Chapter III

ECONOMICS OF DISEQUILIBRIUM
In this chapter we are mainly concerned with the Economics of Disequilibrium. Recently, many economists have switched over to the theory of disequilibrium as against the erstwhile equilibrium analysis. Disequilibrium is the state of a system in which equilibrium has not been attained. The opposing forces which act on the system are not in balance, so there is a tendency for at least some of its endogenous variables to change over time. Disequilibrium is usually associated with the mutual inconsistency of the plans of economic decision-takers so that at least some of these plans are not realized and are eventually revised. For example, a market will be in disequilibrium if the total quantity which buyers plan to buy at the ruling prices exceeds the quantity which sellers plan to sell. In the event some buyers will not be able to realise their plans, prices will be bid up, and all sellers and buyers will revise their plans accordingly. A question of great interest for all economic systems is whether characteristics of the system are such that process of plan revision will lead towards or away from an equilibrium, and this is the subject matter of stability analysis. Where the disequilibrium adjustment process leads towards an equilibrium, the system is called stable, while the term unstable is applied to the converse case. The nature of disequilibrium phenomena can be understood by quoting Janos Kornai "the disproportional dominating the investment market is the kernel, the starting point of a broad group of phenomena: the general disequilibrium between demand and supply".¹ Shortage phenomenon in German literature is called 'Mangelwirtschaft' which means shortage economy or disequilibrium. Traditional price theory and equilibrium theory simply call it excess demand others use the expression 'sellers market' emphasising that in this case of disequilibrium the seller dominates the market and the buyer is at his mercy.
In this chapter we will include the contribution of five distinguished economists, namely Robert Wayne Clower, Axel Leijonhufvud, George Shackle, Janos Kornai and Georgescu-Roegen.

Clower managed to account for Keynes' "unemployment equilibrium" by introducing a new concept of "dual hypothesis". He also introduced a new concept, namely 'notional demand' and reintroduced 'effective demand'. The concept of effective demand was popularised by Keynes. Leijonhufvud does not accept the idea that Keynesian economics is an 'equilibrium economics'. He argued that the whole Keynesian economics should belong to disequilibrium economics. Shackle's contribution is also included in the category of disequilibrium. Janos Kornai criticised Walras's 'General Equilibrium Theory', Georgescu-Roegen introduced a new concept of 'Bio-economics'. In the following pages we will discuss each of the above concepts in detail.

ROBERT WAYNE CLOWER

Life Sketch

Born in Pullman, Washington (USA) in 1926, Robert Wayne Clower took his Bachelors degree in 1948 and his Master's degree in 1949 from Washington State University. He obtained his Doctorate from the University of Oxford in 1978. He taught at the Universities of North-Western, California and Los Angeles. He too taught at the various reputed Universities of the World -
Australia, Canada and Italy.

**His Works**


**His Contribution**

**Orthodox View**

Recently, one of the most important papers published in Microeconomics is Robert Wayne Clower's essay - *The Keynesian Counter Revolution*. There is unemployment in Labour markets, but he is successful to provide the first convincing Microeconomics explanation of how equilibrium is achieved in Keynesian model. It is a well-known fact that orthodox economics provided a general theory of equilibrium state - that is, an adequate account of the factors determining equilibrium prices and equilibrium transaction plan in a market economy. Moreover, the same analysis may be said to provide the beginning of a theory of disequilibrium prices and disequilibrium transaction plan. Clearly, however, orthodox analysis does not provide a general theory of disequilibrium state. First, because it yields no direct information about the magnitude of realized transactions as distinct from planned transactions under disequilibrium conditions. Second, it tacitly assumes that the forces tending at any instant to change prevailing market prices are independent of realised transactions
at the same moment. Before detailed discussion of the area, let us first define the two terms 'equilibrium' and 'disequilibrium' in Robert Clower's own language.

**Equilibrium and Disequilibrium**

The word 'equilibrium' in its usual sense means an 'absence of motion'. A market is in equilibrium if and only if market price and quantity traded are stationary over time. The economy may be said to be in a state of disequilibrium if prevailing prices are such that demand differs from supply in any market. This means that individual trading plans, taken as a whole, are mutually inconsistent which in turn, means that at least some individual plans cannot be carried into effect at prevailing market prices. In these circumstances, it is plausible to suppose that prevailing prices tend to vary over time - rising in market where demand exceeds supply, falling in market where supply exceeds demand.

**Notional and Effective Demand**

Robert Clower introduced two types of demand namely 'Notional Demand' and 'Effective Demand'. The former is the demand of households at full employment equilibrium prices. Some households will reduce their consumption expenditure if the economic system does not reach full employment equilibrium. It is due to the fact that their actual incomes have fallen below the notional incomes. The latter functions are those which take into account the constraints.

When there is considerable unemployment, the excess supply of labour
at the going real wage rate is not matched by an equivalent excess effective demand for goods and services because some 'notional' excess demand has been eliminated by the reallocation of expenditure reflecting the constraint of reduced incomes. Those deviations from full employment equilibrium are spread throughout all markets via the multiplier process. Producers now will receive the wrong price signals, which will not necessarily induce the adjustment that leads to full employment equilibrium. The labour market would be cleared if money wages were reduced but such wage reductions are not communicated to employers as an increase in effective demand for output. In consequence, labour markets are cleared by adjusting employment to unchanged wages instead of wages being adjusted to unchanged employment level.\(^4\)

In a nutshell, economic adjustments depend more on income instead of relative prices. It is due to the fact that all exchange is regarded as disequilibrium exchange at 'false prices'. According to pre-Keynesian concept there is automatic adjustment of prices to clear markets. If we eliminate this automatic mechanism from price behaviour there will be either shortages or surpluses in all markets and less than full employment.

It can be concluded that Clower gives a new terminology to Keynes' 'Unemployment Equilibrium' by introducing the concept of the 'dual-decision hypothesis'. But many economists do not accept Clower's view. Whatever the reality may be on this question, we find a lot of changes in the field of macroeconomics since the publication of his essay. But some of the contem-
porary economists like Leijonhufvud and Okun have adopted the notion of 'dual
decision hypothesis' as the micro-foundations of a Keynesian type of macro­
economics. Clower's contribution is largely theoretical in nature.

**AXEL LEIJONHUFVUD**

**Life Sketch**

Axel Leijonhufvud was born in Stockholm (Sweden) in 1933. He earned
his first Doctorate degree in 1960 from the University of Lund and he received
his second Ph.D. degree from North-Eastern University in 1967. He became
Professor of Economics in 1971 at the University of Los Angeles.

**His Works**

Leijonhufvud best known books are : On Keynesian Economics and the
Economics of Keynes (1968) and Information and Coordination: Essays in

**His Contribution**

Leijonhufvud claimed that Keynes' economics is a 'disequilibrium'
economics. Keynes assumed a world which is less than perfect information.
Further, Keynes did not assume that money wages are inflexible but rather
that all prices including wages change only slowly. The basic cause of unemploy­
ment in Keynes' opinion is that 'relative prices' are wrong. To generate full
employment, long term bond prices are too low and interest rates are too high.

**Keynes' Theory of Interest**

Keynes' theory of interest is a theory of short-run interest movement. The theoretical problems with which he was concerned were problems of the short-run, i.e. disequilibrium. Keynes' model was static but his theory was dynamic. The tools of equilibrium analysis must be handled with much circumspection when what is being analysed is not an equilibrium state but an equilibrium process, i.e. a succession of disequilibrium states.\(^5\)

According to Axel Leijonhufvud, Keynes dealt with a 'Comparative Statics' period analysis. His employment of a static apparatus has frequently been criticised, but the critique has often suffered from a confusion of the method and substance of the General Theory. The subject of his work is not "Unemployment Equilibrium" but the nature of the macroeconomic process of adjustment to a disequilibrating disturbance. The method attempts to analyse this continuous process with the tools of static equilibrium theory. The device which makes such a method possible involves the conceptual partitioning of the continuous adjustment process into discrete stages or periods. This device was not Keynes' invention. Marshall had made much use of it, and in this aspect of his method, as in many aspects, Keynes was very Marshallian. But Keynes differed substantively from Marshall as well as from other price theorists in the use he made of his device.
Prices

Leijonhufvud argued that in general equilibrium flow models, prices are only endogenous variables. It is these variables which enter into the demand and supply functions of individual households. Tastes and initial resource endowments are parametric. Similarly, if prices are not "perfectly flexible" - that is, if they do not adjust instantly and fully before any trade takes place - transactions will be concluded at disequilibrium prices. In Keynesian disequilibrium generally households are to some extent constrained by their inability to sell what they want at the prices of the moment. Firms like households are not always dependent solely on current revenues in order to finance current purchases. A firm's willingness and ability to utilise other sources of funds at a particular position. Since these are variables, the short-run reaction functions of producers will usually shift over time.

Information Costs

Further, the analysis of individual trader in a disequilibrium situation can be advanced by bringing in information costs explicitly. It is sometimes maintained that the competitive firm's information problem is simpler than that of the monopolist. The competitive seller needs to know only his cost function and the market price of his product in order to maximise profits. The monopolist, it is argued, needs information on his entire demand function. This argument can be examined with the help of disequilibrium situation. In disequilibrium, it is hard to see how it can be argued that sellers in 'atomistic markets'
have simpler information problems than the monopolist. Since the monopolist makes the market, the actual outcomes of all trading constitute information automatically available to him. He does not need to find out what a multitude of other sellers are doing, if there are multiple prices in the market at any time, it is because he, the monopolist, is discriminating; he does not have to devote resources to finding out where and by whom what price is paid. When the atomistic market is in disequilibrium, the individual seller can no longer regard price as "parametric" he must attempt to form an estimate of how 'industry demand' is developing in order to formulate a rational pricing policy. Changes in his own rate of sales give the atomistic seller less accurate indications of the relevant 'demand changes' than in the monopolist's case, since multiple price will be changed in the market at any one time. The information which he would need for an optimal pricing policy includes a lot of data, freely available to the monopolist but which he can only acquire at formidable cost.

In the end, it may be said that Leijonhufvud's contribution can be easily included in the new branch of economics - economics of disequilibrium. As a contribution to disequilibrium economics, Leijonhufvud's contribution was great and disequilibrium analysis has ever since become a part and parcel of modern economic theories.
GEORGE SHACKLE

Life Sketch

Born in Cambridge in 1903 and educated at the University of London, George Shackle became Professor of Economics in 1951 at the University of Liverpool, where he remained until his retirement in 1969.

His Works

Shackle's best known publications are: Expectations, Investment and Income (1938); Expectation in Economics (1949); Decision, Order and Time in Human Affairs (1961); The Years of High Theory: Invention and Tradition in Economic Thought, 1926-1939 (1967); and Epistemics and Economics: A Critique of Economic Doctrines (1972).

His Contribution

George Shackle's reputation mainly rests on his writing about 'Uncertainty' 'Expectation', 'Unpredictable Future'. His entire career has been devoted in preaching the doctrine that economic activity is ruled by expectations of future events. He argued that "The General Theory" is highly paradoxical. The book in fact uses a partial equilibrium method for a whole system of equilibrium purpose. There is partial equilibrium since something is held constant for the sake of argument which cannot be constant in life. But we would deal only with his two theories of 1) Surprise Function and 2) Investment, Rate of Interest
and Invention for which we have sufficient materials.

**Surprise Function**

Shackle offered a 'theory of surprise function' as a way out of the dilemma of foresight in the presence of uncertainty. Economic agents do have definite expectations about future events, at least, in the negative sense of being 'surprised' by certain improbable outcomes including the surprise of a totally unexpected event. The surprise function is a special sort of non-probabilistic function of the expected values of future outcomes. Shackle was able to formulate some general propositions about the shape of these surprise functions. However, Shackle's theory of surprise functions was not well received by the rest of the economics profession. Keynes had argued that investment is a volatile and unpredictable variable, precisely because of the unstable expectations of private investors, and this much was generally accepted by macro-economists.6

**Investment, Rate of Interest and Inventions**

Shackle, in his book *Expectations, Investment and Income* discussed in detail investment, rate of interest and inventions. Investment is a flow. It is of dimension \( \frac{\text{money value}}{\text{Time}} \). The time rate of aggregate investment depends on businessmen's expectations and on the rate of interest. Investment thus defined is the aggregate value of the additions made in a short interval of the immediate past to the separately owned sub-systems making up the economy's general complex of equipment. Each of these additions is what is left after
subtracting, from the whole value of items which have newly come into possession of an enterprise by production or purchase during the short interval which has just elapsed, the value of those destroyed by acts of production or parted with by sale during this interval, both these valuations being made by the owner of the enterprise in the light of any new knowledge which may have come to him during the interval.7

It can now be concluded that Shackle has criticised the contribution of other economists on the ground that they have neglected the problem of uncertainty in their writings. His idea is perhaps correct as anything can happen tomorrow in any economy. Recently, in many economic systems of the world particularly communist blocks consisting of East Germany, Romania, U.S.S.R. and even China, the people are prepared for a change into democratic freedom with multi-party system of government. But it is difficult to accept his argument that the whole of economic literature which does not include the component of 'uncertainty' is invalid in modern world. However, his elements of 'uncertainty' and 'expectation' can be included as an additional variable for understanding and solving modern economic theory.

JANOS KORNAI

Life Sketch

Born in 1928 in Budapest, Hungary, Janos Kornai entered the Hungarian Academy of Science and received his first degree in Science in 1956. He
switched over to Economics, took his Doctorate degree from Karl Marx University in 1961. In the year 1966, he acquired another Doctorate degree in Science from the Hungarian Academy of Science.

His Works

Kornai's publications include: Over-Centralization of Economics (1959); Mathematical Planning of Structural Decisions (1967); Anti-Equilibrium (1975); The Economics of Shortage (1980) and Growth, Shortage and Efficiency (1982).

His Contribution

General Equilibrium Theory

According to Kornai, up to the present, Economics has produced only a single theory describing the operation of the economy from a system of theoretical point of view. This conceptual framework, typically expounded in formal mathematical models, is called 'General Equilibrium theory' and derived from the teaching of Walras. In order to avoid misunderstanding among readers, Kornai always refers to the Walras School. He does not refer to the theories dealing with problems of budgetary equilibrium or balance of payments equilibrium.

The 'General Equilibrium' theory claims to offer an explanation of reality. But it does not insist on verification. The theory is unrealistic because in order to regard a 'theory', it should possess a dual definition: 1) In the logical mathematical sciences, a theory is a theorem or body of theorems logically
deducible from a set of mutually consistent axiom; 2) In the real sciences, a theory is a systematic description of the essential interrelations between the variables of reality. That is, only those theorems and propositions (deduced from the assumptions not in conflict with reality) which describes the real world more or less accurately may be considered acceptable. 

Walras's Assumptions

Walras's Theory of General Equilibrium is based on twelve assumptions:
1) It assumes a number of elements in the model to be constant; 2) The economic system consists of a definite number of organisations, their number and set remain unchanged over time; 3) It is based on two types of organisations - producers and consumers; 4) It rests on a finite number of products - their number and set is unchanged over time; 5) The economy operates without either material or monetary inventories and reserves; 6) The set of feasible production is convex. The producer maximizes the difference between total revenue and total expenditure, i.e. his profit; 8) Maximization of consumer utility; 9) The Constancy of production and consumption sets and of preference ordering; 10) Exclusively of price information flows; 11) Anonymity of market relations and 12) Lack of uncertainty.

Kornai assumes that General Equilibrium School has become a brake on the development of economic thought. However, this school has suggested two important and realistic ideas: i) scarce resources should be used economically; ii) production should be adopted to provide greatest satisfaction to
the consumer. As a matter of fact, there is a train of thoughts that these conclusions are derived from the unrealistic vision of the world. In reality, there are mammoth corporations and the role of the government is great. General Equilibrium theory assumed atomized markets and perfect competition. These exists sharp conflicts of interest. But the theory sees peaceful harmony in the market. The latter disregards increasing returns to scale, one of the most significant aspect of technical progress as well as concentration. In addition the information structure is highly intricate and complex. But General Equilibrium describes that the whole system is governed by only one mechanism, i.e. by prices.

The General Equilibrium School is diverting our attention regarding the most important task of economic science, namely, the realistic description, explanation and formal modelling of the actual operation of the socialist and capitalist economic systems of the present era.

Price Information


Let us explain the concepts of each of them in brief:

1) **Actual Price**: this is the price at which the actual transaction between
buyer and seller, as well as the accompanying money flow takes place.

2) **Contract Price**: Proceeding backwards in time, this price precedes the actual price. Sometimes the actual price deviates from the contracted one.

3) **Price Offer**: This proceeds the contracted price. Offers can be made both by the seller to the buyer and vice-versa and these may undergo several modifications in the course of preparing the contract.

4) **Price Prognosis**: This may be prepared either by the buyer or seller or by another organisation. Even if it is prepared by the party concerned, the prognosis may differ from the subsequent offer.

5) **Prescribed Price**: This is an instrument issue (generally in socialist systems) by the government price authority or (the capitalist system) by a multi-firm cartel to the contracting parties.

6) **Price Report**: This can be submitted to many kinds of addresses, the price authority, statistical officer, tax-office, economic research institute etc. This too may differ from the actual price, either through inadvertent inaccuracy or through deliberate distortion.

Control Sub-Systems of Information

Kornai explains five control sub-systems of information, viz.:

1) **The market**: the sub-system directly regulating sales, purchases and transactions involving products;
2) The monetary and credit sub-system;

3) The sub-system of national economic planning;

4) The sub-system of information about technical progress and science,

and

5) The sub-system of labour allocation.

Out of the five sub-systems of information, only one type of information is present in the General Equilibrium model, i.e. market. The rest are neglected. As a result of this negligence, General Equilibrium Theory is unacceptable in the real world.

Modern mathematical equilibrium theory never advanced beyond the phenomena of the mid-nineteenth century. The world of Walras is a strictly single level economic system. The second basic assumption of the General Equilibrium School states that the economic system consists exclusively of real organisations; producers and consumers. This assumption hinders any further study of the multi-level phenomenon. It is only in recent years that mathematical models have appeared which represent multi-level economic system even if only partially and mainly in connection with planning. Originally these models owed their existence to technical computing, considerations; in order to facilitate the solution of large-scale linear programming problems, so called 'decomposition methods' were worked out. The widely employed decomposition method was developed by Dantzig and Wolfe.

It will be useful to determine whether or not the multi-level planning
models can be further developed into models describing multi-level control of economic systems, involving uncertainty as well as the formalisation of the multiplication of information. This is one of the important problems of research on the economic system theory in the future.

Arthur Okun argues that so far as underdeveloped economics are concerned, growth occurring in a state of disequilibrium is more advantageous as compared to equilibrium growth. Further, Hirschman, Streeten, and Manson believed that continuous 'suction' (shortage) and the appearance of bottlenecks may give an impetus to the country's economic development.

To conclude, we cannot completely reject the General Equilibrium theory as it was stated by Kornai. We do not have sufficient answer about the empirical validity of the theory. While some studies have refuted the theory, others have supported the theory. Let us assume that a day will come when a supercharged economist with supersonic calculating equipment (computer) backed by saturated foundation will perform this onerous task. However, modernisation of the General Equilibrium theory has already taken place and is associated with the names of Arrow, Debreu, Gale, Koopmans, Mackenzie, Uzawa, Wald and others.

NICHOLAS GEORGESCU-ROEGEN

Life Sketch

Nicholas Georgescu-Roegen was born in Romani in 1906. In 1930 he
took his Doctorate degree in Statistics from the University of Paris. For one year, he studied with Karl Pearson in London. He started teaching at the University of Bucharest and became a Professor in the Department of Statistics in the year 1932. His ideas had a strong impact on American economists when he was a Visiting Fellow at Harvard in 1930's. He became a Professor in 1949 at Vanderbilt University. He remained there till his retirement in 1976.

His Works


His Contribution

Bioeconomics

Georgescu-Roegen introduced a new concept of Bioeconomics. In the words of Professor Mark Blaug, "Bioeconomics is the notion that production, involving as it does the transformation of what is for all practical purposes a constant stock of matters and energy, must conform to the same 'Law of Entropy' that governs all closed systems; entropy or unavailable matter and energy tends constantly to increase, while available matter and energy tends constantly to decrease." Georgescu-Roegen concept of Bioeconomics is a new style of dialectical economic thinking. With mechanical mode of reasoning, it replaces more or less the whole of present day economics. The author argues
that the economic process is not a mechanical equations, and cannot be reduced to mechanical equations. It cannot be understood without the concepts of purposive activity and enjoyment of life. The study of this process cannot be built on what he calls "arithmomorphic" concepts, i.e. discretely distinct propositions holding true in all times and places. Instead it depends on "dialectical concepts" not in the Hegelian sense but in the sense of being surrounded by pnumbras and overlapping with their opposites. But he insists that correct reasoning with dialectical concepts is not impossible. Indeed no science can completely avoid them. Arithmomorphic models are absolutely essential in any science including Economics. They seldom represent accurate blue-prints. Instead, they are analytical similies by which we can test or illustrate our dialectical reasoning. As Georgescu-Roegen puts it "there is a limit to what we can do with numbers as there is a limit to what we can do without them."

Theoretical Science

He maintains the argument that Economics is not a "theoretical science" if by theoretical science, we mean "logically ordered description". He maintains that a social scientist seeking counsel and inspiration for his own activity from the modern philosophy of science is apt to be greatly disappointed, perhaps also confused. Most of this philosophy has come to be essentially a praise of theoretical science and nothing more. Since of all sciences professed today only some chapters of physics fit the concept of theoretical science, it is natural that almost every modern treatise of critical philosophy should avoid any refe-
rence to fields other than theoretical physics.

Entropy Law

Economists' vision has reacted to the discovery of the first law of the thermodynamics, i.e. the principle of conservation of matter and energy. Marshall in his Principles of Economics states that man can neither create matter nor energy. In physics as well as philosophy of science, we find Entropy Law. But economists have failed to pay attention to this law, the most economic of all physical law. "Entropy" means latent energy/absolute temperature. The literature on economic development proves doubtlessly that most economists profess a belief tantamount to thinking that even entropy, bottlogging is unnecessary; the economic process can go on, even grow, without being continuously fed 'low entropy'. Economic process is not circular but undirectional. As far as this facet is concerned, the economic process consists of a continuous transformation of low entropy into high entropy, the irrevocable waste.

Georgescu-Roegen elucidates that mathematical economists like Walras and Jevons have introduced mathematical models in order to explain consumer's behaviour but they were criticised by economists concerning the legitimacy of forcing human nature into the rigid frame of a mathematical structure. Owing to further improvement of the theory of choice, the controversy over the justification of consumers behaviour, at least for the purpose of static theory, slowly faded away. In the meantime, modern mathematical economists carried the theory of choice to such a level that apparently very little could still be added
to refine it further. The theory of consumer choice is even applicable to choice in general. Thus it could provide an adequate background for a theory of entrepreneurial decisions under multiple criteria some of which, nothing as a purley economic implication, ought to be classified as social factors.

**Law of Demand**

The law of demand is the relationship between prices and quantities is an economic law. An increase in price will bring about a decrease in the quantity. But according Georgescu-Roegen, this statement is not a quantitative law in the usual sense of the word. It does not imply a reversible relationship between prices and quantities. But it is simply a common feature of all demand laws either reversible or irreversible. From this to the representation of the demand law by a curve relating prices and quantities is a very long way. Yet, the step is commonly taken in connection with all similar truths in which economic theory abounds.

**Cardinal Argument**

He explains that the carinalist argument rests upon two unwarranted assumptions: In the first place the oversimplified patter of human behaviour ignores the irreducibility of wants. It is this assumption which leaked also into the ordinalist argument and which made it possible to use the real number system for ordering all non-equivalent alternatives. In the second place, credibility is ignored with the consequence that the background for unpredictable results is reduced to probability. This implies that man has almost 'demiurgie' know-
These are sufficient reasons to explain that though the cardinalist doctrine is analytically true but it cannot be believed in actual practice.

**Factor of Production**

Georgescu-Roegen gives two different definitions of a factor of production which are different in comparison to the general definitions which are often formulated by theoretical economist. The first definition states that 'a factor of production' is limitational if an increase in its inputs is a necessary but not a sufficient condition for an increase in output. According to the second definition 'a factor of production is limitative if an increase in inputs is both necessary and sufficient condition for an increase in output'.

**Opportunity Cost**

Georgescu-Roegen also discussed the concept of 'opportunity cost'. Opportunity cost in economics can be defined as that cost in term of the value of the alternatives or other opportunities which have to be foregone in order to achieve a particular thing. But he explains that the opportunity cost curves usually found in economic literature are not established on the assumption of maximum utilization of labour. Indeed the opportunity cost curves can be constructed either by assuring that the entire labour must be used; also it can be used only up to the point where labour's marginal productivity is sufficient to provide the working class with the minimum economic standard.
they are impracticable in real world. His definition of a 'theory is in the first and last phase a logical file of our factual knowledge pertaining to a certain phenomena logical domain. According to his view point, an economic theory to be operative at all, i.e. to be capable of serving as a guide for policy, it must concern itself with a specific type of economy not with several types at the same time.

Professor Paul A. Samuelson described Nicholars Georgescu-Roegen as "a scholar's scholar, an economist's economist".

In conclusion we may say that his contribution to economics can be placed in a high order and it is related to other branches of knowledge like Biology and Physics. As a theoretician, his work is indispensible to understand and analyse the problem of modern economic literature as a whole.

In the preceding pages we have dealt with the contribution of five economists, namely, Robert Wayne Clower, Axel Leijonhufvud, George Shackle, Janos Kornai and Georgescu-Roegen in the context of Economics of Disequilibrium. Hence, it is because of them that Economics of Disequilibrium emerges as a vital topic in contemporary economic theory. They provide us with the rethinking and reinterpretation of economic theories of Walras, pre-Keynesian and post-Keynesian approaches and methodology.
Notes and References


