UNIT 3 INTRODUCTION TO GROWTH MODELS*

Structure

3.0 OBJECTIVES

After going through the unit you will be able to:

- Explain the concept of economic growth ,development and growth models;
- Describe the background and evolution of growth models;
- Identify the sources of growth in various models of growth; and
- Discuss the structure of the various growth models

3.1 INTRODUCTION

Economic growth is the study of the causes and consequences of sustained growth in real GDP per person. One can define economic growth as the increase in the inflation-adjusted value of the goods and services produced by an economy over time. Economists refer to an increase in economic growth caused by more efficient use of inputs that is labour, capital, land etc. as intensive growth. GDP growth caused only by increases in the amount of inputs available for use (increased population, or new machinery) counts as extensive growth. The "rate of economic growth" refers to the geometric annual rate of growth in GDP over a

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period of time. This growth rate represents the trend in the average level of GDP over the period, and ignores any fluctuations in the GDP around this trend. Economic Development is a much wider concept in terms of scope vis-a-vis growth and is defined as a combination of social, economic and institutional processes that secure the means for obtaining a better life. It should be perceived as a multidimensional process involving the reorganisation and reorientation of economic and social systems.

While economists in the 20th century viewed development primarily in terms of economic growth, sociologists instead emphasized broader processes of change and modernization. Development and urban studies scholar Karl Seidman summarizes economic development as "a process of creating and utilizing physical, human, financial, and social assets to generate improved and broadly shared economic well-being and quality of life for a community or region". Daphne Greenwood and Richard Holt distinguish economic development from economic growth on the basis that economic development is a "broadly based and sustainable increase in the overall standard of living for individuals within a community", and measures of growth such as per capita income do not necessarily correlate with improvements in quality of life. Economic development is a wider concept and has qualitative dimensions. Economic development implies economic growth plus progressive changes in certain important variables which determine well-being of the people, for example, health and education.

Economic development is the primary objective of the majority of nations across the world. The universal features of economic development-health, life expectancy, literacy and so on-follow in some natural way the growth of per-capita GNP. If we see it as purely economic, we can say it is synonymous to Economic growth. But in addition to rising income it implies fundamental changes in the structure of the economy as well. Economic growth is one of the most important notions in the global economy. Despite the criticism that the level and rate of growth does not always reflect the real level of a population's living standards, it remains the primary measure of prosperity. However, as a measure describing the dynamics of economic processes in the country it has some drawbacks. First, it does not record the volume of production obtained from the informal market, known as the "black market", which means that not all economic transactions are included in the total volume of generated output. In addition, economic growth does not take into account changes in the amount of time spent on work, which obviously affects the welfare of society. Also the measure of economic growth does not include the negative processes associated with economic activities, such as environmental pollution, its progressive degradation, or noise pollution. However, despite all these drawbacks economic growth remains the primary measure of the socio-economic conditions of the citizens of a country. A model of economic growth is based on economic theory to establish basic fundamental assumptions that allow proposing an interaction between the factors of production in order to explain the determinants of economic growth. The principal theories of economic growth include:

Mercantilism-At the beginning of the Industrial Revolution , wealth of a nation was determined by the accumulation of gold and running trade surplus. It was not a growth theory but argued that a country would be better off by accumulating gold and by increasing exports.

Classical Theory- Adam Smith with whom the classical school started placed emphasis on the several factors which enable increased economic growth:

a) Role of markets in determining demand and supply.

b) Productivity of labour that is the state of the skill, dexterity and judgement with which labour is applied in any nation.

c) Role of Trade in enabling greater specialisation.

d) Role of increasing returns to scale.

While David Ricardo developed the classical model that assumed technological change as constant and increasing inputs that could lead to diminishing returns, Thomas Malthus could notthe capacity of technological improvements to increase food yields .The theory states that food production will not be able to keep up with growth in the human population, resulting in disease, famine, war, and calamity .

Neo-Classical Theory- Neoclassical growth theory is an economic theory that outlines how a steady economic growth rate results from a combination of three driving forces—labor, capital, and technology.

Endogenous growth theories- The Endogenous Growth Theory states that economic growth is generated internally in the economy, i.e., through endogenous forces, and not through exogenous ones. The theory contrasts with the neoclassical growth model, which claims that external factors such as technological progress, etc. are the main sources of economic growth.

Keynesian Demand side Theory: Keynes criticised the Classical school of thought and argued that Aggregate Demand could play a role in influencing economic growth in the Short and medium, -term. Though most growth theories ignore the role of Aggregate Demand, some economists argue recessions can cause hysteresis effects and lower long-term growth.

Limits to growth-An environmental perspective leads some to argue that in the very long-term economic growth will be constrained by resource degradation and global warming.

3.2 CLASSICAL GROWTH THEORY

Analysis of the process of economic growth was the primary feature of the work of classical economists viz. Adam Smith, Thomas Malthus and David Ricardo. They may be regarded as the main precursors of the modern growth theory.

Specifically, they were confronted with the facts of social and economic changes taking place in the contemporary English society living on the 18th and 19th Centuries on the eve of or in the throes of the Industrial Revolution.

Thus, their research was against the background of the emergence of the new economic system-the system of the Industrial Capitalism.

“Progress” was an essential component for the development of a society as it was seen as growth of national wealth. Hence, the principal of national advantage was regarded as an essential criterion of economic policy. Progress was also conceived within a framework of a need to preserve private property and hence, the interests of the property-owning class from this perspective, they endeavoured to show that the exercise of individual initiative under freely competitive conditions to promote individual ends would produce results beneficial to the society as a whole. Conflicting economic interests of different groups could be reconciled by the operation of competitive market forces and by the limited activity or role of Government.

They were able to provide an account of the broad force that influences economic growth and the mechanisms underlying the growth process. They recognised that the accumulation and productive Investment of a part of the social product is the main driving force behind economic growth and that under capitalism this takes place in the form of reinvestment of profits. Their critique of feudal society was based on the observation that a large part of social product was not invested but consumed unproductively. The explanation of the forces underlying the accumulation process was seen as the heart of the problem of economic growth. Associated with accumulation is technological change as expressed in the dimension of labour and change in methods of production. To these basic forces in economic growth they added the increase in supply of labour through growth of population. Their analysis on the operation of these forces led them to the common view that the process of economic growth under the conditions they identified raises obstacles in its own path and is ultimately retarded, leading to a ” stationery state”, which is the ultimate end of economic growth.

Adam Smith posited a supply-side driven model of growth. Population growth, Smith proposed in the traditional manner of the time, was endogenous: it depends on the sustenance available to accommodate the increasing workforce. Investment was also endogenous: determined by the rate of savings (mostly by capitalists); land growth was dependent on conquest of new lands (e.g. colonization) or technological improvements of fertility of old lands. Technological progress could also increase growth overall: Smith's famous thesis that the division of labor (specialization) improves growth was a fundamental argument. Smith also saw improvements in machinery and international trade as engines of growth as they facilitated further specialization. Smith also believed that "division of labor is limited by the extent of the market" - thus positing an economies of scale argument. As division of labor increases output (increases "the extent of the market") it then induces the possibility of further division and labor and thus further growth. Thus, Smith argued, growth was self-reinforcing as it exhibited increasing returns to scale. Finally, because savings of capitalists is what creates investment and hence growth, he saw income distribution as being one of the most important determinants of how fast (or slow) a nation would grow. However, savings is in part determined by the profits of stock: as the capital stock of a country increases, Smith posited, profit declines - not because of decreasing marginal productivity, but rather because the competition of capitalists for workers will bid wages up. So lowering the living standards of workers was another way to maintain or improve growth (although the counter-effect would be to reduce labor supply growth). Despite increasing returns, Smith did not see growth as eternally rising: he posited a ceiling (and floor) in the form of the "stationary state" where population growth and capital accumulation were zero.

Smith's model of growth remained the predominant model of Classical Growth. David Ricardo (1817) modified it by including diminishing returns to land. Output growth requires growth of factor inputs, but, unlike labor, land is "variable in quality and fixed in supply". This means that as growth proceeds, more land must be taken into cultivation, but land cannot be "created". This has two effects for growth: firstly, increasing landowner's rents over time (due to the limited supply of land) cut into the profits of capitalists from above; secondly, wage goods (from agriculture) will be rising in price over time and this then cuts into profits from below as workers require higher wages. This, then, introduces a quicker limit to growth than Smith allowed, but Ricardo also claimed (at first) that this decline can be happily checked by technological improvements in machinery (albeit, also with diminishing productivity) and the specialization brought by trade, although he also had stationary states.

Malthusianism is the idea that population growth is potentially exponential while the growth of the food supply or other resources is linear, which eventually reduces living standards to subsistence levels.. Thomas Robert Malthus, in his 1798 writings, *An Essay on the Principle of Population* believed there were two types of "checks" that are continuously at work, limiting population growth based on food supply at any given time:

- *preventive checks*, such as moral restraints or legislative action — for example the choice by a private citizen to engage in abstinence and delay marriage until their finances become balanced, or restriction of legal marriage or parenting rights for persons deemed "deficient" or "unfit" by the government.
- *positive checks*, such as disease, starvation, and war, which lead to high rates of premature death — resulting in what is termed a Malthusian catastrophe. Such a catastrophe inevitably has the effect of forcing the population (quite rapidly, due to the potential severity and unpredictable results of the mitigating factors involved, as compared to the relatively slow time scales and well-understood processes governing unchecked growth or growth affected by preventive checks) to "correct" back to a lower, more easily sustainable level.

3.3 MARXIAN THEORY OF GROWTH

The *Karl Marxian model of economic growth* is available in his famous book *"Das-Capital"*. He rejects the salient features of classical model of economic growth. He rejected the law of diminishing returns and says that the final outcome of stationary state in classical model is not a natural process, it is due to human arrangements. He also rejects Malthusian theory of population.

Marx's theory seeks to combine economics and sociology and views economic development as a continuous change in the social, cultural and political life of society. In this theory, economic systems reach higher stages through strained relations between the dynamic forces of production and slowly evolving social and political organisation which permits production. The stages of development: a) primitive-communal society b) feudalism c) capitalism d) socialism e) communism.

He predicted that capitalism is characterised by a class struggle. Growing conflicts between labour and capitalists would eventually lead to a revolution in which capitalism based on private ownership would be transformed into socialism based on public ownership.

This theory gives an important insight to the problems faced by most developing economies that have been relying on investment in the modern Industrial sector to achieve development- basically the increases in employment have been much slower due to labour-saving technologies (also in contrast to output growth as a result of Investment).However, increase in labour force has been more due to growing population and thus, what can be observed is growing inequality and social instability.

Followers of Marx have highlighted how the International capitalist system has aggravated the gap between rich and poor countries and that there is a need to restructure the world capitalist system to help least developed countries become less dependent and vulnerable given the subservient position this system has put them in.

Check Your Progress 1

1. Discuss the Classical Theory of Economic growth.

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Q2. How do you explain the Marxian criticism of the Classical Theory of growth?

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3.4 STAGES OF GROWTH THEORIES: ROSTOW AND KUZNETS

3.4.1 Rostow's Theory

Walt W. Rostow has explained the transition from underdevelopment to development in terms of a series of steps or stages through which all countries must proceed. His work"The Stages of Economic Growth" explains in detail the growth process via these stages:

a)The traditional society b)The preconditions for take-off c)The take-off d)The drive to maturity e)High mass consumption.

Thus, as an economy takes on the path of growth there are economic, social and institutional changes that kick-start growth rather slowly and then the economy grows rapidly before it saturates to a high income level.

3.4.2 Kuznet's Theory

Simon Kuznets gave the concept of Modern Economic Growth and defined the economic growth of a country as "a long-term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands." He defined six basic characteristics of Modern Economic Growth:

1.High rates of growth of per capita output and population

2.High rates of increase in Total Factor Productivity

3.High rates of structural transformation of the economy

4.High rates of social and ideological transformation

5.The propensity of economically developed countries to reach out to the rest of the word for markets and raw materials

6.The limited spread of economic growth to only one-third of the world's population

Kuznets observed these for a large number of developed countries.. He said that the six characteristics are mutually reinforcing and inter-related.

He developed an approach to the analysis of economic growth over long historical periods he called as an "economic epoch". The innovation/scientific knowledge and its application define an epoch and thus, economic growth and structural change.

3.5 STRUCTURAL CHANGE MODELS

3.5.1 Lewis Model and Patterns of development analysis

Structural change models are based on the popular notion of "Dualism", which in Development Economics is a relevant concept to understand the dynamics of growing economies. Dualism in Economics is the coexistence of two contrary forces in an economic set up. It can be of various types viz, organisational, technological or structural dualism on the basis of classification of an economy. W Arthur Lewis in the 1950's is one of the most famous structural change models which focuses on the changes in a growing economy where a traditional agricultural or rural sector paves way for the modern industrial urban sector which then is responsible for growth via capital accumulation. His model was based on the unlimited supply of labour in underdeveloped economies mostly in the traditional agriculture sector and how this surplus labour can be used in the modern industrial sector that grows and provides employment and higher wages to labour. Also this sector then kick starts economic growth as it accumulates capital and as Investment happens.The process of modern sector self-sustaining growth is assumed to continue till all surplus labour is absorbed in the industrial sector. The balance of the economy lies in the equilibrium of both agriculture and industrial economic activities.

The patterns-of-development analysis of structural change focuses on the sequential process through which the economic, industrial and institutional structure of an underdeveloped economy is transformed to accommodate new industries as an engine of growth. Increased savings and Investment here are taken to be necessary but not sufficient conditions for growth. In addition to accumulation of capital both physical and human, there is a need for a set of interrelated changes in the economic structure of the economy for the transition.These changes occur both at domestic and International level. Thus, growing economies can benefit(or lose) by being part of the integrated International system is what this analysis recognises unlike other models that look at structural change as a domestic process only.

3.5.2 The International Dependence Model and the Dualistic-Development Thesis

The International Dependence Revolution models view developing countries as engulfed in domestic and International rigidities and thus, caught up in a dependence and dominance relationship with developed countries. The dependence model divides the world into a "centre" and a "periphery" where there is an unequal set up of power dynamics. The developed countries are the dominant Centre whereas the developing countries are the dependent periphery governed by the dominance and vulnerability of the Centre, thus paving way for impoverishment of the periphery.

The Dualistic-development Thesis envisages the concept of Dualism such that rich and poor countries and rich and poor people have inherent differences at various levels and thus there is the existence and persistence of divergence between these. The economic systems are characterised by different sets of conditions which are elements of dualism and this coexistence is chronic in nature. Also this dualism is responsible for gaps between rich and poor that don't decrease but rather increases with time. Hence, the increasing gaps between rich and poor.

3.6 THE NEOCLASSICAL COUNTER REVOLUTION AND TRADITIONAL NEOCLASSICAL GROWTH THEORY

The 1980's saw the emergence of the Neoclassical Revolution in the developed countries where they favoured the supply-side macroeconomic policies, rational expectations theories and privatization of public corporations. You have read about these in your courses in microeconomics and macroeconomics.

Free-market analysis argues that markets alone are efficient and thus, any kind of Government intervention is distortionary and counterproductive.

Public-choice theory (new political economy approach) goes further to argue that Government does nothing right. This is because this approach assumes that politicians, bureaucrats, people and states all pursue their selfish interests and hence, the overall result is misallocation of resources. Thus, minimum Government intervention is best.

The Market-friendly approach accepts the notion of Market-failure and unlike the Free-Market approach and Public-Choice Theory, recognises the role of Government intervention to correct these failures. This approach however focuses on market-friendly interventions. All these theories are applied to all areas of economic life, including economic growth. Hence, these are, strictly speaking, not theories exclusively of economic growth, but rather approaches to economic policies and the role of government in the economy.

The Neoclassical Growth Theory is an economic model of growth that outlines how a steady economic growth rate results when three economic forces come into play: labor, capital, and technology. Solow Model of growth is the most popular neoclassical model of growth. It extended the

Harrod-Domar model of growth, which laid the foundation of growth(given constant returns)on the process of capital accumulation. The mobilisation of savings into Investment would help a country achieve growth via accumulation of capital in this model. Solow Model added to this by introducing the role of labour in the given framework and extended it further to technological advancements. Diminishing returns to individual factors of production is Solow's twist to the Harrod Domar Model. The model predicts the convergence of long run growth across countries via the Stady state.

3.7 THE THEORY OF ENDOGENOUS GROWTH

As the predictions of the neoclassical models didn't work exactly the way they were expected to and many developing countries could not grow rapidly despite surge in investment and liberalization, the growth theory moved to New Growth models that relied on explaining growth with factors that played their role from *within* the system and hence the term Endogenous growth models. These models relied on examining growth beyond the exogenous factors as used in neoclassical models.

Endogenous growth theory holds that investment in human capital, innovation, and knowledge are significant contributors to economic growth. The theory also focuses on positive externalities and spillover effects of a knowledge-based economy which will lead to economic development.

Paul Romer has made a significant contribution to Endogenous Growth theory. In choosing Romer as one of the 2018 economics laureates, the Royal Swedish Academy of Sciences stated that he had shown how knowledge can function as a driver of long-term economic growth and earlier studies had not modelled how economic decisions and market conditions determine the creation of new technologies. Paul Romer solved this problem by demonstrating how economic forces govern the willingness of firms to produce new ideas and innovations.

Robert Lucas along with Paul Romer heralded the birth of endogenous growth theory and the resurgence of research on economic growth in the late 1980s and the 1990s.

Key Policy Implications of Endogenous Growth Theory

- Government policies can raise an economy's growth rate if the policies are directed towards enforcing more market competition and helping stimulate innovation in products and processes.
- There are increasing returns to scale from capital investment in the "knowledge industries" of education, health, and telecommunications.

- Private sector investment in Research and Development is a vital source of technological progress for the economy.

You will study more about endogenous growth theory in unit 6.

3.8 UNIFIED GROWTH THEORY

Oded Galor founded the theory of unified growth, or unified growth theory that explores the process of development over the entire course of human history and identifies the historical and prehistoric forces behind the differential transition timing from stagnation to growth. It also explores the divergence in income per capita across countries and regions

He has made significant contributions to the understanding of the process of development over the entire course of human history and the role of deep-rooted factors in the transition from stagnation to growth and in the emergence of the vast inequality across the globe. He has pioneered the exploration of the impact of human evolution, population diversity, and inequality on the process of development over most of human existence.

Check Your Progress 2

1. How do you explain the Neoclassical counterrevolution in explaining growth?..

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2. Examine the neoclassical growth theories and the emergence of Endogenous growth in the light of these.

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3.9 LET US SUM UP

This unit sets the ball rolling about theories of growth. The unit gave an overview on approaches to growth, some of which you will study in detail in the next few units, and some others in the next course on development economics that you will meet in the next semester. The unit familiarised you about the concept of growth and what a theory of economic growth means. You learnt the evolution of theories of growth from the time of classical economists like Adam Smith.

The unit began with an exposition of classical theories of growth Special emphasis was laid on Adam Smith's theory. Then the unit briefly explained the theories of Malthus and David Ricardo. The theory of economic growth as expounded by Marx was discussed. We saw that Marx had talked about certain stages through which society passes. The unit also discussed the stages of growth theories of Rostow and Kuznets. The unit then discussed economic theories which were about structural change. The unit mentioned the Lewis growth model and other dualistic theories as also international dependence theories.

Subsequently, the unit went on to touch upon free-market espousing neoclassical theories as well as traditional neoclassical theory. You will study about neoclassical growth theory put forward by Robert Solow in unit 5. Finally, the unit dwelled upon endogenous growth theory, and unified growth theory put forward by Oded Galor.

3.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. See section 3.2
2. See section 3.3

Check Your Progress 2

1 See section 3.6

2 See section 3.7