areas of both emigration and immigration.

So an individual while deciding to migrate must balance the probabilities and risks of being unemployed or underemployed for a considerable period of time against positive urban-rural real income differential. If the actual probability of securing higher paying job in one period time horizon is one chance in five i.e. 20% then his expected urban income would be 20 units and not 100 units that an urban worker would expect to receive in a full-employment environment. In such a situation the decision to migrate would be irrational. However if the probability of success were 60%, then his expected urban income could be 60 units in one period time horizon. Under such circumstances the decision to migrate would be entirely rational, even though urban unemployment may be extremly high.

Thus, as long as the present value of the net stream of expected urban income over the migrant's planning horizon exceed that of the expected rural income, the decision to migrate is justfiable. This essence of the Todara model is depicted in the figure below.

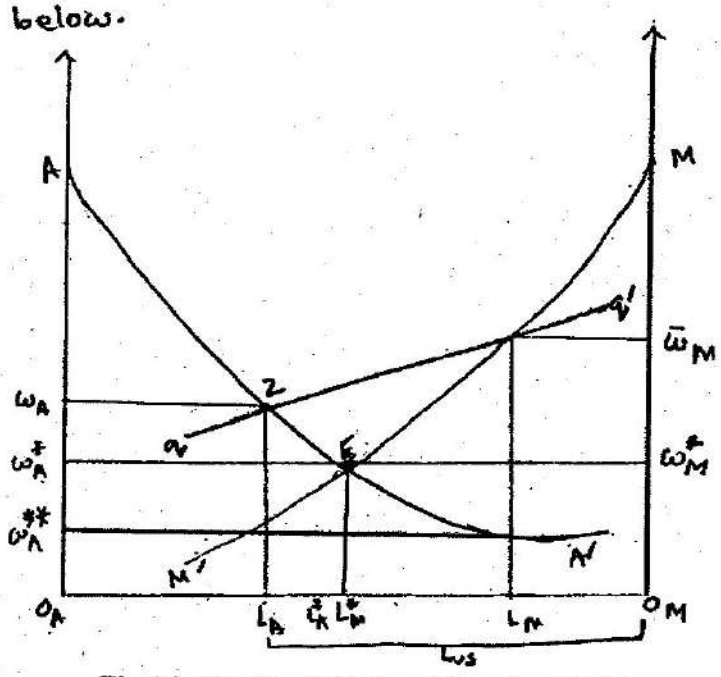


Fig 4.3–The Harris Toduns Migration Model

In the figure two sectors namely the rural agriculture and urban manufacturing is assumed. AA' gives the demand for labour (marginal product of labour curve) in agriculture. Labour demand in manufacturing is given by MM'. The total labour force is given by $O_A O_M$ line. In a neo-classical full employment market economy the equilibrium wage rate would be established at $W_A^* = W_M^*$ with $O_A L^*_A$ workers in agriculture and $O_M L_M^*$ workers in manufacturing. Thus everyone is employed.

However, when there is no unemployment $O_M L_M$ workers would get urban jobs and the rest $O_A L_M$ would be employed in rural area at $O_A W_A^{**}$ wage rate. So, the urban-rural rural wage gap would be $\bar{W}_M - W_A^{**}$, where $\bar{W}_M$ is the urban wagerate that is institutionally fixed. The rest, $O_M L_A - O_M L_M$ workers are either unemployed or engaged in low-income informal sector activities. This explains the existence of urban unemployment and the private economic rationality of rural-to-urban migration despite high unemployment.

Thus, Todaro migration model passes the following basic characteristics–

1. Migration is primarily a rational economic considerations of relative benefits and costs both financial and psychological.
2. The decision to migrate depends on expected rather than actual urban-rural real wage differentials.
3. The probability of obtaining an urban job is directly related to urban employment rate and inversely related to the urban unemployment rate.
4. Migration rates in excess to urban job opportunity growth rates is both rational and possible and even likely in the face of wide urban-rural expected income differentials.

Check Your Progress :

1. Give the essence of Lewis model of unlimited labour supply.
2. State the basic essence of Fei-Ranis model.
3. What according to Ioduro is the reason for rural-urban migration.

4.3 Summary :

This unit deals with dual economic structure and tries to show how unlimited supply of labour can stimulate growth. Basically three models namely Lewis model of economic growth, Fei-Ranis model and Todaro model of migration is identified. Lewis focused on the structural transformation of the primary subsistence economy. At the same time Fei-Ranis idenfied the disguised unemployed workers in agricultural sector as an effective source of labour supply to the industrial sector in the process of development. Tadaro on the other hand opined that migration from rural to urban sector finally intiates development. People migrate if there is difference in the urban-rural expected income.

4.4 Self Assessment Questions :

1. Critically explain the Lewis theory of unlimited supply of labour.
2. How is Fei-Ranis model an improvement over Lewis model? Critically explain the model.
3. State the conditions under which a labourer would migrate from rural to urban areas. How does Tadaro explain this phenomenon?

4.5 Additional Readings :

1. Ray, Debraj, "Development Economics", Oxford University Press, New Delhi.
2. Thirlwall, A.P., "Growth and Development : With Special Reference To Developing Economics", Palgrave Macmillan, New York.
3. Todaro, M.P. & Smith, S.C. "Economic Development", Pearson Education.