Chapter V

DEVELOPMENT OF RADICAL ECONOMICS
The main pioneers in the development of radical economics are Joan Robinson, Maurice Dobb, Paul Baran, Piero Sraffa, Paul Sweezy, Samuel Bowles, Michio Morishima, Albert O. Hirshman, Samir Amin and others. However, owing to lack of sufficient materials, we propose to discuss the contribution of only two radical economists namely Robinson and Morishima. But before we proceed to discuss the contribution of the above two economists, we feel it relevant to define the nomenclature 'Radical Economics'.

The term "radical" has acquired a new dimension in economic thought. The Dictionary meaning of the word radical is that 'affecting the foundation, essential or fundamental or forming the basis'. The International Encyclopaedia of Social Sciences has this to say:

"The term 'radicalism' always points to some analytical or revisionist function. It implies a concentration of the focus of relevance on a particular principle, at the expense of the traditional sanction regard for the complexities of context. The element thus abstracted becomes the salient on which inference and action are based. Radical tends to comprehensive; no matter where it starts, it tends to assimilate all aspects of life to the initial principle".  

Thus it is not surprising that the nomenclature "Radical economics" should have attained such a status as to form a new branch of economics dealing with a comprehensive doctrine not based on logical deduction. It is a unified and internally consistent projection of a completely new version of human life. It always sticks to reality. It rejects orthodox theories which
are absolutely inapplicable and suggests revision wherever necessary. In this context, it is thought important to discuss in this chapter the contribution of the two radical economists.

**JOAN ROBINSON**

Mrs. Robinson is included in the group of radical economists because initially she was Marshallian but later on she became a supporter of Keynesian economics. In addition, she studied Marxian economics in detail. Many English economists once regarded her as a Marxist. But she was neither pure Keynesian nor a Marxist. She argued that there are many similarities between Marx and Keynes but this argument was paid less attention by economists. In order to understand different economic systems of the world, it is necessary and essential to study both Marxian and non-Marxian economics. She supported the view that economics is a dynamic subject and revision and reinterpretation of economic theories are always essential to reach the reality.

**Life Sketch**

Joan Robinson was born in Surrey in 1903 and educated at St. Paul's Girls' School, London and Girton College, Cambridge. She joined the Cambridge faculty as an assistant Lecturer in Economics. She became a University Lecturer in 1937, Reader in 1949 and finally a Professor in 1965, and retired in 1971. At first Mrs. Robinson was influenced by the Marshallian thought but later on she switched over to Keynesianism. Her own contribution to
the study of imperfect competition helped shatter the Marshallian inheritance.

Her Works


Her Contribution

Robinson in her contribution discussed that Cournot was the first economist who showed a clear grasp of imperfect competition in his Researches into the Mathematical Principles of the Theory of Wealth (1838). Cournot took the example of the owner of a spring well who being a monopolist, would fix the price of water at a level which would give him the maximum revenue. Similarly, he took the example of duopoly, i.e. two proprietors of such springs competing with each other in the same market. But credit should be given to the Italian economist, Pierro Sraffa, for presenting a general outline of the theory of imperfect competition. He published an article under the caption
'The Laws of Return under Competitive Conditions' in the 'Economic Journal' of December, 1926. In that article, he elucidated that the theory of value could be discussed from two standpoints viz., monopoly and perfect competition. This new approach with two alternative analysis to the situation of reality shook the very foundation of the classical theory.

Recently two names are associated for the theory of imperfect competition namely Edward Chamberlain and Mrs. Joan Robinson. The former had written a book, The Theory of Monopolistic Competition, the latter, The Economics of Imperfect Competition. These two masterpieces appeared almost at the same time. Dr. Chamberlain claimed that he should be regarded a pioneer in the field of imperfect competition since he had put the same idea in his Ph.D. thesis presented in 1927. Mrs. Joan Robinson, however, wrote in the foreword to her book that Professor Chamberlain's Theory of Monopolistic Competition provides a plentiful group of coincidences. She further said, "it appeared too late for me to notice them in detail".²

Mrs. Robinson introduced two notions in her theory of imperfect competition, namely 'marginal cost' and 'marginal revenue'. The former implies the net addition to the total cost and latter indicates the net addition to the total revenue earned by the additional unit. According to her, if rival producers are seen producing distinctive articles, it is certain that the competitive theory will be put aside. A monopoly may be said to exist when consumers are ready to pay higher prices for the product of a producer than for the competing goods (product differentiation of similar quantity). She lays emphasis on the
basic proposition - the demand curve of the individual firm will slope downward.

It is explicitly necessary to note that under imperfect competition, every producer is a kind of monopolist subject only the possibility of consumers substituting rival products for the one produced by him. The demand curve, under such conditions, is affected by the degree of elasticity because if the latter is less than unity at the point of estimated output the marginal revenue would be either zero or less. If this is the case, it would advisable for the producer to contract the market operations. If the demand for the commodity varies, elasticity and marginal cost will also be affected, and with a change in the marginal cost, the direction of price movements must change, it will depend upon the elasticity of the new demand curve. The factors that underline these formal changes (greater income of buyers, increase in their number, higher costs of possible substitutes and elimination of rivals from the market) will affect total demand; and their impact will be different for different producers.

We can easily admit without any hesitation that consumers take into account not only the price factor but also the quality of the product, cost of transportation, service, location and credit facilities on the basis of which, they distinguish between sellers. Mrs. Robinson did not mention the problem of product differentiation, but it is clear that it permeated her analysis. Extending her analysis to input factors she lays emphasis on the fact that the expansion under the conditions of limited supply will increase their prices, and if the producer can have choice between the relatively scarce and relatively
plentiful factors, he would possibly substitute one for the other. Even then, the economics enjoyed by large scale production can counterbalance any increase that accrues from the use of scarce factors. She also discussed buyer's monopoly, i.e. monopsony. She pointed out that where labour is the input factor, two things are useful - the organization of trade unions and the enactment of minimum wage legislation impose the conditions of equality of two marginal measures - marginal total value and marginal physical product, and foster a better utilization of economic resources of the country. She believed that exploitation takes place on account of the absence of perfect elasticity in the supply of labour, which can be enforced effectively by trade unions.

Mrs. Joan Robinson explained Keynesian economics in an analytical manner with a critical discussion. She elucidated that the traditional theory of money "ceased to be the Theory of Money, and become the Analysis of Output". The orthodox economists had used the tools of demand and supply to explain the purchasing power of money in their theories of money. She argued that the changes in the price level has a severe repercussion in the working of an economy because it affects the volume of output, employment, and wealth of the community as a whole. But till now no economist takes pain to study these variables in their quantity theories of money. Robinson pointed out that the Fisherian Equation and Cambridge Equation of the Quantity Theory of Money are similar in their analysis but different in their approach. This can be illustrated as follows:
Cambridge Equation

\[ II = \frac{KR}{M} \]

where \( II \) represents purchasing power of money

\[ R = \text{the real National Income} \]
\[ K = \text{the proportion of real Income held in the form of money i.e., cash and bank balances.} \]
\[ M = \text{Quantity of money} \]
\[ KR = \text{demand for money in terms of real wealth.} \]

Fisherian Equation

\[ MV = PT \]
\[ P = \frac{MV}{T} \]

where \( P \) represents price level

\[ M = \text{total quantity of money} \]
\[ V = \text{its velocity of circulation} \]
\[ T = \text{volume of transaction} \]
\[ MV = \text{total quantity of money in circulation} \]
\[ PT = \text{total volume of transaction.} \]

But the exponents of the two equations were in a paradoxical position because they were not satisfied with their own apparatus. In the case of Fisherian Equation, Robinson wrote "a theory of money which does not mention
the rate of interest is not a theory of money at all".4

Mrs. Robinson explained that when Keynes, wrote his Treatise on Money, he failed to realize the fact that the subject with which he was dealing was the analysis of output. Keynes discussed the relationship of the quantity of investment to the quantity of saving in his Treatise. Further, he also pointed out that "savings exceeds investment, consumption goods can only be sold at a loss. Their output will consequently decline until the real incomes of the population is reduced to such a low level that savings are perforce to equality with investment."5

Mrs. Joan Robinson in her paper 'Kalecki and Keynes' discussed that both these two economists came from different political and intellectual background but reached the same conclusion. Keynes The General Theory of Employment, Interest and Money was published in 1936 whereas Kalecki's book Essays in the Theory of Business Cycles was published in Polish in 1933. Both of them used the concept of effective demand in their analysis. Kalecki viewed that the problem of unemployment could be reduced by investment in the economy. His analysis avoided the concept that there is equality of saving and investment. He did not study the theory of unemployment through Kaln multiplier. Kalecki never learned orthodox economics whereas Keynes did. Kalecki studied the economics of Marx but Keynes was unable to understand Marx. Kalecki was even successful to elaborate the concept of marginal efficiency of capital of Keynes in a clear manner. Both of these two economists claim the credit for the Keynesian revolution. Keynesian economics
cannot be understood without taking into consideration both of them. It is absolutely difficult to say that Kalecki was first and Keynes was second or Keynes was first and Kalecki was second. We need a critical research in these context.

There was a belief in Britain and Austria (1929) that both private and public expenditure did not increase employment in the economy. But Keynes repudiated this concept and formulated a theoretical model in this context. According to Keynes, in a market economy if there is unemployment of workers and of productivity capacity, it is necessary to increase expenditure in terms of money (from private sector from the general public) to increase output and employment in the economy. Britain and America accepted the notion that 'a high and stable level of employment' to give solution to the problem of unemployment in the contemporary world. Keynes' theoretical models are not sufficient to analyse the complex problem of the world that was prevailing after 1960s, i.e. unemployment, low productivity, problem of balance of payments and inflation. She wrote, "The Keynesian still remains to be made, both in teaching economic theory and in forming economic policy".

Marxian Economics

Robinson attempted to analyse Marxian economics with a comparison of Marx and Marshall, and Marx and Keynes. Marx's explanation was based on labour-value of money as the cost of account. There is no cost of production. Labour only produces value. Marxian tool of analysis is based on three
ratios (i) the rate of exploitation, (ii) the rate of profit on capital and (iii) organic composition of capital. He divided the total gross annual output of the industry into three components, viz., (i) constant capital is raw material entering into final output, wear and tear of plant. It can be represented by the symbol 'C'; (ii) variable capital 'V', i.e. annual wage bill and (iii) surplus 'S', i.e. interest, rent and profits. Marx wrote \( \frac{S}{V} \) to denote the rate of exploitation and \( \frac{S}{(C+V)} \), the rate of profit on capital. Marshall's familiar economic axiom that a man purchases labour and commodities with that portion of his income which he saves just as much as that which is said to spend. Let us make another comparison between Marx and Keynes. Marx regarded that capitalist system itself contains the germs of its own destruction. Keynes wrote that capitalist system as a permanent almost a logical, necessity. According to the latter, the interest obtained by owning capital as the reward of abstinence or waiting, and profit as the reward of enterprise. Marx treats interest, profit as the reward of enterprise. Marx treats interest, profit and rent as unpaid labour or surplus value. Keynes wrote: "It is preferable to regard labour ... as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand."

The essence of Keynes theory can be enumerated in the following manner. The demand for goods falls short of the productive capacity of industry because of an unequal distribution of income. The market is unprofitable due to the fact that consumers do not have the purchasing power. The people who possess wealth are not genuine consumers but they are saver. If there is sufficient demand for new capital investment especially in houses, industrial equipment,
means of transport, growing stocks of goods etc. and if and only if savings are utilised then the system functions adequately. Savings do not provide guarantee for capital accumulation. On the contrary, saving limits the demand for consumption goods and so limits the demand for capital to produce them. Profitable outlets for investment creates booms.

In the nineteenth century when there were large opportunities for profitable investment in exploiting new inventions and developing new continents, there was long period of prosperity. In war time pseudo-prosperity occurs because war created unlimited demand. For a highly-developed capitalist system, prosperity is not the normal state. Increased wealth and saving makes prosperity harder to attain. Keynesian theory is inapplicable to analysis post-war inflation. But still it revolutionized the theory of International Trade. Marxian theory and Keynesian theory are similar in many respect but still less attention is paid to their comparative study by English academic economists. Mrs. Joan Robinson pointed out two serious defects of Marxian apparatus and she wanted to remedy them, so that Marxian economics can be easily applied to solve the problem of capitalist economy of present day.

In Marxian terminology constant capital, i.e. 'C' represents productive equipment (factories, machinery etc.) and raw material; variable capital 'V' implies the wage bill and surplus 'S' include rent, interest, and profit. So, C+V+S represent the flow of production say per year, then 'C' is not the stock of capital invested, but the annual-wear-and tear and amortization of capital $\frac{S}{(C+V)}$ is the share of profits in turnover, and not the value of profit on capital
invested. The rate of profit which (for Marx as in orthodox systems) tends to equality in different lines of production and the rate of profit which tends to fall as capital accumulates is not $\frac{S}{(C+V)}$, but the rate of profit on capital invested. Marx himself was well aware of this point, but his habitual use of the expression $\frac{S}{(C+V)}$ for the rate of profit on capital is excessively confusing. Academic economists are much concerned without output and other concepts such as 'real national income' the level of real wages'. But Marx methods of analysis in terms of value do not take into consideration these aspects as a whole. The difference between Marx and pre-Keynesian economics is on the question of the total supply of capital and the rate of profit on capital as a whole.

International Economics

So far as International Economics is concerned, Mrs. Robinson argued that every industrial nation is anxiously looking for prospects of sales. The International Market has not increased in such a manner as to absorb the sales of all countries of the world as a whole. As a consequence, each government feels it a worthy and commendable aim to increase its own share in world activity for the benefits of its own people. This phenomenon is called 'New Mercantilism' by Joan Robinson. The main characteristic of new mercantilism is that every nation wants to earn a surplus at the cost of other nations.

Some economists regard Mrs. Robinson a Marxist. But she was not a Marxist though she studied in detail Marx's capital. In this context we can
quote her, 'capitalism, if it is managed with intelligence and good-will, may continue to flourish in economics that are already developed'.

In conclusion, it can be said that Mrs. Robinson is indeed a radical economist. She has attempted to reconcile different branches of economics, namely, Classical, Keynesian, Marxian, etc. Her contribution has opened new fields of investigation in economic thought and doctrine.

MICHIO MORISHIMA

Like Mrs. Robinson, Michio Morishima is regarded a radical economist. Academicians or orthodox economists have regarded Walras as the pioneer in the general equilibrium theory. But in reality it is incomplete. Even Marx should get credit for equilibrium analysis. Morishima has mathematically proved equilibrium economics. He opined that there should be revision of Keynesian, Marxian and Walrasian models in order to assimilate all aspects of human life.

Life Sketch

Professor Morishima, the Japanese mathematical economist, was born in 1923 in Osaka. He took his B.A. degree in 1946 from the University of Kyoto. He taught at the University of Kyoto in 1950 and moved to the University of Osaka in 1951. He spent two years at the University of Oxford in England and Yale University in America from 1956-58. Finally, he emigrated
to Britain in 1968, became first a Professor of Economics at the University of Essex (1968-70). Then he became a Professor of Economics and Chairman of the International Centre for Economics and Related Disciplines at the London School of Economics.

His Works


His Contribution

Morishima says that it is a regrettable fact that economists have for a long time been divided between the 'orthodox' and the Marxian camps as a result of cliquishness; each school has lost touch with the other and has become inbred. In his view, Marx and Walras should really be honoured together as the progenitors of the modern dynamic theory of general economic equilibrium. Marx was the first economist to obtain a vigorously scientific macrodynamic model and his work is still highly relevant for contemporary economics. His main contributions are reviewed below:

*Labour Theory of Value*

The labour theory of value has two functions in Marxian terminology
namely (i) to explain the equilibrium prices (or the exchange values) of commodities, around which actual prices fluctuate over time, and (ii) to provide aggregators, or weights of aggregation, in terms of which a large number of industries (or primitive sectors) are aggregated into a small number of 'departments'. Marx explicitly explained the first part in his *Capital* and was unaware of the second part. The followers as well as the antagonists of Marx explained only the first part of the labour theory of value. But Morishima believes that the second aspect is more important as compared to the first aspect. Marx formulated two definitions of value. According to the first definition, "all that these things now tell us is, that human labour-power has been expended in their production, that human labour is embodied in them. When looked at as crystals of this social sub stance, common to them all, they are values."  

According to the second definition of Marx, "we see then that that which determines the magnitude of the value of any article is the amount of labour socially necessary, or the labour-time socially necessary for its production."  

Marx actually regarded these two definitions as synonymous but Morishima argued that only with rigorous proof their equivalence can be provided. The latter also pointed out that there are hidden assumptions in the Marxian theory of value. He believed that the most basic assumption of Marx must be that the technology has already been developed to such a level that production processes which are 'productive' are available to the capital goods industries of the society. Morishima stated that "Marx took a particular commodity (say, capital good I) as the standard commodity (or 'value numeraire')
in terms of which the value of every other commodity was expressed. The ratio of the value of commodity 'i' to the value of the standard commodity, \( \lambda_i/\lambda_1 \), which Marx called 'Relative value' expresses a definite quantity of the standard commodity, 'q', which is equivalent, in 'value', to one unit of commodity 'i'; that is to say, \( \lambda_i = q\lambda_1 \), which means that the same quantity of value substance (congealed labour) is embodied in one unit of commodity 'i' and 'q' units of the standard commodity'.

We can quote from Marx capital Vol.I that "the two commodities (of these quantities) have each cost the amount of labour or the same quantity of labour-time".

As far the society of simple commodity production is concerned Marx wrote "the labourers themselves are in possession of their respective means of production and exchange their commodities with one another". He explained his theory of value by characterizing commodities as something two fold, both 'objects of utility' and at the same time, 'depositories of value'. In many respects Marx theory of value is similar to that of the Marginal Utility Theory of Consumers Demands.

Morishima is of the opinion that Marxian system has dual accounting systems: one system in terms of value while the other in terms of price. But many notable economists, viz. Sweezy, Joan Robinson and Samuelson were confused regarding this point because they often treated values and prices as synonymous. He also explained the theory of exploitation of Marx with
the help of a graph. Morishima assumed that technology is developed in such an extent that capital goods or means of production are productive. The techniques adopted by industries are so productive that the value of wage goods \( \Lambda_1 \) are low enough to make the total value of the means of subsistence \( \Lambda_1^B \) less than the maximum length of the working day \( T \). Thirdly, the actual working day \( T \) is long than the necessary labour time \( \Lambda_1^B \). In other words, the 'real-wage rate' \( \omega \) is less than the maximum rate, \( 1/(\Lambda_1^B) \). Under these conditions the formulae

\[
e = \frac{\text{Surplus labour}}{\text{Necessary labour}}
\]

('e' denotes the rate of exploitation) enables us to draw the exploitation rate curve in the \( e, w \) plane. In the diagram it traces out a downward sloping curve, starting from \( \omega = 1/T \) and ending at \( \omega = 1/(\Lambda_1^B) \). Marx wrote 'the working day (hence, the reciprocal of the working day, \( \omega \)) is thus not a constant, but a variable quantity'. So the problem of determining the rate of exploitation is reduced to the problem of determining the length of the working day. When the worker's position is very weak, the working day will be prolonged as much as possible and the rate of exploitation will be maximised at \( e \), the rate corresponding to \( w = 1/T^{''} \).\(^{12}\)

Morishima assumed equilibrium prices and equilibrium rate of profit in the economy. He examined the relationship between the equilibrium rate of profits and the rate of surplus value. Let us first discuss Marxian view
of profit. He stated that "the capitalist does not produce a commodity for its own sake, not for the sake of its use-value, or for his personal consumption" but is interested in "excess value of the product over the value of the capital consumed by it". The surplus value is a surplus over the advanced total capital.

Marx represents the proportion of this surplus to the total capital by the fraction $S/C$, in which $C$ stands for total capital. The rate of profit, i.e. $S/C = S/(C+V)$, as distinct from the rate of surplus value $S/V$. On the other hand, 'the ratio of this surplus value to the advanced variable capital, or $S/V$, is called the rate of surplus-value and designated $S'$. Therefore, $S/V = S'$ and consequently $S = S'V$. Now, substituting for $s$ its equivalent $S'V$, we find $P' = S'V/C = S'V(C+V)$, which equation may also be expressed by the proportion, $P' : S' = V:C$, where $P'$ represents the rate of profit. It follows from this proposition that the rate of profit, $P'$ is always smaller than $S'$, the rate of surplus-value, because $V$, the variable capital is always smaller than $C$, the sum of $V+C$, or the variable plus the constant capital. Marx made the application of the above mentioned equations of the rate of profit, $P' = S'V/C$, to the various possible cases.

Marx obtained the results that the rate of profits of two different capitals or one and the same capital in two successive different conditions are equal only if the percentage composition of the capitals is the same if their rates of surplus value are identical. He also argued that they are unequal if the rates of surplus-value are the same and the percent composition is unequal. Marx arrived at the point regarding the 'falling rate of profit' on
the assumption that surplus value is created by variable 'capital only and that there is a tendency for the proportion of the variable capital to that capital to decline in the long run. Morishima argued that Marx derived these formulas and results under the assumptions that the profits and surplus values of individual industries are proportional to each other so that profits may be normalized at the level such that they are numerically equal to the corresponding surplus value. He assumes that \( \Pi_i \) and \( S_i \) stand for profits and the surplus value of industry \( i \); and let \( C_i P \) and \( V_i P \) be constant and variable capitals in terms of prices. If we, further, assume \( \Pi_i = S_i \) for each industry \( i \) (as Marx did in Part I of the volume III), then we have \( C_i P + V_i P = C_i + V_i \) for each \( i \).

Hence

\[
\Pi_i = S_i = \frac{V_i}{C_i + V_i} \quad (i = 1, \ldots, m)
\]

where \( \Pi_i \) and \( S_i \) are the rate of profit and the rate of surplus value respectively. We may then ask under what conditions we have \( \Pi_i = S_i \) and \( C_i P + V_i P = C_i + V_i \) for all \( i \), and we shall find that we may equate profits and surplus value, and prices and values, if and only if all industries have the same value-composition of capital. Therefore the equation (1) imply that

\[
\frac{C_1}{V_1} = \frac{C_2}{V_2} = \ldots = \frac{C_m}{V_m}
\]

So that it follows from (i) that
Hence we cannot derive Marx's proposition (ii) quoted from the formula (i), whilst in his proposition (i) the condition that 'the percent composition of the capital is the same is redundant'.

**Marx's Transformation**

According to Morishima, Marx's transformation problem consists of two sub-problems: (i) conversions the rate of surplus value into the rate of profit and (ii) conversion the values of commodities into their production prices. Before detailed discussion of the transformation problem in Marxian analysis, it is evidently necessary to draw at least three conclusions of Marx from his Capital, Vol.III. First, he assumed that "the sum of the prices of production of all commodities produced in a society - the totality of all branches of production is equal to the sum of their values". Secondly, he also stated that "the cost-price of commodity is always smaller than its values". Thirdly, he explained that "surplus value and profits are identical from the standpoint of their mass". Fourthly, he elucidated that "aside from possible differences in the periods of turnover, the price of production of the commodities would then equal their value only in sphere in which the composition (of capital) would happen to be (the same)". Last but not the least, he further, stated that "the value of the commodities produced by capital (of higher value composition) would, therefore, be smaller than their price of production of the commodities (produced by capital of lower composition) smaller than their value".
In the first three statements Marx often confused on account in terms of values with the corresponding account in terms of price. Inspite of the fact that price and value are two different concepts. The former is measurable in terms of money while the latter is measurable in terms of labour time. According to the last two statements, it is evident that Marx was aware that under a capitalist system of production, 'the law of value' was not in force in its pure and simple form and that prices of commodities would deviate from their values. Therefore, transformation problem is possible if and only if the prices are normalized in such a way that they are dimensionally identical with values. The question of normalization is not a difficult task. If prices are measured in terms of labour they can be compared with values. Morishima believed that the transformation problem in Marxian economics can be found correct only if there will be some revision of Marx's proposition under additional assumptions. His view is not totally correct in this context since Marx transformation problem still has its own validity.

Samuelson wrote: "This mathematical fact (that prices of commodities will not be proportional to their values when there is exploitation) will not be of comfort to one looking for a labour theory of value as a base point for a theory of labour exploitation, the propositionality of market price to labour content applies validity only when surplus value is zero and not worth talking about".

In the transformation problem, Marx was not interested to establish
a proportionality between values and prices. But on the other way round he shows that individual exploitation and individual profits are disproportional unless some restrictive conditions are imposed. Marx also wrote that the rate of profit is from the very outset distinct from the rate of surplus value. He, further, states that the rate of profit may rise or fall but the rate of surplus value remains the same. Because capitalists are mainly concerned with the rate of profit. The transformation of values into (different) prices of production serves to obscure the basis for determining value itself. Marx wrote: "The individual capitalist (or all the capitalists in each individual sphere of production), whose outlook is limited, rightly believes that his profits is not derived solely from the labour employed by him or in his line of production. This is quite true, as far as his average profit is concerned. To what extent this profit is due to the aggregate exploitation of labour on the part of the total social capital, i.e., by all his capitalist colleagues - this interrelation is a complete mystery to the individual capitalist; all the more so, since no bourgeois theorists, the political economists, have so far revealed it."

**Aggregation Problem**

So far as the aggregation problem is concerned, Marx dealt the simplest case of aggregate. He included all capital goods into one department and all wage and luxury good industries into another department. In volumes I and III, he discussed the Microeconomic analysis of value and prices. In Vol.II the Macroeconomics of reproduction and accumulation. Marxian aggregation
in terms of value is comparable to Keynesian aggregation in terms of wage units. Marx pointed out that relative market price fluctuate with time. As a consequence, they affect the coefficients of the macroeconomics model in terms of wage units, on the basis of which macro analysis are made in order to explain market prices and other things that happen in the market. Samuelson, stated that the transformation problem in Marx is a 'pointless' problem.

French economists were very much influenced by Quesnay's Tableau Économique and they were in search of a theory of general equilibrium. Marx, too, was profoundly influenced by Quesnay and formulated his models of general equilibrium as early as Walras. Marx's model of simple reproduction is similar in many respect to that of Walras static general equilibrium system of production. But Marx analysis was wide than Walras because in his theory of reproduction he was concerned not only with the usual problem of reproduction of commodities, but also with the reproduction of the capitalist class and the working class, and thus the reproduction of the capitalist character of the entire process of production. Marx's models consists of sub-systems which are not only 'duals' of each other but also in addition to a price - determining sub-system which is a dual of the output determining sub-system, a value determining sub-system which is also a dual of the output sub-system, so that they have dual duties.

Nevertheless, the duality between the value and output sub-systems enabled Marx to aggregate his models in terms of values into two departments
by assuming, as a first approximation to reality, that the value structure of the industry is similar which each of the two major departments. Let us first analyse Marx's static model. It is assumed in the simple reproduction model that both capitalists as well as workers do not save. Their whole income is entirely devoted to consumption of wage goods to the extent that they are necessities of life and luxury goods. The consumption of the capitalist class in terms of values equals the total surplus value acquired by exploiting workers in terms of prices, it equals the total amount of profit earned.

Marx constructed the model of simple reproduction not for its own sake, but as an introduction to the dynamic model of 'reproduction in an extended scale' of which it is a special case, with the steady rate of growing being zero. Reproduction on an extended scale is not possible in a society where it is technically and biologically infeasible to exploit workers so as to yield a total surplus value greater than the value of the necessities of life which the capitalist require. Marx assumed that the portion of the newly created money capital capable of being converted into variable capital will always, find at hand the labour-power into which it is to transform itself. Marx's assumption is similar to that of Von Neumann did, that the labour force could be expanded at a rate which was higher than in the maximum rate of growth of capital or at least that the supply of labour could adjust itself quickly and smoothly to demand.

Marx introduced a peculiar investment function according to which (1) capitalists of department I devoted a constant proportion of their surplus
value to accumulation, (2) it was reinvested in department I so that it was converted into constant and variable capital, (3) capitalists of department II adjusted their investment in order to maintain equality between demand and supply for capital goods.

According to Morishima in Marxian economics, with the advance of accumulation the proportion of constant to variable capital changes with the growth of total capital, its variable constituent or the labour incorporated in it also increases by a constantly diminishing rate. Technological improvements in production reduce the demand for labour force "the labouring population produces along with the accumulation of capital produced by it, the means by which itself is made relatively superfluous in turned into a relative surplus population. It forms the industrial reserve army which is a condition of existence of the capitalist mode of production and a mass of human material always ready for exploitation.

According to Marx, the constant or periodical increase of the reserve army will grow, "the mass of misery, oppression, slavery, degradation, exploitation, but with this too grows the revolt of the working class, a class always increasing in number and disciplined, united, organized by the very mechanism of the process of capital production itself. The monopoly of capital becomes a fetter upon the mode of production, which was sprung up and flourished along with under its centralization of the means of production and socialization of labour at last reach a point where they become incompatible with their capitalist integument. The knell of capitalist private property sounds. The
expropriators and expropriated" (I,P,863).

Marx believed that an increase in the reserve army induces a decrease in the real wages, so that the capitalists are more fortunate to exploit workers at a greater rate. He, also, further elucidated that the rate of profit falls as the process of economic development advances. In his own terminology "the gradual growth of constant capital in relation to variable capital must necessarily lead to a gradual fall of the general rates of profit so long as the rate of surplus value or the intensity of exploitation of labour by capital remain the same".

Morishima in his masterpiece, Theory of Economic Growth said 'only by treating capital goods at different stages of wear and tear as qualitatively different goods, so that each capital good newly defined can serve only for one period, can we adequately deal with the structure of capital stock'. Marx almost came up with this 'golden rule' way of treating depreciation of capital goods which was later developed by Von Neumann, but he did not follow through with it.

Marx in his Capital, Vol.I wrote: "nothing can have value without being an object of utility. If the thing is useless, so is the labour contained in it; the labour does not count as labour, and therefore creates no value." This implies that if a good is useless even though it contains a positive amount of labour, its value has to be set at zero. The actual values are generally different from the optimum values. But Marx was mainly concerned with
the former and not with the latter. Marx labour theory of value is difficult at first sight. But on a closer examination enables us to see that it is in conflict with his theory of exploitation, unless the conversion ratios are determined to be proportional to the wage rates of the various kinds of labour. We can emphasise the point that Marxian economists should be able to reinterpret the labour theory of value. If it has to determine the accounts of labour with the techniques of production actually adopted in a capitalist economy, require directly and indirectly, in order to produce commodities, it is not a satisfactory theory at all.

**Walras' Economics**

Morishima's analysis of Walrasian economics is another masterpiece of his. Walrasian theory of general equilibrium is misunderstood by many students as well as his followers. Two economists namely Schumpeter and William Jaffe praised the contribution of Walras. Schumpeter states that his inherent logic, inevitability and power impress us as a natural event. He convinces us that economic theory could be treated mathematically. He is concerned in the method and not in any specific problems. William Jaffe explained that Walras expounded his philosophy of social reform based on mathematical ideas of Victor Cousin and Etienne Vancherot calls for a conciliation of interest.

Ideological as his position was, he resisted the efforts of his Saint-Simonian friends to enrol him among their number because their socialism
was unscientific. Schumpeter and Jaffe appreciate part II, VI of the *Elements of Pure Economics*. Saying that they are richest and most important part of all Walras' three main volumes on pure economics, applied economics and social economics. Walras formulated four models of general equilibrium in these parts, they are (1) of exchange (of two and then more than two commodities) (2) of production, (3) of capital accumulation or economic growth and (4) of money and circulation. From the single principle of maximum utility, he derived demands for commodities, aggregate savings and the desired cash balance as functions of prices and the rate of interest.

Walras was influenced by his father's theory of social wealth and Cournot's theory of arbitrage. The originality in his study was free competition. He was successful to introduce mathematics in social sciences. In this context he said "the twentieth century which is not far off, will feel the need .... of entrusting the social sciences of men of general culture, who are accustomed to thinking both inductively and deductively and who are familiar with reason as well as experience. The mathematical sciences of astronomy and mechanics .... and on that day justice will be done to our work." Walras explained the phenomena of an exchange economy where all individuals are price takers. Let \( P \) be a price vector, \( P = (P_1, P_2, \ldots, P_n) \) each individual is provided with certain quantities of \( n \) commodities \( X_1, X_2, \ldots, X_n \) before trade, and wishes to convert them into \( X'_1, X'_2, \ldots, X'_n \) through exchange so as to maximise his utility function:
U = U \{X_1, X_2, ..., X_n\} \quad (1)

He will maximise it, subject to his budget equation:

\[ \sum P_i X_i = \sum P_i \tilde{X}_i \quad (2) \]

In addition, the stock of commodities he holds after trade should be non-negative

\[ X_i \geq 0 \quad (i = 1, ..., n) \quad (3) \]

In the case of an economy with two commodities, Walras wrote: "Given two commodities in a market, each holder attains maximum satisfaction of wants, or maximum effective utility, when the ratio of the intensities of the last want satisfied, or the ratio of their raretes (i.e., marginal utilities) is equal to the price." Of course, it is possible that a party to the exchange may find it to his advantage to offer the entire amount of whichever one of the two commodities he possesses to start with (i.e. to have \( X_{i=0} \) for commodity \( i \) with \( X_i > 0 \)) or to demand none at all of the other commodity (i.e. to have \( X_{i=0} \) for \( i \) with \( X_{i=0} \)). For the latter case he concluded "the quantity demanded of one of the two commodities by a holder of the other commodities becomes zero. Whenever the price of the commodity demanded is equal to or greater than the ratio of the intensity of his maximum want for it to be intensity of the last want which can be satisfied by the quantity possessed of the commodity offered (i.e. the ratio of their marginal utilities)". For
the former "the holder of one of the two commodities will offer all he possesses of that commodity demanded in exchange is equal to or less than the ratio of the intensity of the last want which can be satisfied by the commodity whenever the price of the commodity demanded in exchange is equal to or less than the ratio of the intensity of the last want which can be satisfied by the commodity demanded to the intensity of the maximum want satisfied by the commodity to be offered."

The above quotations doubtlessly proved that Walras accepted subjective equilibrium for the two commodity analysis. Walras obviously knew the fact that nothing will be changed when several commodities are exchanged. He also does not accept the British labour theory of value and French utility theory because none of them consider the elements of 'scarcity' in their analysis. According to him, "Surely, if labour has value and is exchangeable, it is because it is both useful and limited in quantity, that is to say it is scarce. Value thus comes from scarcity. Things other than labour, provided they are scarce, have value and are exchangeable just like labour itself". So far as the utility theory is concerned, he wrote : "Utility is not sufficient to create value. Besides being useful, a thing must be scarce, i.e., it must not exist in unlimited quantities; the air we breathe, the wind that fills the sails at sea or turns wind mills on land, the sun that gives us light and heat and ripens our harvests, water and steam from heated water, these and many other forces of nature are not only useful, but indispensable. And yet they have no value. Why? Because they are unlimited in quantity and everyone can obtain all he
wants of them whenever they are present all, without giving up any thing or making any sacrifice in return." It is explicitly verified by Walras in his theory of exchange that all valuable and exchangeable things are useful and the same time limited in quantity and vice-versa.

To reach an equilibrium in the real world, Walras assumed that for each and every commodity there was a perfectly organised market. Walras minimised monopoly elements in his analysis and assumed that the exchange of several commodities for one another in the market is empirically solved by the mechanism of competition. He wrote "the markets which are best organised from the competitive standpoint are those in which purchases and sales are made by auction, through the instrumentality of stock-brokers, commercial brokers or cries acting as agents who centralize transactions in such a way that the terms of every exchange are openly announced and an opportunity is given to sellers to lower their prices and to buyers to raise their bids. This is the way business is done in the stock exchange, commercial markets, grain markets, fish markets, etc. Besides these markets, there are others, such as the fruit, vegetable and poultry markets, where competition, though not so well-organized, functions fairly effectively and satisfactorily. City streets with their stores and shops of all kinds - baker's, butcher's, grocer's, tailor's, shoemaker's, etc. - are markets where competition though poorly organized, nevertheless operates quite adequately. Unquestionably competition is also the primary force in setting the value of doctor's and lawyer's consultations, of the musician's and the singer's recitals, etc."
Moreover, what is bought and sold in the stock exchange of a large investment centre like Paris or London are "titles of property in shares of very important kinds of social wealth, such as fractions of state and municipal loans or shares of railways, canals, metallurgical plants etc."\textsuperscript{16} The prices generally do not deviate from equilibrium values because important commodities have their own well organized markets even less competitive commodities are able to find competitive equilibrium under the pressure of competition.

Walras was also concerned with the problem of formation of general equilibrium in an economy where production is simultaneous with exchange. In this economy both inputs and outputs must be determined. Let us assume that the available quantities of the factors of production are given. Walras did not make the distinction between producible and non-producible factors of production. He believed that all factors are owners of some factors of production. "The economy has only two groups of goods and services; commodities and factors of production. There are a number of industries or firms, each producing a single commodity by means of commodities and factors, while factors are not produced. There are consumers who buy commodities with the income from the factor they own. However, there are no banks nor government and no international trade. Long-run dynamic factors such as production periods and expectations, as well as investment, are all neglected."\textsuperscript{17} Walras implicitly made the assumption in his model that the aggregate excess profit (or supernatural profit) which may accrue in a positive or negative amount in the process of establishing an equilibrium is not distri-
buted among individuals, so that the amount is saved or disaved by firms. Morishima argued that in order to correct Walras' Law, the excess profit should be distributed among individuals according to their ownership of capital goods. But it is not necessary that excess profit should be distributed to individuals according to their ownership of capital, it can be reinvested in the economy for further production and to achieve a high economic growth rate.

We shall make a comparison of Walrasian rules with the Keynesian ones with respect to the stability of equilibrium in production. In a number of ways, Keynesian economics is different from neo-classical theory of Walras. First, Walrasian process of grouping in production is based on dual adjustment rules; (i) the prices of commodity is raised or lowered whenever there is positive or negative excess demand for that commodity or (factor); and (ii) the output of a commodity is expanded or reduced whenever the excess of its price over its cost of production is positive or negative. In Keynesian economics, prices and outputs are always adjusted according to the following rules (a) the price of a product is raised (or lowered) if its current price falls short of (or exceeds) its minimum cost of production (b) factor prices are rigid downwards; they remain unchanged in spite of an excess supply of factors, though they rise if there is excess demand, (c) where there is an excess demand for (or supply of) the product of an industry, it increases (or reduces) its output. Keynes distinguished the effective demands for commodities and factors arising from actual income from the notional demands assuming a state of full employment whereas in Walrasian model full employment of all factors was automa-
tically established. Walras accepted Say's law whereas Keynes did not accept it.

Let us analyse a neo-classical model of Walras. In this model $m^{th}$ is the factor of production. Let us represent Walrasian rules in terms of differential equation in the following manner. The differentiation with respect to time is denoted by a dot above the relevant symbol in this model.

\[ \dot{P}_i = \sum_j \zeta_{ij} (i=1, \ldots, n) \] (1)

\[ \dot{V}_k = \sum_r \gamma_{rk} (k=1, \ldots, m-1) \] (2)

\[ \dot{X}_{s_i} = \sum_j S_j = (i=1, \ldots, n) \] (3)

Where

\[ \zeta_{ij} = \begin{cases} E_i & \text{if } P_i > 0 \\ \max (E_i, 0) & \text{if } P_i = 0 \end{cases} \] (4)

\[ \gamma_{rk} = \begin{cases} F_k & \text{if } V_k > 0 \\ \max (F_k, 0) & \text{if } V_k = 0 \end{cases} \] (5)
In the above equations $E_i$ represents the excess demand function for commodity $i$, $F_k$ means the excess demand function for factor $K$; $C_{s_i}$ the excess profit from process $S_i$ (i.e. the $S_i^{th}$ process of industry $i$); $P_i$ and $V_k$ the prices of commodity $i$ and factor $K$, respectively; $X_{s_i}$ the output produced by process $S_i$; $\tilde{X}_{s_i}$ an output of the same process which is so large but it is not producible, because it causes a shortage of some factors regardless of the production level of other processes; and $\mathcal{U}$ and $\mathcal{W}$ the coefficients of price and output flexibilities, respectively. Equation (2) do not include the equation for factor $m$, which is the numeraire, and $V_m$ is always fixed at 1. The qualifications (4) and (5) state that where excess demand for a commodity (or factor) becomes negative when its price is zero, the price is no longer diminished but stays at the zero level; otherwise the prices of goods and factor increases (or decreases) if there is an excess demand (or supply) in the corresponding market. The qualification (6) implies that industry $i$ no longer wants to increase the quantity it plans to produce by process $S_i$ when its production reaches the infeasible level $0$, eventhough the process is still unprofitable i.e. $G_{s_i} < 0$ otherwise the quantity produced by the $S_i^{th}$ process increases (or decreases) according as it yields a positive (or negative) excess profit.

$$
\sum_{s_i} s_i = \begin{cases} 
G_{s_i} \text{ if } X_{s_i} = \tilde{X}_{s_i} \\
\min (G_{s_i} ^'0) \text{ if } X_{s_i} = 0 \\
\max (G_{s_i} ^'0) \text{ if } X_{s_i} = \tilde{X}_{s_i} 
\end{cases}
$$

(6)
Morishima praised Walras more for his growth and money theories than his exchange and production theories. Walras' growth theory did not consider the assumption that the stocks of goods and services available for consumption and production are constant. It is not necessarily required in his growth theory that there should be identity between aggregate saving and aggregate investment in a particular market. Let us quote from the *Elements of Pure Economics*, "Consequently, it is not enough for the landed capital, personal capital and capital proper .... to produce new income, our three categories of capital must also produce new capital goods proper to replace the capital goods worn out in use and destroyed by accident, and even to increase, it possible, the existing quantity of capital proper. Here we have one of the indices of economic progress. Imagine that we arrest the process of production again after a certain interval of time .... as we did before, and imagine that we find an enlarged quantity of capital goods proper. That would be a sign of a progressive state. One of the characteristic traits of economic progress is an increase in the quantity of capital goods proper."\(^{20}\)

According as "the excess of income over consumption in the aggregate is greater or less than the excess of consumption over income in the aggregate, an economy is either progressive or retrogressive ... New capital goods are exchanged against the excess of income over consumption; and the condition of equality between the value of the new capital goods and the value of the excess gives us the equation required for the determination of the rate of new income."\(^{21}\) Walras defined savings as the excess income over consumption.
He assumes a pure credit economy in which individuals can only save in his model either in the form of bonds or by increasing the quantities of durable goods they hold. He believed that his general equilibrium theory of capital formation as the real growth theory. So far as the growth model of Walras is taken into consideration, he elucidates that the capitalist, landowners and workers save their incomes in the form of capital goods for production. The real capital which is saved by different classes in the economy are lent to entrepreneurs or firm for investment in the economy. In his growth he was confined himself to Say’s world in order to avoid logical inconsistency. Walras growth model mainly deals with temporary equilibrium. It will be established in a particular period, provided that prices, outputs and investments are all perfectly flexible. He wrote "equilibrium will be established effectively by the reciprocal exchange between savings to be accumulated and new capital goods to be supplied with a given period of time, during which no change in the data is allowed". According to Morishima the economic growth of Walras is similar to Hicks' approach in his Value and Capital. Walras also elucidates that in order to achieve reality "we must drop the hypothesis of an annual market period and adopt in its place the hypothesis of a continuous market. We pass from the static to the dynamic state".

Walras' fourth model of general equilibrium can give a comprehensive, analytical picture of the real world. It deals with an economy where goods and services are determined in terms of money. Trades are done in exchange of money. Both consumers and producers hold money for the future. In the
models of exchange, of production and of capital accumulation, the importance of money has been eliminated. Hence, he wrote: "the time has now come to introduce these elements in order to complete our general problem of economic equilibrium." Morishima mentioned that money has three functions namely (i) as standard of value, (2) as an accepted means of exchange and (3) as a store of value. Walras rightly explained that the function of money as a store of value can be explained not by introducing it into the exchange (or production) model, but by monetarizing real growth theory. In the Walrasian concept, there is no demand for money in the system of pure exchange and that of simple reproduction, since there is no place for saving and investment in these systems.

Walras' economy consists of four classes of people, landowners, workers, capitalists and entrepreneur. According to him the entrepreneur is a distinct fourth person, 'whose role is to lease land from the landowner, hire personal faculties from the labourers and borrow capitalists', in order to combine the three productive services in agriculture, industry and trade. Morishima is of the opinion that Walras' model is incomplete because he was concerned with an economy where capital goods and inventories directly owned by capitalists are rented to firms or entrepreneurs, and decisions concerning investment are, therefore, made by capitalists (i.e. savers) themselves so that there is no inconsistency between investment and saving such as Keynes emphasized. In such an economy there is inconsistency between investment and saving. It is due to the fact that investment decisions are made by entrepreneurs
or executive of firms, but saving decisions are taken by capitalists. Walras stated that in the monetary economy, the only way people can acquire (or dispose of) money is by supplying (or demanding) commodities.

In Walrasian general equilibrium theory of interest, there is adjustment of the rate of interest and the absolute level of prices. Walras said that equality between the two sides of the equation, i.e. saving investment equation, is achieved through an increase or decrease in the price of new capital goods brought about by a fall or rise in the rate of interest, according as the demand (savings) is greater than the supply (investment). The price of the service of money or the absolute price level is established through its rise or fall accordingly as the desired cash balance is greater or less than the quantity of money.

In conclusion, it may be said that Morishima's view that Walrasian theory needs revision is very tenable. In his three models, Walras did not pay much attention to the role of money. We might agree with Clower that money is the principal means of transaction in the economy. Walras pointed out that value is determined by scarcity. Scarcity is not the only factor which can determine value. The forces of demand and supply are equally necessary to determine value. Walras' general equilibrium is not free from weakness but undoubtedly it is a classic so far as equilibrium analysis is concerned.

Radical economics emerges with new arguments with mathematical validity. Radical economists have refuted the orthodox economic theories
and their analyses are multi-dimensional. Both Joan Robinson and Michio Morishima did not completely ignore Marx's contribution, but they rather held it to be still valid in the present world. They too believe that both Marxian and non-Marxian economics require revision and reinterpretation to maximise human welfare.

Notes and References


2. Robinson, Joan (1933), Economics of Imperfect Competition, Macmillan, PV III.

3. ———, (197*^), Selected Economic Writings, Bombay, Oxford University Press, p.1.


8. Ibid., p.103.

10. Ibid., p. 39.


12. Ibid., p. 55.


16. Ibid., p. 84.


18. Ibid., p. 59.

19. Ibid., p. 61.


21. Ibid., p. 269.

22. Ibid., p. 315.