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A criticism of Pigou's welfare economics

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Thesis

A CRITIQUE OF PIGOU'S WELFARE ECONOMICS

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CHAPTER I

INTRODUCTION

(I)

The purpose of our study consists in a critical analysis of Professor A. C. Pigou's welfare concept and propositions in the light of ideas held by his predecessors as well as the concept of economic welfare as developed by later economists. Much of the controversy on the subject, after publication of the first edition of Pigou's famous treatise in 1920, centered round concepts which according to critics were beyond the scope of any scientific study. More light has been thrown on it in subsequent years and it is now generally agreed that the deficiency of the concepts did not lie so much in a lack of scientific content as in their vagueness due to the absence of rigorous and unambiguous definitions. One can, with some force, argue that many of our economists, and Pigou is no exception, have formed their ideas without paying much attention to their basic assumptions. In consequence, there are numerous propositions in economic literature, including the field of welfare economics, which would have been at least differently worded, had the writers been conscious of their hidden assumptions. Post-Pigovian literature on welfare economics has been highly useful at least in one respect, that is, in giving a sharper edge to the basic postulates and laying emphasis on their significance. Considered in this perspective, the scope of the present essay is not limited to the exclusive consideration of Pigou's ideas on welfare but extends to

the appraisal of his work in the light of a comparative approach based on a discussion of various hypotheses at issue.

Pigou's ideas on welfare first appeared in a book called WEALTH AND WELFARE in 1912. Containing essentially the same materials, but with some major changes, THE ECONOMICS OF WELFARE was published in 1920. Three subsequent revised editions appeared in the years 1924, 1929 and 1932. We shall deal with Pigou's welfare economics as presented in the latest edition (1932), unless otherwise mentioned.

Pigou's treatise in a sense occupies a unique place in the history of welfare economics. Many of the classicists, though not without exceptions, hailed laissez faire and free competition as unmixed boons to society. Maximum welfare was supposed to be the result of the working of an invisible hand without any conscious effort on the part of individuals striving their way toward it. We shall notice that all classicists were not optimists; there were pessimists too. But probably before Pigou's treatise on welfare was published, there had not been any systematic treatment of the rationale of free competition. Pigou showed that free competition would maximize welfare, if there were no divergences between marginal private and marginal social net products. But there were ample instances under a regime of free competition (let alone monopoly) which signified departures from optimum allocation or maximum welfare. There was a lot of scope for improvement in a laissez faire economy. But individuals could not be relied upon to accomplish that improvement; the intervention of the state was essential for the correction of maladjustments. In fact, times had changed since Adam Smith and David

Ricardo. Many social problems emerged on the wake of the industrial revolution which also brought tremendous material prosperity. An economist writing at that time could not but feel, to some extent, sceptic about the benefits of free competition. Pigou's treatise was a fitting testimony to the change in attitude brought about by social changes which a conscientious thinker of his calibre could not overlook. It was not a revolt against the preaching of classicists; while remaining within the classicists' fold, Pigou warned against the type of loose thinking which makes one extol laissez faire, to the utter neglect of its darker aspects. Pigou believed in the efficacy of free competition, but not without qualifications. He pointed out that there were spheres of maladjustment between private and social good where the state could profitably operate in the general interest.

This explains why Pigou could not be satisfied with a formal statement of welfare propositions. He maintained throughout an uncommon practical interest and avoided abstraction of the magnitude characteristic of a few preceding and many succeeding economists. In factual contents, his book excelled any other work on welfare economics. Apart from a consideration of welfare propositions, on a theoretical level, Pigou discussed the practical problems raised by labor and also the various ways in which distribution of national dividend could be geared toward more equality without destroying incentive, and thus increase welfare. It will not be possible to discuss all the facets of Pigou's welfare economics within the short compass of our study. We shall mainly deal with his welfare propositions, specially those relating to the distribution of resources. No attempt will be made to

undertake a thorough going analysis of his practical recommendations, which of course, follow from his theoretical analysis.

In the rest of the Chapter I, a brief presentation of welfare economics before Pigou will be made. In Chapters II, III, and IV, we shall deal with Pigou's welfare concept and propositions. In Chapters V and VI, the salient features of Post-Pigovian welfare economies will be discussed. And in the concluding Chapter VII, it is proposed to present an evaluation of Pigou's ideas on welfare in the light of those held by his predecessors and successors.

(II)

It is found helpful to consider welfare implications of Pre-Pigovian economics under three different groups, namely;

- (1) English classical approach, based on the writings of Adam Smith, Jean Baptiste Say, David Ricardo, Thomas Robert Malthus, and John Stuart Mill.
- (2) Continental classical approach, as reflected in the writings of Vilfredo Pareto, Leon Walras and Enrico Barone.
- (3) Neo-classical approach, preeminently represented by Alfred Marshall.

It is not proposed to go into the details of ideas held by each of the above theorists. Our main object is to bring out the significant conclusions bearing on welfare as revealed in the writings of groups as broadly classified.

In dealing with classical economics, economists have taken a twofold position. Some express the view that the main concern of the

classicists is to show that the equilibrium process of the free market will lead to a more efficient allocation of resources among different industries than state interference. The other view is that classicists were more concerned with the technical problem of increasing physical productivity than with the economic problem of rational allocation of resources. While both these trends of thought are traceable to classical writings the central principle is provided, Hla Myint¹ observes, by the technical concept and not the scarcity concept. The scarcity concept came into prominence only after the marginal revolution.

In the WEALTH OF NATIONS, Adam Smith² refers to two major determinants of the size of annual produce or national dividend: (1) the skill, dexterity and judgement with which labor is generally applied and (2) the proportion between the number of those who are not so employed. Extending the area of the market as a result of free trade and division of labor are two powerful means by which the primitive economy may develop. Both these factors were considered primarily in the light of their technical potentialities of increasing the size of national dividend.

"Perhaps one may say," Hla Myint observes, "that the difference between the modern concept of free competition and Smith's is that the former is a method of tightening up the allocative efficiency within a given productive framework, while the latter is a method of widening the area of the economy."³

It cannot be said, however, that Smith was not aware of the existence

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1. Hla Myint, THEORIES OF WELFARE ECONOMICS, Harvard University Press, Cambridge, Mass., p. 2.
 2. Adam Smith, WEALTH OF NATIONS, E. Cannan Ed., p. 7
 3. IBID. p. 3-4.

of subjective consumers' gains in the modern sense. In analysing the benefits of division of labor, he pointed out that apart from physical productivity, there was a further class of gains. "It gives a value to their superfluities by exchanging them with something else which may satisfy a part of their wants and increase their enjoyments."⁴ In extolling the virtues of increased production, Smith evidently had in mind the resultant increase in consumers' satisfaction.

"He seems to assume implicitly that under normal conditions, i.e., in the absence of shortage or glut, the consumer's satisfaction from a commodity may be regarded as depending on its value-in-use, as determined by its intrinsic physical properties. This amounts to assuming that quantities of satisfaction are roughly proportional to quantities of physical products."⁵

This assumption very well explains why the technical problem of increasing productivity and not the allocation concept was the main concern of Adam Smith.

After Smith, J. B. Say and Malthus made important advances in the demand approach. Say consistently expounded the view that production is creation, not of matter but of utility, and contributed to the problem of allocation but it was systematised only after the evolution of the marginalist school. Malthus was interested in the influence of total effective demand on the volume of employment. To him, wastage due to glut was more important than wastage due to maldistribution. With the advent of Ricardo, the physical approach in classical economics was reinforced and reached its climax in the views expressed by John Stuart Mill.

4. Smith, IBID, p. 413-

5. Myint, OP. CIT., p. 4.

Ricardo centered his attention on the broad problem of distributing resources between consumers' goods and producers' goods with a view to expanding the total volume of economic activity and arrived at conclusions different from those of Adam Smith. According to Smith, increase in investment or the proportion of resources used for productive purposes meant an increase in the demand for labor. This would raise wages above the subsistence level and stimulate the growth of population. Capital accumulation for Smith was always a boon resulting in an increase in population and opening up enormous scope for division of labor with a consequent rise in productivity. Ricardo did not share Smith's optimism; this is due to his discovery, simultaneously with Malthus and a few other economists, of the principle of diminishing returns. The prospect of increasing productivity with increase in the volume of labor, land remaining constant, was to him an unacceptable proposition. Contrary to Smith, Ricardo held the idea that under conditions of diminishing returns, there would be a determinate limit to which population would expand marked by the stationary state. Increased labor applied to marginal lands would raise the price of corn. Since real wages could not fall below the minimum subsistence level, money wages would rise and lower the rate of profit. Stationary state would be reached with a zero rate of profit which would destroy all incentive to capital accumulation and expansion of economic activity. "Thus the emphasis was shifted from the absolute scale of social production to the social net product or the 'net revenue' which increased at a diminishing

rate as the scale of production is expanded."⁶ From this, it followed that the aim of economic policy lay in increasing the net social product rather than the absolute scale of social output.

Another dissident view among the classicists was that of Malthus who stressed the importance of demand on economic activity. According to him, there was no automatic mechanism which equated demand to supply and attempt at economic expansion by capital accumulation would result in a glut long before Ricardo's stationary equilibrium was reached.

While Ricardo adhered to the physical output approach, Malthus considered the implications of demand on the economic system. The central theme, for both of them, was the dynamic problem of economic progress, not the concept of allocation in the static sense.

With J. S. Mill, technological considerations became predominant with a consequent emphasis on the physical approach. Under the heading "Production", technological problems like division of labor, different laws of returns in agriculture and industry, relative merits of large and small scale production etc. were discussed and distribution and exchange were considered as secondary factors whose role was to distribute national dividend as determined by immutable physical laws according to existing social institutions. The bearing of exchange on the size of the national dividend was not recognised. To quote his own words,

"The laws and conditions of production of wealth partake of the character of physical truths. There is nothing optional or arbitrary in them. Whatever mankind produce,

6. IBID., p. 7.

must be produced in the modes and conditions imposed by the constitution of external things and the inherent properties of their bodily and mental structure. The opinions, the wishes which may exist in these matters do not control the things themselves."⁷

Regarding capital accumulation, Mill argued that the excess of production above the physical necessities of producers offered the upper limit to savings. The size of national dividend was regarded as a determinate function of national capital.

Mill explicitly formulated the ideas implicit in the minds of most of classical economists that quantities of consumers' satisfaction might be assumed as being roughly proportional to quantities of physical products and therefore, a greater quantity of physical product or material wealth would be normally more preferable to a lesser quantity.

We shall conclude ~~the~~ classical notion of economic welfare with a brief note on the role of free competition in classical economics.

"A purely allocative interpretation of the classical theory of free competition," Hla Myint observes, "is based on very selective evidence" and "it is only when free competition is further reinterpreted as an auxiliary instrument of dynamic economic progress that it fits in with the fundamental classical outlook on the economic problem and gives an organic unity to their theoretical system as a whole."⁸

Smith dealt with the concept of free competition as the allocator of resources within a given closed economy. He demonstrated how free competition in the product market will equate the demand and

7. Mill, J. S., PRINCIPLES OF POLITICAL ECONOMY, Ashley Ed, P 199-200.
8. Myint, OP.CIT. p. 53.

supply of each commodity and eliminate abnormal profits in any particular industry.

"The natural price," Smith observes, "is, as it were, the central price to which the prices of all commodities are continually gravitating. Different accidents may sometimes keep them suspended a good deal above it. But whatever may be the obstacles which hinder them from settling in this center of repose and continuance, they are constantly tending towards it."⁹

Smith also discussed monopolies as one of the permanent obstacles to the attainment of competitive equilibrium which derange more or less the natural distribution of the stock of society. The effect of free competition on the factor market was also analysed by him. Free entry into industry, Smith observed, would assure the allocation of factors among different industries in such a way as to equate not only money earnings but the whole advantages and disadvantages in all these industries. Thus even though Smith's treatment was not logically as stringent as those of the continental economists, it cannot be said that he ignored the problem of allocation. This does not contradict, however, our central proposition, that free competition for the classicists was more an agency of dynamic economic progress than an allocator of resources.

Smith considered competitive equilibrium against the background of the secular tendency of the economic system to be in an advancing, stationary or declining condition. Thus natural price

"itself varies with the natural rate of each, of its component parts, of wages, profit and rent; in every society this rate varies according to their circumstances, according to their

9. Smith, OP. CIT. p. 160

circumstances, according to their riches and poverty, their advancing, stationary or declining condition."¹⁰

Smith again states that population can be kept increasing by maintaining a rising level of wages and advocates an increase in the rate of capital accumulation to raise normal wages above the minimum subsistence level. Bearing in mind the fact that continuous capital accumulation within a country will ultimately lead to the exhaustion of investment opportunities, Smith writes,

"The acquisition of new territory, or new branches of trade, may sometimes raise the profits of stock and with them the interest of money, even in a country fast advancing in the acquisition of riches."¹¹

In Book II of the WEALTH OF NATIONS, Smith strongly advocates capital accumulation as a means of increasing savings and expanding the total volume of economic activity. It may not be far from the truth to say that free competition as conceived by Adam Smith was not a mechanism of allocation of resources, but a widening process which facilitates the expansion of economic activity. This is more or less true of the other economists of the English classical school. Now we proceed to the discussion of the theory of general optimum as developed by continental economists.

(III)

The continental approach to welfare economics as expressed in the writings of Pareto, Walras, Barone and others consists in a departure from the physical level of analysis and a formulation of

10. IBID., p. 65.
11. IBID., p. 95.

the concept of subjective optimum based on the law of diminishing marginal utility. The impact of the theory of marginal utility on continental welfare economics is quite clear. It replaced the classical economists' first approximation that quantities of consumers' satisfaction were proportional to quantities of physical products and consequently emphasised the importance of the problem of allocation of resources.

There were three main gaps in the classical formulation of the problem of allocation. Smith demonstrated how right quantities of goods would be produced under free competition, but he did not show they were to be optimally distributed among the consumers. Secondly, Smith had shown how right quantities of resources would be allocated to different industries, but he did not consider the problem of right proportion of different factors in the production of a commodity and the right output of each individual producer. Thirdly, in English classical economics, the relation between the equilibrium in the consumers' market and the equilibrium in the producers' market was not clearly worked out. These problems were tackled and incorporated in the theory of general optimum by continental economists with the twin device of diminishing marginal utility theory and the marginal productivity theory.

Pareto refined the utility theory and consequently the meaning of maximisation of consumers' satisfaction. According to older conception, utility was regarded as a measurable function of the quantity of a given commodity admitting of the arithmetical properties of addition and subtraction. Pareto changed this approach by intro-

ducing the concept of the "index of ophelimity," or the individual's position of preference as determined by the alternative combination of different commodities at his choice. Instead of accepting the controversial notion of the sum of individual satisfactions, he defined the optimum as a situation where no single individual can move to a more preferred position without pushing others to less preferred positions.

Pareto observed that competition produces a maximum collective utility regardless of the distribution of income and even if the utilities of different individuals were not considered to be comparable. If the original position is one of equilibrium under perfect competition, then no possible variations, granted the existence of a fixed quantity of resources and a given technology, would constitute an improvement.

In an excellent article, written in 1908, E. Barone¹² developed in greater detail Paretian conditions of optimum, specially relating to the planning of production under collectivism.

The Paretian theory of optimum refined by the Italian economist Barone is methodologically an improvement over the classical formulation. While the English classicists were more concerned with the dynamics of economic progress, Pareto started from a given state of arts and given resources and deduced optimum conditions of allocation with a logical rigor. At the same time, he gave a new connotation to perfect competition. Free competition of English classicists as an instrumentality of economic progress is not exactly the same as

12. Barone, E., THE MINISTRY OF PRODUCTION IN THE COLLECTIVIST STATE, in COLLECTIVIST ECONOMIC PLANNING, F. Hayek Ed, London 1935 .

Pareto's perfect competition with its optimum yielding properties demanded by the logic of his analysis.

We shall not attempt here a treatment of Pareto's optimum conditions. We shall later see that the new welfare economics developed by J. R. Hicks, A. Lerner and others is Paretian in fundamentals.

(IV)

Under neoclassical notion of welfare economics, we shall consider the views expressed by its celebrated representative, Alfred Marshall.

The neo-classical economics was influenced both by the English classical tradition and the marginal revolution. While the economists belonging to this group accepted the marginal utility analysis, they also retained the classical labor theory approach to the concrete content of the economic problem. Thus while accepting the marginal utility theory, they would not carry it to its logical conclusion and analyse economic activities as directed to the satisfaction of given wants. They qualified these wants as those belonging to the material aspects of life, capable of being brought into relation with the measuring rod of money. Thus, while there was a definite economic connotation to the definition of wants, they were supposed to be variable and not fixed. The neo-classicists were aware of the economic problem of rational distribution of a given quantity of resources, but their interests extended to a discussion of institutional forces which have a bearing on the supply of resources. Instead of accepting them as data given by exogenous forces, they dealt with the technical aspects of production and the problems of ideal supply of labor and capital

required in a given state of society. Finally, the partial analysis method with its emphasis on selection and concentration of concrete details of particular sectors of the economic system is a typical outcome of the neo-classical approach. The neo-classicists differed from the classical presumption of general economic harmony by pointing out concrete cases where laissez faire did not operate toward social interests. In Pigou's treatment of the problem, this approach reached its climax, though it cannot be strictly said that he arrived at his conclusions on the basis of a partial analysis.

With this general background about neo-classical economics, we can pass on to a discussion of Marshall's ideas on welfare. In Marshall's writings is found a fusion of various trends of thought. He was too practical an economist to be preoccupied with a strictly static analysis. He dealt with factors which for many continental economists were data given by exogenous forces. Marshall's views on the progressive nature of man led him not only beyond the classical material level of analysis, but also beyond the purely subjective level based on the assumption of given wants.

Coming to Marshall's specific views on welfare, it should be noted that he developed the concept of surplus. He regarded surpluses as "the benefit which the individual derives from his opportunities or from his environment; or to resort to a word that was in common use a few generations ago, from his conjuncture."¹³ This definition is rather vague and as it stands, the surpluses would be in the nature of absolute magnitudes. Marshall, however, later used the term to

13. Marshall, A., PRINCIPLES OF ECONOMICS, p. 125.

mean the opportunity to buy a particular commodity at a given price. On the basis of this definition, it is possible to analyse the loss or gain experienced by the individual due to a movement from one price quantity situation to another. There are ample indications that Marshall tried to analyse the concept of aggregate surplus, the excess of the sum of satisfactions over the sum of dissatisfactions which accrue to the community from economic causes. But he did not think it practically possible to arrive at an estimate of aggregate surplus and had recourse to the idea of partial surplus. The partial surplus analysis does not relate to the economic welfare of the community as a whole in a given situation; it is concerned with net changes in economic well being due to given changes in particular sectors of the economic system, the rest of the system being assumed constant.

Marshall defined consumer's surplus as "the excess of the price which he would be willing to pay rather than go without the thing over that what he actually does pay."¹⁴ Consumers' surplus is measured on the assumption that marginal utility of money is constant. The device of consumers' surplus is used by Marshall to analyse the effects of tax or bounty imposed on a commodity. In the case of an industry obeying the law of constant returns, he proposed non interference, because in the case of a tax the loss of consumers' surplus and in the case of a bounty, the gain in consumers' surplus would be less than the amount received as tax or spent on subsidy. By similar reasoning, Marshall showed that imposition of tax on industries

14. IBID.

obeying the law of diminishing returns and subsidising those obeying the law of increasing returns would increase welfare.

The obvious defect in this line of reasoning is that Marshall ignored the factor of producers' surplus. He, however, was aware of the existence of producers' surplus.

To sum up, classical welfare analysis was mainly based on a physical level of analysis, with consequent emphasis on increasing physical productivity. Pareto and Barone developed the concept of subjective optimum based on the problem of rational allocation of a given quantity of resources. This analysis was considerably influenced by the marginal revolution. Neo-classicists steered a middle way while accepting the doctrine of marginal utility, they had a practical approach characteristic of the classicists.

Professor Pigou was one of the neo-classical economists. It will be clear, as we proceed with a discussion, of his welfare economics, that he was influenced both by English classicists and continental economists. Without being methodologically rigorous and faithful to English tradition, he arrived at the conditions of the general optimum.

CHAPTER IIPIGOU'S CONCEPT OF WELFARE

(I)

The central theme of this chapter is Pigou's approach to the problem of measurement of welfare. Starting from a subjective definition of welfare as states of consciousness, Pigou arrives through a chain of reasoning to the objective concept of national dividend. Successive generalisations involving the relationship between general welfare and economic welfare, desires and satisfactions are made in course of this analysis. Thus a change in economic welfare is assumed to influence in the same direction general welfare. Link is established between economic welfare and national dividend through the media of satisfactions, desires, and money demand. Pigou is conscious that his generalizations are not based on any logically rigorous proof; he uses them as convenient practical approximations.

The concept of economic welfare is to Pigou of immense practical importance. While economists like Pareto and Barone and more recently J. R. Hicks, Oscar Lange, A.P. Lerner and others approach the subject without going into a discussion of the controversial notion of ethical value judgments and formulate their welfare propositions in a more or less ethically neutral form, Professor Pigou expresses the opinion that the main motive of economic study is to help social improvement.

Pigou distinguishes between two kinds of studies, light-bearing and fruit-bearing; the object of one is knowledge for its own sake,

and the object of the other is knowledge for the sake of good things to which it leads. At one end of the scale, he says, is the most general science of all, metaphysics, the science of reality, which is principally light-bearing. On the other hand, the fruit-bearing aspect is more prominent in the science of biology, human physiology and specially the social sciences which deal with groups of men. Pigou emphasizes the practical usefulness of the study of economics.

"When we elect to watch the play of human motives that are ordinary--that are sometimes mean and dismal and ignoble--our impulse is not the philosopher's impulse, knowledge for the sake of knowledge, but rather the physiologist's, knowledge for the helping that knowledge may help to bring."¹

From this, ~~however~~, we should not jump to the conclusion that Pigou considers economics to be an art, to enunciate precepts of government. He is clear about the scientific content of economics when he says, "It is a positive science of what is and tends to be, not a normative science of what ought to be."² The pragmatic importance of economic science, again, does not consist in confining its enquiry within the bounds of immediately relevant practical problems. Such a narrow approach is likely to hamper investigations that might ultimately bear fruit. What is meant is that economists should not put on the mantle of pure mathematicians whose function is to explore implications. On the other side are sciences, such as physics, chemistry, and biology which are concerned with actualities. Choice of essential form of economic science should be guided by the realistic type of experimental sciences. "We shall endeavour to

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1. Pigou, A. C., *ECONOMICS OF WELFARE*, 4th ed., Macmillan & co, Ltd.
 2. *IBID.* p 5. London, 1932 p. 3.

elucidate, not any generalised system of possible worlds but the actual world of men and women as they are found in experience to be."³

(II)

Before undertaking the analysis of the problem involved in the measurement of welfare, Pigou distinguishes between welfare in general and economic welfare. He lays down two propositions: First, "that the elements of welfare are states of consciousness, and perhaps their relations; secondly, that welfare can be brought under the category of greater and less."⁴ The field of economics, he says, is restricted to "that part of social welfare which can be brought directly or indirectly into relation with the measuring rod of money."⁵ This is designated as economic welfare. The question may be raised about the relationship between economic welfare and welfare as a whole. Pigou observes that economic welfare will not serve for a barometer or index of total welfare. On the other hand, other components of welfare remaining the same, an increase or decrease in economic welfare will correspondingly raise or lower welfare as a whole. This is, however, based on the assumption that there is no correlation between economic and non-economic components of welfare, which might not be true. Thus Pigou considers the development of character and emotionally balanced individuals on the one hand and of skilled personnel on the other. The first is welfare of a

3. IBID.

4. IBID., p. 10.

5. IBID., p. 11.

strictly non-economic sort while the latter is economic to the extent that it leads to an increased production of goods and services. Pigou observes that concentration of efforts upon economic welfare embodied in the second may result in an unconscious sacrifice of non-economic welfare embodied in the first. He states two principal cases in which economic causes may react on non-economic welfare. First, mode of earning income will leave its impact upon non-economic welfare. Thus it is an interesting intellectual exercise to analyse the comparative effects of the cottage system and the factory system ushered by industrial revolution on economic and non-economic welfare. Secondly, the manner in which income is spent will affect non-economic welfare. Some acts of consumption have a debasing and some other an elevating effect, though they may yield equal satisfaction. Distinction may be drawn between the satisfaction produced by literature, art, public museums, etc., and that produced by alcoholic drinks. The first is definitely superior from the point of view of total welfare.

Thus there can be no rigid inference from economic to total welfare. On broad considerations, Pigou formulates a proposition which may be considered as his first approximation to welfare. The effect of an economic cause on total welfare is probably equivalent in direction though not in magnitude, to the effect on economic welfare, unless there is any specific evidence to the contrary. If the proposition is valid, economic science is likely to furnish a powerful guide to practice. Since the effects of economic causes are likely to be, to some extent, dependent on non-economic circumstances, an additional assumption is made. "Causal proposition in economics can

only be laid down subject to the condition that things outside the economic sphere either remain constant or, at least, do not vary beyond certain defined limits."⁶

(III)

To explain the nature of economic welfare, Pigou discusses desires and satisfactions. Economic welfare is defined broadly to consist "in that group of satisfactions and dissatisfactions which can be brought into relation with a money measure."⁷ But money payments are not directly associated with satisfaction, but indirectly through the medium of desires and aversions. Pigou argues that there is not necessarily a positive correlation between intensity of desire (which is measured by price) or utility and satisfaction. For the most part, however, this circumstance is thought to be of minor importance. A second proposition about welfare can, then, be formulated in terms of desires and satisfactions.

"The ratio between the intensities of desire that an individual feels for a pair of goods is approximately equal to the ratio between the amounts of satisfaction which their possession will yield to him."⁸

Pigou considers this true of a large segment of economic behavior and he cites only one important exception. "People distribute their resources between the present, the near future and the remote future on the basis of a wholly irrational preference."⁹ Present pleasures or satisfactions of given magnitude are preferred to future

6. IBID. p. 21.

7. IBID. p. 23.

8. IBID.

9. IBID. p. 24.

satisfactions of equal magnitude, leading to a distortion in the distribution of resources. Pigou suggests that some differentiation in favor of saving leading to the creation of capital, would increase welfare.

(IV)

Pigou's attempt to find out some category which can serve as a quantitative measure of welfare leads him to the discussion of national dividend. The two concepts of national dividend and economic welfare he regards as co-ordinate. The causal nexus is roughly as follows:

(1) increase in national dividend involves the fulfillment of an increase in aggregate desire, (2) an increase in satisfaction from economic causes results in an enhancement of economic welfare, (3) an increase in fulfilled desire leads to increased satisfaction, (4) increased economic welfare will serve as an approximate index of increase in welfare as a whole. We have dealt with the last three stages in the preceding sections and the meaning of the first step as expressed here may now be elaborated.

Pigou defines national dividend as "that part of the objective income of the community including, of course, income derived from abroad, which can be measured in money."¹⁰ He says that some arbitrariness is introduced in defining the concept with respect to the money measure. Strictly logically speaking, national dividend should include the whole annual flow of goods and services. But difficulties

10. IBID, p. 31.

are insuperable in measuring such a national dividend. Pigou, therefore, takes a position of compromise: first, national dividend includes all goods and services which come under exchange and also the services that a man obtains from a house owned and inhabited by himself, and secondly, the standard definition stated above should not be rigidly interpreted; it is modifiable to take account of other factors when conditions demand it.

There are certain implications in the above definition of national dividend. First, value of both final goods and intermediate products should not be included under national dividend. That would involve double counting, because value of final goods takes account of the value of intermediate products. Gifts against which no service is rendered must be excluded. Incomes in the form of old age pensions and special war pensions, interest on war loans, income obtained by force or fraud, Pigou observes, should not come under national dividend. Treasury receipts of income tax and death duties are not to be counted, as they are reckoned as such in private hands. On the other hand, if incomes are counted only after some taxes are paid, depending upon the fiscal system of the country, those taxes should be included under national dividend. The essential principle is that double counting must be avoided. Finally, Pigou observes, customs and excise duties ought to be counted because of their effect on prices. They raise prices and unless aggregate money income is also inflated proportionately, aggregate money income divided by prices would not give a true picture of the real income of the country.

The most controversial element in the measurement of national

dividend is net capital formation. Since national dividend is the sum total of goods and services produced in a particular period, we have to deduct the loss undergone during the process of production by the capital equipment inherited from past periods. This loss inherent in the productive process includes wear and tear due to use, weathering by lapse of time, and other insuperable risks and excludes destruction by "act of God or the king's enemies". Pigou concludes that "the maintenance of capital intact requires that all ordinary physical deteriorations in the capital stock should be made good."¹¹ The second important point is that replacement may not necessarily be of the particular type of capital which has been used up. The loss incurred is measureable in terms of money and maintenance implies the replacement of value losses--not of all value losses--but replacement of such value losses as are caused by physical losses described above.

After national dividend has been defined, a discussion of the relation between national dividend and economic welfare seems to be in order. Pigou adopts the Marshallian definition of national dividend as the aggregate of goods and services produced during a period minus "the decay and demolition that the stock of capital undergoes." Professor Irving Fisher, on the other hand, identifies national dividend with those goods and services, and those only that come into the hands of ultimate consumers. Fisher's definition, says Pigou, is useful only when we are interested in the comparative amounts of economic welfare of a community obtaining over a long series of years. But the

11. IBID, p. 46.

question he considers germane to his enquiry is the effect on economic welfare as a whole produced by economic causes acting on economic circumstances. As newly produced capital equipment embodies total consumption and total satisfaction, though they may be spread over a number of years, it should be counted as a part of the current national dividend.

The next problem taken up by Pigou is the measurement of changes in the size of national dividend as an index of changes in economic welfare. First of all, it is postulated that the size of the group whose welfare is under study is constant. Measurement of national dividend by means of a physical reference is impossible when the production of some goods is increasing and of some decreasing. We must have recourse to money which serves as a common denominator. Provided tastes and distribution of purchasing power among consumers do not change, dividend in period II is greater than in period I if the monetary demand for items added to the dividend of the second period exceeds the same for items subtracted from the dividend of the first period. When tastes and distribution of purchasing power change, a situation which is closer to reality, the welfare propositions stated above is valid only in a relative context; it can be formulated in terms of either period I or period II taste and distribution of purchasing power. Pigou's third approximation to economic welfare may then, be stated as follows:

"From the point of view of period I, an increase in the size of the dividend is a change in its content such that if tastes in period II were the same as those prevailing in period I and if the distribution of purchasing power were also the same as prevailed in period I, the

group would be willing to give more money to conserve the items added in period II than they would be willing to give to conserve the items that are taken away in period II.....From the point of view of period II an increase in the dividend is defined in exactly analogous ways. From an absolute point of view an increase in the size of the dividend is a change which constitutes an increase from both the above two points of view. When, of two dividends, one is larger from point of view of one period and the other from that of the other, the two are, from an absolute point of view, incommensurable."¹²

Reality does not allow what theory demands. Aggregate money demand for the things contained in the dividend of any period is an unworkable conception. It involves the addition of consumers' surpluses derived from each commodity. But only quantities and prices of various sorts of commodities are available in practice. Again, those quantities and prices correspond to the tastes and distribution of purchasing power of the different periods under consideration and we have no means of knowing what price structure would have been obtained if tastes and distribution were constant. Hence, the utmost we can hope for is a measure which will be independent of the actual taste and distribution of purchasing power during the periods under review, but which will be valid provided they are constant.

Let C_1 and C_2 represent the national dividend (in physical sense and not in monetary sense) and I_1 and I_2 money income in period I and period II respectively. Let X_i^1 and X_i^2 stand for amounts and p_i^1 and p_i^2 for prices, the subscript i ($i=1,2,3,\dots,n$) denoting n commodities and subscripts 1 and 2 referring to period I and period II respectively.

12. IBID, p. 54.

Generally $X_1^1 \neq X_1^2$ and $p_1^1 \neq p_1^2$. Then, if purchases were arranged in both the periods in the form C_1 represented by C_{11} and C_{12} , where the second subscript refer to periods, we have,

$$\frac{C_{12}}{C_{11}} = \frac{I_2}{I_1} \frac{\sum_{i=1}^n X_i^1 p_i^1}{\sum_{i=1}^n X_i^1 p_i^2}$$

and if purchases were arranged in both periods in the form C_2 denoted by C_{21} and C_{22} , we get

$$\frac{C_{22}}{C_{21}} = \frac{I_2}{I_1} \frac{\sum_{i=1}^n X_i^2 p_i^1}{\sum_{i=1}^n X_i^2 p_i^2}$$

The following conclusions may be drawn:

- (1) If both $C_{12} / C_{11} > 1$ and $C_{22} / C_{21} > 1$, an increase in national dividend and hence economic welfare is indicated.
- (2) If both $C_{12} / C_{11} < 1$ and $C_{22} / C_{21} < 1$, a decrease in national dividend and economic welfare is indicated.
- (3) If $C_{12} / C_{11} > 1$ and $C_{22} / C_{21} < 1$, or vice-versa, increase or decrease in national dividend is true only in a relative sense, and no conclusion can be made in absolute terms.

In the two algebraic expressions written above, $I_1 = \sum_{i=1}^n X_i^1 p_i^1$ and $I_2 = \sum_{i=1}^n X_i^2 p_i^2$ so that they can as well be written in the form

$$\frac{C_{12}}{C_{11}} = \frac{I_2}{\sum_{i=1}^n X_i^1 p_i^2}$$

and

$$\frac{C_{22}}{C_{21}} = \frac{\sum_{i=1}^n X_i^2 p_i^1}{I_1}.$$

In actual practice, quantities and prices of all commodities produced during different periods are not available and hence the measurement of changes in national dividend as suggested by the second form is impossible. The expression $\sum_{i=1}^n X_i^1 p_i^1 / \sum_{i=1}^n X_i^1 p_i^2$ and $\sum_{i=1}^n X_i^2 p_i^1 / \sum_{i=1}^n X_i^2 p_i^2$ as

obtained from the first form can, on the one hand, be approximated through the construction of index number based upon a representative sample of quantities and prices.

(V)

We may review, at this stage, some of the important ideas involved in Pigou's concept of welfare. His main generalizations, as set forth above, can conveniently be summarized as follows:

- (1) Economics is a science of welfare; in other words, the main motive of economic study is to help social improvement.
- (2) Change in economic welfare will probably indicate change in the same direction of welfare as a whole.
- (3) Price ratios which measure the ratio between intensities of desire can be regarded as a rough approximation to the ratio between satisfactions yielded by different commodities.
- (4) Change in national dividend, as defined, serves the purpose of an index of change in economic welfare.

It seems there are two trends of thought in Pigou's definition of economics as a science of welfare. In one sense, it is concerned with generalizations about and as such an explanation of economic behavior that we experience. This is precisely what Pigou means when he compares economics to the other experimental sciences. He discusses the limitations in generalising about economic behavior. First, "the relations which have to be determined are extremely numerous."¹³ Whereas in

13. IBID, p. 8.

physics or chemistry a few laws cover a significant range of their respective fields, the number of laws is too many in economics. Secondly, experimental method is not feasible in economics, simply because its subject matter is living and free men. Thirdly, time is an important factor in economic behavior in so far as the constants undergo change through time. On the other hand, the laws of physics or chemistry are not influenced by time. The whole trend of this discussion suggests that economics is supposed to perform, though imperfectly (in so far as its laws cannot be put in strictly precise quantitative form) the task which experimental sciences perform.

The other sense which is more relevant to his welfare ideas is evident when Pigou considers the study of economics as leading to social improvements. To serve this purpose, more than an explanation of prevailing economic behavior seems to be necessary. Unacceptance of some of the human motivations from the standpoint of welfare and substitution of some meaningful goals in their place and their impact on other variables of the economic system become the subject matter of study. Pigou's emphasis on the importance of ends is clear when he says,

"It is not wonder, but rather the social enthusiasm which revolts from the sordidness of mean streets and joylessness of withered leaves, that is the beginning of economic science."¹⁴

The economist here emerges in the role of a reformer.

In what sense, if any, can economics be regarded as a science of welfare? "Economics," according to Lionel Robbins, "is concerned with that aspect of behaviour which arises from the scarcity of means

14. Pigou, OP.CIT., p. 5.

to given ends; that in so far as the achievement of any end is dependent on scarce means, it is germane to the preoccupations of the economist."¹⁵

As regards the question whether economists should pronounce upon the validity of ends, Robbins observes,

"It does not seem logically possible to associate the two studies in any form but mere juxtaposition. Economics deals with ascertainable facts, ethics with valuations and obligations. The two fields of enquiry are not in the same plane of discourse."¹⁶

Robbins is perfectly valid in distinguishing between positive economics and welfare economics on the ground that "There is no logical connection between the two types of generalizations."¹⁷ Pigou seems to have inherited from his predecessors the notion of economics as a science of welfare. In so far as we restrict under the term welfare particular value judgments about which no generalizations can be made in the scientific sense, we necessarily narrow the field of economics. Evidently, different systems can be built up on the basis of different value judgments and both come under the purview of economics. Again many of the ends and human motivations may not have any usually accepted welfare connotations, but that does not preclude them from their being considered in an economic study so long as the essential criterion of scarce means is satisfied.

Economics, then, is not a science of welfare unless the term welfare covers the whole universe of ends. This, however, does not

15. Robbins, L., AN ESSAY OF THE NATURE AND SIGNIFICANCE OF ECONOMIC SCIENCE, p. 124.

16. IBID., p. 148.

17. IBID.

imply that welfare economics is unscientific; it is normative and is, therefore, a branch of ethics. This idea is based on an extremely narrow view of the nature of science.

"It is a legitimate exercise of economic analysis to examine the consequences of various value judgments, whether or not they are shared by the theorist, just as the study of comparative ethics is itself like any other branch of anthropology.....It is only fair to point out, however, that the theorem enunciated under the heading of welfare economics are not meaningful propositions or hypothesis in the technical sense. For they represent the deductive implications of assumptions which are not themselves meaningful hypotheses about reality."¹⁸

Welfare was intimately associated with positive economics in the minds of classicists. Much of modern welfare economics "merely makes explicit the criteria which were implicit in the works of classical economists.....

In making these criteria explicit, many vulgar and dogmatic prejudices, masquerading as the truths of economics have been exposed; and the consequent re-analysis have placed the findings of the science on a much sounder basis. Old dogmas of economic policy, presumably true for all times and places, have been shown to be valid only under certain circumstances."¹⁹

Pigou's discussion of the relationship between total welfare and economic welfare leaves a considerable room for doubt and controversy. Evidently no scientific generalization claiming universal acceptance can be made and the universe of discourse here is not strictly speaking economics, but largely ethics. Pigou admits the

18. Samuelson, P. A., FOUNDATIONS OF ECONOMIC ANALYSIS, Cambridge, p. 221.

19. Reder, M., STUDIES IN WELFARE ECONOMICS, New York, Columbia University Press, p. 13.

dogmatic nature of his fundamental propositions about welfare and they can be regarded as no more than convenient working hypothesis, the validity of which cannot be tested by scientific methods. Similar comments are applicable to Pigou's analysis of desires and satisfactions. The field of discussion allows a good deal of difference of opinion. The concepts of desires and satisfactions are somewhat vague, not amenable to quantitative study and the use of those terms as categories having a scientific connotation is highly dubious. Of course, an economist is perfectly free to express his own views on welfare and subjective satisfaction. Any scientific enquirer, however, should take account of the fact that when he proceeds from certain assumptions which cannot be proved to be true, he must make allowance for other assumptions and his system cannot be claimed to have an absolute validity. Pigou observes that there might be cases of divergence between desires and satisfactions but on the whole there is a good deal of correspondence. But this is only a compromise proceeding from an individualistic bias. One inclined towards socialism and using the same categories of desires and satisfactions may hold just the opposite view, namely, that in a large sector of free economy, desires and satisfactions are antithetical and state should intervene to bring about a correspondence between the two. Thus when Pigou generalises about the relation between desires and satisfactions, he does not really supply any meaningful proposition which can be tested for its validity. Where subjective valuation creeps in, it creates field for disagreement of a kind which does not hold for a scientific proposition.

Pigou's view about maldistribution of resources as a result of

our defective telescopic faculty is not based on sound reasoning. We can compare present satisfaction only with the present estimate of future satisfaction. To say that satisfaction derived from a particular good is the same in the future as in the present is to assert that satisfaction is something which pertains to the thing itself. A priori, this seems to be an illogical approach, as satisfaction can be defined only when the subject is considered together with the object.

In spite of his attempt at a subjective interpretation of welfare economics, Pigou's bias in favor of a physical level of analysis is evident. While he has been careful enough in stating the relation between general welfare and economic welfare, desires and satisfactions, his subsequent analysis reveals a lack of awareness about the subjective import of national dividend. Several reasons may be adduced in support of this view:

First, in his conception of national dividend, "all contractions in the money value of any parts of the capital stock that remain physically unaltered are irrelevant," and "their occurrence is perfectly compatible with the maintenance of capital intact."²⁰ When we deal with welfare in the subjective sense (rather than regarding it as proportional to the quantity of physical goods) the value of the capital should be derived from the expected value of income it will yield; the concept of capital intact merely by making good the physical wear and tear of capital goods becomes quite inadequate.

20. Pigou, *OP.CIT.*, p. 45.

Secondly, physical bias is introduced in using the classical net product definition of national dividend as an index of economic welfare.²¹ It seems that Professor Fisher's definition of national dividend which includes only current consumption has more relevance as a measure of economic welfare. "It is only consumption which contributes directly to current welfare--the contribution made by saving is at least of doubtful comparability."²² Hicks has shown that the national dividend as a measure of productivity is a different thing from the national dividend as a measure of the subjective economic welfare, except under perfect competition where prices are equal to marginal costs. In the evaluation of economic welfare, prices are used as the indices of marginal utilities, while in the calculation of productivity, they are used as the indices of marginal costs. So far as the measurement of productivity is concerned, consumption and investment goods are all on a par. Thus, Pigou's national dividend is an approximation of national productivity rather than economic welfare. Another important point may be noted in this connection. Pigou includes customs and excise duties in the calculation of national dividend, but he does not seem to have recognised that this procedure has a particular significance in the context of welfare. National income at market prices which is an index of economic welfare (to be precise, investment will have to be excluded) includes indirect

21. It should be noted, however, in all fairness to Pigou that practical considerations are heavily weighted in favor of his decision to include capital goods under national dividend. Most of the economists agree on this point on strong grounds connected with the problem of statistical measurement of national dividend.

22. Hicks, J.R., THE VALUATION OF SOCIAL INCOME, Economica, 1940

taxes and excludes subsidies. Reverse is the case with national income at factor cost which is a measure of productivity and, therefore, includes those factors which enter into marginal cost.

Finally, Professor Pigou's remarks about individual's irrational premium on present satisfactions and discount of future satisfactions are, as we have noted above, indefensible except against the background of a physical level of analysis.

While there is a substratum of classical physical level of analysis in Pigou's treatment of economic welfare, this should not be exaggerated. Pigou is impelled by the very nature of the subject to lay stress on the practical bearing of his conclusions rather than on their logical foundations. The objective measurement of subjective welfare is impossible in the first place, and the question is really one of approximation anyway. Pigou makes this explicit in course of his discussion on national dividend. According to his line of reasoning, the maximization of economic welfare in a given period involves definite relationships not only between consumption good but also between consumption goods on the one hand and investment goods on the other, produced in that period. On the basis of such an approach, income can be defined to include present values of future goods and services (incomes) just as these "intermediate" goods can be excluded on other grounds.

CHAPTER IIIPIGOU'S WELFARE PROPOSITIONS

(I)

In this chapter Pigou's welfare propositions will be presented and in the next chapter some of the important problems raised by Pigou's analysis of ideal output will be elaborated and examined.

Pigou offers two basic propositions on the maximisation of economic welfare. First, value of the marginal social net products of resources must be equal in all uses. Secondly, income must be equally distributed among the members of the community whose welfare is under consideration. These propositions are not, however, without limitations. There are practical considerations which act as constraints on the general propositions.

The discussion of welfare propositions is based on the assumption of full employment of resources. The concepts Pigou uses for his formulation of principles of welfare are basically two, the value of marginal private and the value of marginal social net product. When he deals with industries specifically, he defines three additional categories--equilibrium firm, supply price from the standpoint of the community and supply price from the standpoint of the industry. To begin with, it is convenient to explain the meaning of these basic concepts.

(1) Marginal private and marginal social net products: Marginal private net product is defined as the addition to marginal increment of resources in any given use or place, accruing to the person res-

possible for the investment of resources. Marginal social net product, on the other hand, is the aggregate net product from a marginal increment of resources. "no matter to whom any part of this product may accrue."¹

it is important to note in this connection what Pigou precisely means by the marginal increment of resources. It does not refer to the difference between the products of two adjacent quantities of resources.

"The marginal net product of any flow of resources employed in any use or place is equal to the difference between the aggregate flow of product for which that flow of resources, when appropriately organised is responsible and the aggregate flow of product for which a flow of resources differing from that flow by a small increment, when appropriately organised would be responsible."²

The marginal unit, again, is not any particular unit; it is any (small) unit out of the aggregate of units; all exactly alike conceived as placed at the margin.

(2) Supply price from the standpoint of the industry and supply price from the standpoint of the community: Supply price from the standpoint of the industry or supply price simpliciter, as Pigou calls it, is a function of technology and price of the factors used in production. Supply price from the standpoint of the community, on the other hand, is a function of technology only. Supply price from the standpoint of the community should reveal only the technical obstacles confronted during production; change in factor prices is excluded on the ground that it constitutes only a transfer of income. Thus if there is an increase in factor prices, supply price from the standpoint of the industry will rise whereas supply price from the standpoint of the

1. Pigou, A. C., *ECONOMICS OF WELFARE*, 4th Ed., London, 1932, p. 134.
2. *IBID.* p. 132.

community will remain constant because "from the point of view of community as a whole, no extra expense per unit of output is incurred."³

(3) Equilibrium firm: The definition of equilibrium firm is based on the biological notion of natural expansion, contraction, birth and decay of firms. Pigou accepts Marshall's conception that firms are like trees in a forest. When demand and supply conditions are constant, industry will be in equilibrium in the sense that output produced by the industry as a whole will remain constant. But that does not imply that the firms themselves will be in equilibrium. Some of the firms may be expanding, some contracting but these tendencies to expand and to contract cancel one another so that output of the industry as a whole does not undergo any change. How to analyse the equilibrium of the industry in terms of the equilibrium of the individual firm when the latter may be under the impact of dynamic changes? Pigou finds a way out of this tangle by means of his analytical concept of equilibrium firm. He observes that when the output of an industry as a whole is adjusted to the state of demand, expansion and contraction of firms are offsetting and under these circumstances, the notion of equilibrium firm is justifiable.

"It implies that there can exist some one firm, which, whenever the industry as a whole is in equilibrium, in the sense that it is producing a regular output y in response to a normal supply price p , will itself also individually be in equilibrium with a regular output. The conditions of the industry are compatible with the existence of such a firm; and the implications about these conditions, which, whether it in fact exists or not, would hold good, if it did exist, must be valid."⁴

3. IBID, p. 218.

4. IBID, p. 790 ff.

(II)

Now that the necessary concepts have been defined, we can proceed to an analysis of Pigou's basic welfare propositions. National dividend and hence, economic welfare is maximised when the value of marginal social net product of resources is equal in all uses, provided there are no costs of movement. The validity of this proposition rests on the assumption of the principle of diminishing returns. When there is a divergence in the values of marginal social net product of any factor unit in any two uses, national dividend will rise if there is a transference of the factor from the use where its marginal product is lower to one where it is higher. Determinate equilibrium will ensue as a result of increased application of any factor to those uses where its marginal product is high and its withdrawal from those uses where its marginal product is low. This will tend to narrow the gap between marginal product of the factor in different uses and in equilibrium the value of marginal social net products will be equalised throughout the economy, leaving no scope for further improvement.

That equalisation of marginal social net product of resources in all uses will maximise welfare is an allocational proposition, relative to a particular distribution of purchasing power or income. Pigou deals with the bearing of income distribution on economic welfare and comes to the conclusion that so long as the national dividend does not decrease, any increase within wide limits in the real income of the poorer classes at the expense of an equal decrease in that enjoyed by the richer classes is practically certain to involve an addition to

economic welfare. This proposition rigidly interpreted would imply the assumption that the marginal utility of money to different individuals is the same. Though Pigou does not explicitly state this assumption, he arrives at the same implicitly, reasoning on the basis of practical considerations. It is evident, he says, that any transfer of income from a relatively rich man to a relatively poor man of similar temperament will enable more intense wants to be satisfied at the expense of less intense wants and must increase the aggregate sum of satisfaction. It might be said that a rich man, from the nature of his upbringing and training is capable of obtaining considerable more satisfaction from a given income than a poor man would be. Pigou observes that in the long run, differences of temperament and taste between rich and poor are overcome by the very fact of transference of income. He also considers the bearing of interdependence of marginal utility of income on his distributional proposition. A large proportion of the satisfaction yielded by the incomes of the rich people comes from their relative position rather than from their absolute amount. If the incomes of all rich people are diminished together, the part of satisfaction which depends on others income will not suffer any appreciable diminution to offset increased satisfaction of the poorer group.

(III)

Thus, according to Pigou there are two fundamental welfare maximising propositions--one relating to allocation of resources and the other relating to distribution of income. The next problem that is raised concerns how far the activities of industries in a competitive

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economy conform to the principles of maximisation of welfare. This can be analysed in three parts:

- (1) Simple competition and welfare;
- (2) Simple monopoly and welfare; and
- (3) Discriminating monopoly and welfare.

We shall deal in this section with simple competition and welfare.

The allocational proposition, we have seen, can be broken up into two distinct issues, first, the equalisation of marginal private net products of resources in different uses and second, the equalisation of marginal private net product and marginal social net product of resources in each of their uses. In a competitive economy, self interest is a sufficient motive to bring about the equality in the values of marginal private net products. There is no necessity, however, in the nature of a competitive economy that marginal private net product and marginal social net product will be equal. whenever there is a divergence between these two sorts of marginal products, welfare is not at its maximum.

That marginal private net products are equalised as a result of competitive forces, is subject to qualifications. There are many hindrances standing in the way of supposed equality, which Pigou deals with at length. A potent obstacle to free movement of resources and hence to equality of marginal private net products comprises costs of movement and imperfection of knowledge. In so far as these factors are controllable, welfare can be increased by ensuring approximation to equality between marginal net products. Imperfect knowledge results partly from the character of business accounts and partly from the

general organisation of business finance. Rates of return obtainable on capital invested are not often made public by business firms. Again, since the rates of return are in many cases spread over a considerable period, "even correct knowledge of the immediate past gives but imperfect guidance."⁵ Secondly, the tendency toward equality between marginal private net products is inhibited by imperfect divisibility of the units in terms of which transactions are conducted. In modern times the size of the unit in which transactions in respect of capital take place has been diminished in a twofold manner, partly with the help of stock exchange and partly by arrangements which the great growth of securities adapted to serve as collateral has facilitated. The device of dividing shares into several grades and the holding of them in their riskiest early age by financiers, who afterwards pass them on, work in the same direction. Pigou concludes that in general, in present conditions, imperfect divisibility in the units of transactions has but little effect. Finally, it may be noted that hindrances to equality of returns also ensue as a result of relative variations in the demand for productive resources in different occupations and places.

Let us now pass on to the more important part of the deviation from optimum, the divergence between marginal private and marginal social net products. The source of this divergence lies in the fact that in some occupations under conditions of simple competition, "a part of the product of a unit of resources consists of something, which, instead of coming in the first instance to the person who invests the

5. IBID, p. 150.

unit, comes instead in the first instance (i.e. prior to sale, if sale takes place) as a positive or negative item, to other people."⁶ Pigou classifies these other people in three principal groups:

- (1) the owner of durable instruments of production;
- (2) persons who are not producers of the commodity in which the investor is investing; and
- (3) persons who are producers of this commodity.

The separation between tenancy and ownership of certain durable instruments of production often leads to, depending on the terms of contract between lessor and lessee, to divergences between marginal private and marginal social net products. Thus private net product of an assigned unit of investment will fall short of its social net product, if the tenant of durable goods had to return it to its owner at the end of the period of lease without reaping the full benefit of improvements made by him in the instrument. Similar case of divergence occurs when the plant of a concessionaire company passes ultimately without compensation into the hands of the town chartering it.

The essence of the second type of divergence is that transactions between a pair of persons affect third parties in the form of incidental services and disservices which are not generally neutralized by any scheme of compensation. Numerous examples may be cited. The benefits of a well-placed light house enjoyed by ships on which no toll can be levied, resources invested in private parks in cities, resources devoted to afforestation, to the prevention of smoke from factory

6. IBID., p. 174.

chimneys, to the fundamental problems of scientific research done are some of the cases where marginal social net product of resources invested is higher than their marginal private net product. On the other hand, building of a factory in a residential quarter destroying a great part of the amenities of the neighboring sites, resources devoted to the production and sale of intoxicants, work done by women in factories, particularly during the periods preceding and succeeding confinement are a few illustrations of marginal, social net product falling short of marginal private net product.

The third case of divergence concerns persons producing the same commodity and is closely associated with the nature of supply curves of the industries under consideration. As an expositional device, Pigou introduces the concept of an archetypal industry "in which the values of the marginal private and marginal social net products of investment are both equal to one another and also stand at a sort of central level representative of industries in general. As a result of the competitive process value of the marginal net product of resources in all industries will tend to conform to the central value. Therefore, there will be a deviation from maximum welfare when there is a divergence between the value of the marginal social net product and that of the marginal private net product of investment in any industry. In the archetypal industry, both marginal private net product and marginal social net product are equal and since marginal private net product of resources in all industries equals marginal private net product in the archetypal industry, maximisation of welfare involves the equality of marginal private net product and

marginal social net product in each individual industry.

welfare implications of equilibrium of industries under simple competition require a twofold analysis--the relation between the two types of supply curves (supply price simpliciter and supply price from the standpoint of the community) on the one hand and that between supply price and marginal social net product on the other. What is important on welfare grounds is supply price from the standpoint of the community.

Pigou analyses three possible types of supply price of an industry: (a) constant supply price, (b) increasing supply price and (c) decreasing supply price. It can be shown that in general, the rate of change from the standpoint of the industry in the supply price, as output increases is greater than or equal to the rate of change from the standpoint of the community in the supply price. Hence constant supply price simpliciter implies either a constant or falling supply price from the standpoint of the community. Decreasing supply price simpliciter also reflects decreasing supply price from the standpoint of the community. But increasing supply price simpliciter does not imply increasing supply price from the standpoint of the community. When the scale of an industry increases leading to improvements in technique and organisation, both supply price simpliciter and supply price from the standpoint of the community are lowered. Increasing supply price from the standpoint of the industry is generally the result of a rise of a factor prices (Pigou considers external diseconomies to be highly unlikely) induced by an increase in the scale of output. This does not involve any change in supply price from the standpoint of

the community. "In general," Pigou observes, "an industry whose purchases embrace only factors of production, cannot conform to the law of increasing supply price from the standpoint of the community."⁷ An exception to this general case is provided by the increase in prices of imported articles used by home industries. Since there is no offset against this price by way of transfer within the country, increasing supply price from the standpoint of the industry also brings about an increase in the supply price from the standpoint of the community.

Pigou translates supply price of the industry into marginal private and marginal social net products on the assumption that small changes in output of a given industry do not involve variations in the prices of any factor of production so that change in supply price is the inverse of change in marginal net product. It has been observed before that Pigou analyses the equilibrium of industry in terms of the concept of equilibrium firm. The supply price of an industry is equal to both marginal and average costs of the equilibrium firm. The marginal private net product of the equilibrium firm is equal to its average net product per unit cost and is thus the reciprocal of the supply price for the product. The marginal social product, on the other hand, is the reciprocal of the marginal supply price of the product to the industry. From this we come to the important proposition that the difference between the marginal private and marginal social net product of investment in any industry varies inversely as the difference between supply price and marginal supply price to the industry.

7. IBID., p. 220.

Now that we have stated the relationship between supply price simpliciter and supply price from the standpoint of the community and that between supply price and marginal net products, we can proceed to a discussion of the welfare implications of equilibrium of an industry. The equilibrium of an industry is given by the equation of its supply price with the demand price for its product. When supply price simpliciter is identical with supply price from the standpoint of the community (i.e., when there are no variations in factor prices) the value of marginal private net product of any unit of investment is greater than, equal to or less than the value of marginal social net product, according as the industry conforms to conditions of increasing, constant, or decreasing supply price from the standpoint of the industry. When there are changes in factor price, what can we say about the divergence between marginal private and marginal social net products simply by looking at the supply price simpliciter? We have already outlined the framework for such an approach. Since in general, increase in the scale of output of a commodity is not likely to lead to a fall in factor price, decreasing supply price simpliciter will reflect in all probability improved technology and organisation and will thus indicate decreasing supply price from the standpoint of the community. On the other hand, when supply price of an industry is rising, this is probably due to a rise in factor prices and therefore supply price from the standpoint of the community need not be increasing.

Several important conclusions may now be drawn:

- (1) At the point of equilibrium of a decreasing cost industry, marginal

supply price will be lower than supply price and marginal social net product of resources invested there will, then, be greater than their marginal private net product.

(2) At the point of equilibrium of an increasing cost industry, marginal supply price will be higher than the supply price from the standpoint of the industry, but not necessarily from the standpoint of the community. Therefore, conditions of increasing supply price do not imply that marginal private net product of investment in the industry exceeds marginal social net product; on the contrary, we may have the reverse case.

(3) At the point of equilibrium of a constant cost industry marginal supply price and supply price are equal and provided supply price simpliciter and supply price from the standpoint of the community are the same, marginal social and marginal private net products will be equal.

Now propositions concerning simple competition and welfare can be stated. Maximum welfare involves the production by all industries of a quantity of output at which marginal private and marginal social net product of investment are equal. These welfare maximising output and investment are termed ideal output and ideal investment respectively by Pigou. Under conditions of decreasing supply price, actual output is short of ideal output and maximisation of welfare implies an output exceeding that which is warranted by the free competitive process. Under conditions of increasing supply price, actual output may be more than, equal to, or less than ideal output with corresponding welfare connotations. Under conditions of constant supply price, actual output

will probably be equal to ideal output and welfare will be at a maximum.

(IV)

welfare implications of monopoly and discriminating monopoly are analysed by way of comparing them with simple competition. Pigou does not discuss the formal properties of monopoly itself and how they stand with respect to his basic welfare proposition. His monopoly is an exception to a system of simple competition. The deviation of monopoly output from ideal output is deduced by tracing the deviation of monopoly output from competitive output. For an effective comparison between monopoly and simple competition, the assumption is made that the economies and technique of production are the same under both.

Pigou does not express explicitly the condition of monopoly equilibrium. "When simple monopoly prevails," he says, "it is to the interest of the monopolist so to regulate his output as to make the excess of his aggregate receipts over his aggregate costs (including earnings of management and so forth) as large as possible."⁸ It follows from the properties of competitive equilibrium and monopoly equilibrium that monopoly output will always be less than competitive output. Hence, (1) in decreasing supply price industries, monopoly output will be less than competitive output which is less than ideal output. Thus the gap between ideal output and actual output is enhanced when monopoly takes the place of simple competition. (2) In industries with constant supply price, monopoly output will be less than competi-

8. IBID. p. 270.

tive output and thus less than ideal output. (3) In industries with increasing supply price from the standpoint of the community competitive output is more than ideal output. Monopoly output in this case, since it falls short of competitive output, might be closer to ideal output.

Let us consider now the effect of discriminating monopoly on welfare. Non-transferability of commodity or demand leads to successful discrimination. Pigou distinguishes between three kinds of discriminating power which a monopolist may conceivably wield.

(a) First degree or perfect discrimination is defined by the exaction of the full demand price for each unit by the monopolist, so that no consumer's surplus is left to the buyer.

(b) The second degree discrimination is characterised by the fixation of n separate prices of a commodity so that all units with a demand price greater than x were sold at a price x , all with a demand price less than x and greater than y at a price y and so on.

(c) The third degree discrimination would mean the classification of customers into different groups demarcated by some practical mark and setting up separate monopoly prices for the members of each group. Illustrations are provided by doctors charging different fees for their rich and poor clients, imposition of different freight rates depending on the nature of article for transport etc. This is the most realistic of the three kinds of discrimination.

Under perfect discrimination, it is always profitable for the monopolist to produce the ideal output (assuming that supply price simpliciter and supply price from the standpoint of the community are

equal). At the point of intersection of demand curve and marginal supply curve, monopolist's profits will be maximised. Finally, perfect discrimination "may bring about a considerable amount of socially desirable investment in an industry in which under a regime of simple competition, it would not have been to anybody's interest to make any investment at all."⁹

When supply price simpliciter and supply price from the standpoint of the community are not identical, output under perfect discrimination will be less than ideal output. Under conditions of decreasing supply price, output under discrimination will be nearer to ideal output than output under simple competition. In industries with increasing supply price, output under discrimination is less than competitive output. The divergence between ideal output on the one hand and output under perfect discrimination and simple competition on the other will depend on the location and shape of the supply curve from the standpoint of the community.

Discriminating monopoly of the second degree approaches perfect discrimination as the number of different prices increases. Output in this case is less than that under perfect discrimination, and therefore falls short of ideal output.

In case of discriminating monopoly of the third degree, there is a significant difference in the structure of markets in so far as the total demand at a certain price is not satisfied. Here "ideal output ceases to be a single output of the whole industry and becomes a number of separate outputs sold in separate markets."¹⁰ Pigou distinguishes

9. IBID., p. 283

10. IBID., p. 285

between three principal cases of this type of discrimination and attempts their evaluation by comparing them first, with conditions of simple monopoly and later with competitive conditions. First, if under simple monopoly the commodity under consideration would be consumed in, say, markets A and B, there is no reason to infer that output under discrimination will differ in the upward or downward direction from that under monopoly. If demand and supply curves are straight lines, output will be the same under simple monopoly and discriminating monopoly. Secondly, supposing that under simple monopoly, some of the commodity would have been consumed in A, but none in B, it is impossible that discrimination should lead to diminution of output; on the contrary, output will be higher depending on the strength of demand in B. Finally, if under monopoly there would be no consumption of the commodity in either A or B, discrimination would obviously be an improvement.

How does discriminating monopoly of the third degree stand with respect to simple competition? Under conditions of constant and increasing supply price, output under discrimination will be less than competitive output. If decreasing supply price prevails, Pigou observes, monopoly plus discrimination of the third degree may raise output above the competitive amount and is more likely to do this the more numerous are the markets between which discrimination can be made.

The following conclusions may be drawn regarding the extent to which output under discriminating monopoly of the third degree approximates ideal output. Generally speaking, the divergence between ideal output and output under this type of discrimination is likely to be less than that between ideal output and monopoly output; but as compared to

competitive output. output under discrimination is not likely to be nearer to ideal output. When the conditions are such that there is an ideal output (other than a zero output), simple competition yields no output and discriminating monopoly of the third degree yields some output, this output must be nearer to ideal output than no output under simple competition. Pigou makes an additional observation. Even when output under discriminating monopoly conforms more nearly to ideal output, it does not follow that it will involve greater equality between the values of marginal social net products over industry as a whole.

(V)

The nature of the divergences between marginal private net products due to various hindrances and between private and social net products has been considered above. In this section, Pigou's recommendations about economic policy to enhance welfare will be taken up. This can be analysed in two parts; first measures geared to mitigate the effect of hindrances to equality of marginal private net products and secondly, measures prescribed to narrow the gap between marginal private and marginal social net products.

Before proceeding with the discussion of policies designed to increase economic welfare, a few words in explanation of the theoretical issue involved, will be found helpful. The allocational proposition implies the equalisation of marginal social net products of resources in different uses; it does not, in any way, directly relate to private net products. Optimum allocation does not require the identity of private and social net products. If the magnitude of divergence between

the two types of net products in alternative uses of resources is the same, the optimum allocation exists and no interference is called for. Pigou's policy recommendations, however, are based on the tacit assumption that in the main body of industries, the values of marginal private and marginal social net products are equal and therefore the equalisation of marginal private and marginal social net products serves as criterion of policy, for the equality of social net products follows automatically.

The important factors hindering equality of marginal private net products are costs of movement, imperfect knowledge, and imperfect divisibility of units. It may be expected that reduction of costs of movement will narrow the gap between marginal returns and thus enhance economic welfare. But this statement is subject to qualifications. So long as knowledge is imperfect, shifting of resources in response to reduction of costs of movement is not necessarily a movement toward the optimum. On the other hand, reduction in the obstacles set up by ignorance affected without expense will always increase the national dividend, though it will not always do it by promoting equality among the values of marginal net products. It should be noted in this connection that reduction of obstacles to the movement of resources may sometimes modify the quantity of resources used and consequently national dividend. Pigou¹¹ considers it to be highly unlikely that a reduction in obstacles to movement will lead to a decrease in national dividend. Regarding the elimination of obstacles presented by imperfect

11. IBID., p. 145

knowledge. Pigou¹² advocates improvement in the matter of business publicity in which there is a lot of scope. He also believes that growing specialisation in the field of investment, demarcation of the field between moneyed people among the public on the one hand and professional financiers, company promoters, businessmen, etc. on the other, has been a step in the right direction so far as improvement of knowledge is concerned. Pigou¹³ suggests that banks can help directing resources into productive channels, by acting not only as promoting agents but also as an investigating body as the Raiffeisen banks in Germany. No specific suggestion is offered about mitigating hindrances due to imperfect divisibility of units. Pigou¹⁴ does not consider it as important under present conditions and facilities offered by the development of stock exchange.

For the equalisation of marginal private and marginal social net products a judicious employment of taxes and bounties is recommended. Divergences due to imperfect tenancy laws can be mitigated by a modification of the contractual relation between the parties involved. Divergences arising as a result of third party services or disservices may be sought to be remedied by a system of taxes and bounties. Some illustrations are provided by the beneficial effects to be expected from taxes on the sale of alcoholic drinks, levy of petrol duty on motor car licence tax upon the users of motorcars, the proceeds of which are devoted to the services of the roads etc. Pigou believes that apart from fiscal measures, direct governmental action may

12. IBID., p. 150.

13. IBID., p. 155.

14. IBID., Part II Chapter VII

sometimes be desirable. It is necessary

"that an authority of wider reach should tackle the collective problems of beauty, of air and of light, as those other collective problems of gas and water have been tackled."¹⁵

A system of taxes and bounties is also recommended to mitigate divergences due to varying slopes of supply curves. The excess or defect of marginal social product over marginal private product calls for bounty or tax to produce the optimum effect. From what has been said above, it follows that there is a presumption in favor of state bounties to industries with decreasing supply price. Imposition of taxes on industries with increasing supply price from the standpoint of the community but not necessarily on industries with increasing supply price (simpliciter) follows directly from the theoretical considerations set forth above.

Pigou discusses in this connection the bearing of state regulation of prices on welfare. We have seen that welfare is related through satisfactions and desires to demand prices which are conceptually different from any prices fixed by law. "The value of marginal net products of resources, which it is to the interest of the national dividend to make equal everywhere, consist in the marginal physical net products multiplied by the demand prices."¹⁶ Artificial reduction of prices in any sector of the economy does not lower the true value of the marginal net product and therefore, conditions existing before the imposition of any restriction remains unaltered. Any external limitations.

15. IBID., p. 195

16. IBID., p. 239

Pigou observes, imposed on the price of any article produced under competitive conditions must injure the national dividend. In circumstances of war, however, there are reasons which justify price regulation. The state takes over the task of allocating resources in many departments of industry during war and since a major portion of resources has to be devoted to the production of war materials, price control becomes inevitable. Regulations within limits, during war, Pigou concludes, is not injurious to national dividend.

Distortion of resources is much more under monopoly than under simple competition. Pigou¹⁷ considers in this connection the efficacy of purchaser's associations and public control of monopoly. The essence of a purchaser's association consists in directing its policies to maximise aggregate purchasers' benefit minus aggregate costs. This will make, if others except the purchasers of the commodity are not affected by its production, the value of the marginal social net product of resources devoted to it equal to the value of the marginal social net product of resources in general. But no inference can be hazarded as to the effect on national dividend or economic welfare, until the comparative advantages in respect of productive efficiency of purchasers' associations and ordinary commercial businesses have been ascertained. So far as management is concerned, purchasers' associations are likely to be inferior to private business; initiative for quick action and stimulus of personal possession will be lacking. On the other hand, purchasers' associations have advantages in production so

17. IBID., Part II, Chapter XIX

far as they save costs in competitive advertisement. They are exceptionally well-fitted to spread knowledge of the best methods of production among their members, and have exceptionally small need of bargaining and safeguard against fraud. Also loyalty of the members to co-operative concerns enable them to function steadily without the fluctuation to which ordinary business is subject; this advantage is likely to hold for purchasers' associations. In spite of these advantages, there are various reasons which restrict, to a great extent, the role of purchasers' associations.

Government intervention has been practicable under modern conditions and the pros and cons of public control of monopoly are discussed by Pigou.¹⁸ Under modern conditions of monopoly, he observes, fiscal devices cease to be effective and more direct intervention of the state becomes necessary. In the first place, the government may aim at preventing monopoly power from arising or if existent, at destroying it, where some monopolistic power comes through the development of combinations. There are, however, serious objections to this general policy of trust prohibition and trust breaking. First, the policy is extremely difficult to enforce and combinations may emerge under different forms. Secondly, among many industrial combinations dissolution will probably lead to a monopolistic than to simple competition. Thirdly, combinations are not unmixed evils; they yield incidental benefits in the form of certain economies of production. On the other hand, the introduction of collective responsibility and efficiency by

18. IBID., Part II, Chapter XXI

combinations may lead to relaxed energy and enterprise. Combination is likely, on the whole, Pigou concludes, to diminish output of the commodity affected by it and to raise its price, unless the associated economies are so large that, had they been introduced without monopolisation they would have raised output to about double its former amount. A second line of policy for the state would be to prevent the exercise of monopoly power by trusts or cartels by conserving potential rather than actual competition. This is worked by penalising the clubbing devices of cut-throat competition, or of destructive dumping or of boycott. Legislation to prevent clubbing devices, even if successful in its immediate object would not serve completely to maintain potential competition. More direct methods are called for. The policy of encouraging the formation of rival combinations against existing trusts or cartels is not likely to be effective. The public authority is in a position to restrict the anti-social practices of powerful corporations by sufficient publicity.

As many of the remedies dealt with above may prove inadequate, direct interference with the terms of sale may be necessary. Fixation of competitive price in an increasing cost industry is an imperfect measure; for if the price is to be fixed by the state at the level proper to competitive conditions, it will pay the monopolist to produce less than this output; output will be reduced to the level where monopoly gain is a maximum. Under conditions of constant or decreasing supply price, the monopolist will not find it profitable to reduce output below the competitive level; and therefore control over price

will serve its purpose. Control may be either negative--forbidding unreasonable prices or positive--establishing maximum prices. Whatever method of regulation is followed, some sort of sanction to make the law effective must be provided. Pigou¹⁹ examines at length the difficult problem of settling the basis in accordance with which the reasonableness of prices shall be determined, and methods designed to prevent or limit errors on the part of the price regulating authority, which we need not elaborate here. It is evident that Pigou is in favor of control of monopoly, though he is fully conscious that control is necessarily cumbersome and expensive.

Pigou does not advocate public operation of industries, apart from few special exceptions including monopoly. The public operation of industries may assume a number of different forms and from the view of technical efficiency it need not be inferior to private operation--particularly controlled private operation. But there are certain dangers in public operation. First, the state may resort to unfair extra commercial methods at the cost of rival enterprise capable of satisfying the same wants more cheaply. Secondly, under public operation, initiative for assuming risk and venture for experimentation are likely to suffer. Thirdly, the establishment of uneconomic units of management may jeopardise efficiency. Apart from these general considerations, however, there are some special fields of industries in which the state can profitably operate, and promote the cause of welfare; for instance, industries closely associated with the public health. There is a case for public operation of industries with large

19. IBID., p. 365 ff.

producing units tending towards monopoly.

"The case for it, as against the case for public control, is strongest in industries which have been reduced more or less to routine and in which there is comparatively little scope for daring adventure."²⁰

Pigou observes that even when a heavy price has to be paid to vested interests, it may still be for the general good that public authority should buy up a private monopoly, in order to stop artificial restriction of output.

Regarding the distributional proposition, Pigou²¹ advocates gradualness in the transference of income from the rich to the poor. There are two reasons. In the first place, an once-for-all transference in income may not lead to a sufficient increase in the satisfaction of the poorer group to offset a corresponding decrease in the satisfaction of the richer group. Secondly, distribution of income is related to productive efficiency. A sudden large transference is likely to hamper business enterprise and thus decrease the national dividend. Pigou prefers indirect measures in the form of subsidies to wages, lowering of the prices of goods and services consumed by the poor to direct redistribution of income. It is supposed that an indirect distribution of income will be much less harmful in affecting entrepreneurial efficiency.

(VI)

Several important conclusions can be derived from the above discussion of Pigou's welfare propositions. In the first place, instead

20. IBID., p. 405.

21. IBID., Part II, Chapter VIII, and Part IV, Chapter VIII.

of Marshall's surplus analysis Pigou uses the marginal apparatus to analyse problems of welfare. Both the allocational and distributional propositions are considered in the light of marginal analyses. Thus economic efficiency in the allocative sense requires the equalisation of the value of marginal social products of resources in different uses. Distributive optimum involves the equality of marginal utility of income derived by members of a community. Secondly, Pigou derives the conditions of optimum for the economic system as a whole, instead of for particular sectors of the economy. The surplus analyses is particularly suited to partial equilibrium approach, and it can better be used for partial welfare analysis rather than general welfare analysis. Pigou set out to derive general conditions of optimum which can best be tackled by the concept of the margin. Classicists and neo-classicists before Pigou considered welfare only partially and did not formulate any welfare proposition systematically. Pigou was the first neo-classicist to apply the powerful tool of marginalism to deduce conditions of maximum welfare. Thirdly, Pigou departs from the classicists' practice of treating free competition as a means to increasing productivity and dynamic economic progress. He proceeds from the assumption of a fixed quantity of resources and examines the role of free competition as a means to the allocation of resources. This is essentially a static problem which was also considered by Pareto, and Barone. Finally, Pigou first seriously considers the possible sources of disharmony between private good and social good in a laissez faire economy. Adam Smith was optimistic about the potentialities of free competition. Ricardo and Malthus considered the darker aspects in the light of

longrun dynamic considerations. According to Pigou, a competitive economy, even in a static framework, does not necessarily lead to the best allocation of resources. He points out the important type of divergence which is caused by third party services or disservices due to the application of resources in any particular use or place. Under modern industrial conditions, many of the social problems are the outcome of economic causes and the pricing mechanism does not take account of many social costs. This results in a divergence between private and social good and state intervention is necessary for the correction of these maladjustments.

Apart from these differences, however, Pigou's approach and views are in many respects neo-classical in nature. In the first place, Pigou uses the utility calculus. In regarding the size of marginal social product as the measure of the increase in subjective economic welfare, Pigou is obliged to assume two things: first, the marginal utility of money is the same for different individuals in the community, and secondly, prices of different commodities measures the absolute quantity of satisfaction obtained by their consumers so that value of marginal social product is also a measure of economic welfare. Pigou has been attacked by later economists for making interpersonal comparison of utility which is believed to be impossible. New welfare economics which is a development of the Paretian system has tried to avoid the stigma by abstracting from any consideration of the distributions of income. It will be shown in course of our discussion that Pigou's assumption on interpersonal utility is one among a number of value judgments which are necessary for welfare economics. The critics, which

avoiding intrapersonal comparison, have implicitly made other value judgments which cannot be scientifically proved for their validity. Secondly, Pigou's discussion of welfare propositions, specially of his policy recommendations is impregnated with a practical insight which is characteristic of Marshall and other classicists and neo-classicists. His concept of free competition is not derived from the logic of analysis as in the case of Pareto and Barone. It is the same as what classicists and neo-classicists believed to exist in practice. It has been noted above that even in cases of divergence between marginal private and social net products, Pigou's advocacy of state intervention is not unqualified. He considers the possible deterioration in efficiency which will injure the national dividend. He is in favor of the control of monopoly (in Pigou's treatment of the problem, monopolies are rather exceptions), though he believes that control is necessarily cumbersome and expensive. Apart from some special fields which are generally known as public utility industries, Pigou is against public operation of industries. All these considerations result from Pigou's belief in the essential soundness of free enterprise, which is a part of his classical heritage. The competitive system which Pigou considers is not a frictionless system; it coexists with various types of hindrances like costs of movement, imperfect knowledge, imperfect divisibility of factors and also a certain degree of monopoly. It seems evident that Pigou is not satisfied with the mere formulation of abstract propositions. He considers the innumerable constraints which are faced in practice and after a discussion of their pros and cons, he gives his decision. This practical interest is again revealed in his recommenda-

tions, about redistribution of income. Theoretically, he is in favor of an equiditarian distribution of income. But the nature of transference of income from the rich to the poor is to him extremely important. As a believer in the efficacy of free enterprise, he pleads such transferences as will not harm productive efficiency. Finally, Pigou follows Marshall in assuming the equilibrium of industries, though the individual firms may not be in equilibrium. The concepts of equilibrium firm and archetypal industry are rather confusing in Pigou's treatment of ideal output. His distinction between supply price simpliciter and supply price from the standpoint of the community also cannot be upheld on a subjective level of analysis. We shall proceed to an examination of Pigou's ideal output in the next chapter.

CHAPTER IV

PIGOU'S IDEAL OUTPUT

(I)

In this chapter, the assumptions on which Pigou's thesis of ideal output is based will be examined. It will be seen that the problem of ideal output in increasing cost industries was repeatedly revised by Pigou and he did not arrive at a satisfactory conclusion. That is due to an unsatisfactory treatment of the supply curve of industries. Under modern approach, the supply curve of an industry is derived from the cost curves of individual firms under competitive conditions. This has brought to light the generalised theory of rent, which extends beyond the Ricardian conception. Pigou's problem can be more satisfactorily solved when the concept of rent is taken into consideration. The object of this chapter is mainly to review Pigou's conclusions on ideal output under perfect competition and monopoly in the light of this theory of rent.

Pigou's welfare proposition on allocation of resources can be summed up in one simple sentence: national dividend and hence economic welfare will be maximum when the marginal social net products of resources in different uses are equal. On the assumption that in a large sector of the economy, marginal private net product and marginal social net product are equal due to the prevalence of free competition, the basic welfare proposition can be stated as follows. Economic welfare will be maximum when marginal social net product and marginal private net products in different uses are equal. A critical study of this proposition,

as applied to industries with different types of supply curves presupposes an examination of the validity of three principal concepts, namely, supply price simpliciter and supply price from the standpoint of the community, equilibrium firm and marginal private and marginal social net product.

It will be generally agreed that an unqualified distinction between supply price from the standpoint of the industry and supply price from the standpoint of the community is not valid on a subjective level of analysis. Supply price is a function of two variables, technology and factor price. If physical productivity of factors is our object of study, we are required to eliminate the effect of change in factor prices from supply function and thus reveal the operation of technical obstacles confronted during production. But change in factor prices acquires significance in a study of welfare; it expresses foregone utilities or opportunity cost. This will be analysed in more detail below.

Pigou's concept of equilibrium firm corresponds to Marshall's notion of representative firm. It envisages the equilibrium of an industry even when the constituent firms are not in equilibrium. Some firms are growing, some are decaying, leaving the total output of the industry unchanged. This concept has been the subject of attack from a group of economists, particularly L. Robbins.¹ Though many of these criticisms are unwarranted, following from a wrong understanding of the concept, it has not been accepted as an useful tool of analysis, even among Cambridge economists. According to static analysis, the equilibrium of an industry is the result of the equilibrium of its individual firms.

1. Robbins, L., REPRESENTATIVE FIRM, Economic Journal, 1928, Sept.

There cannot be any equilibrium of the industry unless the firms are in equilibrium. We are mainly concerned in a static analysis with the properties of equilibrium of individual firms (so far as the theory of value is concerned). On the other hand, a study of the dynamics of industry will involve a study of the processes resulting in a convergence to or divergence from equilibrium. The concept of equilibrium or representative firm does not logically belong to any of these two types of analysis, static or dynamic. It presupposes the equilibrium of the industry, though the firms are in a state of constant change. Both static and dynamic elements are incorporated in the concept, though it does not seem to belong to either of those spheres. Marshall has called this biological approach which he believes to be true not only for living beings, but also economic units. Whatever may be said in defence of this approach, it has not been properly developed, even in Marshall's and Pigou's writings.

Non-acceptance of the concepts of equilibrium firm and archetypal industry is not damaging to Pigou's welfare propositions. Under the mathematical static approach, equilibrium of the industry presupposes the equilibrium of individual firms. The properties which Pigou develops for his equilibrium firm should be applicable to all firms according to modern analysis. Thus Pigou observes that when the industry is in equilibrium, the average and marginal cost of the equilibrium firm will be the same as the supply price for the industry. This property is extended to all individual firms when the concept of equilibrium or representative firm is abandoned. Archetypal industry is a similar concept which Pigou employs to analyse deviations from

maximum welfare. He conceives the existence of some industry in which marginal private and marginal social net products are equal; the situation in all other industries is reviewed with reference to this central industry. Now as Kahn points out, Pigou's conclusions are hard to interpret unless by archetypal industry, he means the existence of a large number of industries where marginal private and marginal social net products are equal.

The marginal social product is a perfectly justifiable theoretical concept, but its evaluation is likely to be extremely difficult in practice. According to Pigou's definition, the value of the marginal social product is obtained by multiplying the main product and the incidental services and disservices rendered by their respective market prices. He does not incorporate any valuation made by society as a central organic unity in his concept. But Pigou does not answer the real problem involved in the evaluation of marginal social product. Carried to its logical conclusion, marginal social product flowing from the application of resources in a particular use or place will involve a large number of services or disservices which do not come under the ordinary market mechanism. This will be specially true of those types of services or disservices which are essentially of a psychic nature. In order to choose from this wide range which can conceivably be included under marginal social product, some value judgments seem to be absolutely necessary. It appears that Pigou would include only those services and disservices which can be brought under the measuring rod of money. But this expression is extremely elastic, specially when there is no market for the incidental benefits or losses.

For the determinateness of Pigovian optimum, it is necessary that the marginal social product curves have a negative slope, in the neighborhood of equilibrium. The law of non-proportional returns is not applicable here. When Pigou speaks of a marginal unit of investment, he is not thinking of a marginal unit of the variable factor, assuming the quantity of other factors to be constant.

"If the r th. increment of investment is to have a precise meaning," he observes, "it must be interpreted as the r th. (physical) increment of some one sort of productive resources (e.g., labor of a given quality) plus whatever additions to the quantities of the other sorts properly go with that increment. These quantities are perfectly definite, being determined by the condition that, in respect of any given quantity of output, the various factors of production must be combined in such wise as to make their aggregate money cost a minimum."²

The marginal social product of resources, as defined, need not be falling. Thus the falling marginal product curve in Pigou's sense must be derived ultimately from the principle of diminishing marginal utility of the product itself. Pigou does not explain how according to his definition marginal products of different increments of resources can be made comparable. For the r th unit of a particular factor combined properly with other factors will not usually be the same as the $(r + h)$ th. unit of the same factor (unless factor proportions are technically fixed). The different factor units (marginal) under Pigou's definition can be made comparable only if marginal investment are interpreted in the monetary sense. Pigou is not at all clear on this point.

(II)

Pigou's discussion of deviation from ideal output in the case of
 2. Pigou, *ECONOMICS OF WELFARE*, 4th Ed., p. 173.

increasing and decreasing cost industries is confusing, though his conclusions are substantially correct. He advocates throughout the discussion what has now become known as marginal cost pricing. But he arrives at these conclusions through a chain of reasoning which is difficult to digest. There are four functions on the supply side, supply price from the standpoint of the industry and marginal supply price from the standpoint of the industry; supply price and marginal supply price from the standpoint of the community. We have already noted our objection against the definition of supply price from the standpoint of the community. It does not sound reasonable to exclude from total costs increment in factor prices due to increasing opportunity cost. Mrs. Robinson's³ illuminating analysis on rent has been a step forward in the study of cost curves and Pigou's discussion of increasing and decreasing returns may be conveniently reviewed in the light of that study.

Pigou's ideas about supply curves and marginal social product in increasing and decreasing cost industries underwent considerable changes since he published his WEALTH AND WELFARE in 1912. Though we have restricted our study to his latest edition, it is interesting to note the evolution in his ideas in this particular case. In WEALTH AND WELFARE, Pigou⁴ drew two positively inclined supply curves S_1 and S_2 which he termed supply price and marginal supply price respectively and concluded that the intersection of S_1 with demand curve DD_1 gave

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3. Robinson, J., *ECONOMICS OF IMPERFECT COMPETITION*, MacMillian & Co., Ltd, London 1934, Book III, Chapter 8.
 4. Pigou, A.C., *WEALTH AND WELFARE*, MacMillian & Co., Ltd, London, 1912, pp. 172-79.

the competitive price and output, whereas ideal output was given by the intersection of S_2 with the demand curve. In a review, Allyn Young⁵ acclaimed Pigou's S_2 curve as a new and a powerful tool of economic analysis specially as applied to monopoly but denied that it proved a divergence of competitive from ideal output. In the first edition of *ECONOMICS OF WELFARE*, Pigou made some alterations in his argument influenced by Young's criticism. He observed, in support of Young's view, that "the excess of marginal supply price in industries of diminishing returns over the corresponding supply price is merely a nominal excess of money paid, and not a real excess represented by resources employed."⁶ He maintained that the competitive output, though not a deviation from ideal output in case of rising transfer cost, was so in the case of diminishing returns.

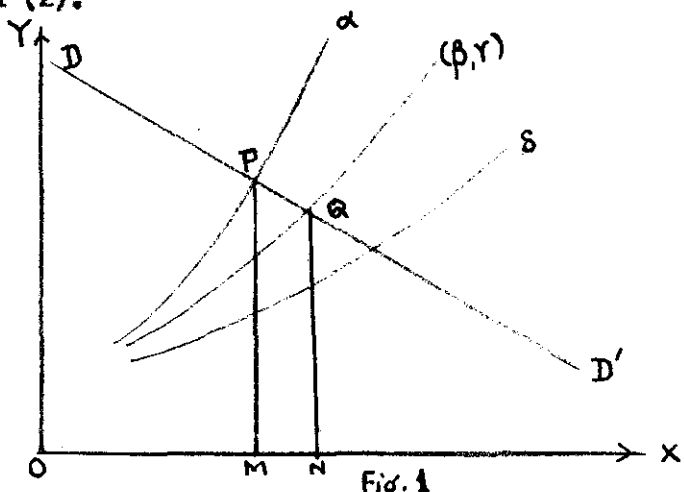
"The reason why diminishing returns in terms of money appear when they do appear is, in general, not that the money price of factors employed is increased, but that the proportionate combination of different factors, which it is most economical to employ when x units are being produced, and the extra cost involved in the first is real, not merely nominal. For these reasons, Young's objections, as a general reason fails."⁷

Pigou further revised his thesis in an article in the Economic Journal,⁸ admitting that his reply to Young was not adequate. In the second edition of *ECONOMICS OF WELFARE* a revised statement was given which was retained in later editions. The revision consisted, as we have seen,

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5. Young, A.A., *PIGOU'S WEALTH AND WELFARE*. Quarterly Journal of Economics, August 1913.
 6. Pigou, *ECONOMICS OF WELFARE*, 1st Ed., Macmillian & co., ltd. London, 1920, p. 935.
 7. *IBID.*, p. 936.
 8. Pigou, *COMMENT*, Economic Journal, March 1924.

in the abandonment of the general thesis that under increasing cost, competitive output under consideration exceeds the ideal, and the adoption of the very limited proposition that divergence is likely to occur when increase in factor cost accrues to foreigners as price for imports.

In retrospect, a better light can be thrown on the discussion, keeping in mind Mrs. Robinson's⁹ distinction between four cost curves which are marginal cost including rent (α), average cost including rent (β), marginal cost excluding rent (γ), and average cost excluding rent (δ). Supply curve may be increasing in an industry due to (1) diminishing returns resulting from the existence of scarce factor or factors whose supply is fixed for the industry, (2) rise in factor prices following transference from other uses or (3) combination of both (1) and (2).



Competitive price under increasing cost is consistent with the conditions of ideal output, for at the competitive price, price is equal to marginal social cost, or the value of marginal social product

9. Robinson, Joan, *OP.CIT.*, Book IV, Chapter 10.

(in Pigou's terminology). Under conditions of perfect competition, supply price of an industry is the same as marginal cost of the individual firm excluding rent and average cost of the firm including rent. In the above diagram, supply curve is given by P_1Y and competitive price and output at QN and ON respectively. Marginal cost of the firm excluding rent (whether accruing to fixed factors or factors drawn from other uses) is the same as marginal social cost. Increase in cost due to diminishing returns or rising transfer cost results in a higher cost to society which is completely exhausted by a price covering the increment to costs on marginal units. Rents accruing to intramarginal units do not constitute social cost. S_2 curve cannot be regarded as marginal social cost curve, because rent is not an item in social cost. S_2 curve is later replaced by Pigou by marginal supply price from the standpoint of the community. In so far as this excludes any rise in factor prices, it does not reflect marginal social cost. Rise in transfer earnings should be included and rents excluded from the social cost function. Pigou does not distinguish between these two types of factor earnings and his treatment of cost is, therefore, rather hazy.

In the final version, Pigou contemplates a diversion of competitive output from ideal output when increase in cost is due to the rise in price of imported articles used in the industry under consideration. This approach implies a consideration of welfare limited to the domestic economy only.

"The qualifications required to allow of policies," H. Ellis and W. Fellner observe, "distinguishing between the interests of domestic subjects and foreigners are much more extensive than would be suggested by the limitations of Pigou's arguments to such increase in rents as

are included in the value of commodity imports. One would have to exclude from the aggregate to be maximised all consumers' surpluses accruing to foreigners, and all producers' surpluses accruing to foreign stockholders or other foreign owners of domestic enterprise."¹⁰

Pigou's thesis that in industries with increasing returns, actual output falls short of ideal output has been upheld by later economists. There is no symmetry between external economies and external diseconomies regarding their relation to marginal cost (social). The competitive supply curve with a positive slope is, as we have seen, also the marginal social cost. On the other hand, a falling supply curve for an industry enjoying external economies, whose intersection with demand curve determines equilibrium price and output does not represent the curve of marginal social cost.

To offer an explanation of this asymmetry, we shall briefly analyse the nature of external economies. A lowering of cost curves of individual firms in a particular industry following its expansion may be due to a cheapening of factors or as Pierro Sraffa¹¹ suggests, a better rendering of services. In the first case, external economy in our industry is to be traced ultimately to the existence of internal economies in a subsidiary industry operating under imperfect competition. If the subsidiary industry can exploit its internal economies fully without jeopardising perfect competition, cost curve will be rising at the point of equilibrium and no external economy will originate from the expansion of the main industry. If the outcome of internal economies

10. Ellis, H.S., and Fallner, W., EXTERNAL ECONOMIES AND DISECONOMIES, American Economic Review, Sept. 1943.

11. Sraffa, P., LAWS OF RETURNS UNDER COMPETITIVE CONDITIONS, Economic Journal, Dec. 1926.

in the subsidiary industry is monopoly, cost will decline only if (1) it is operating in the downward range of its marginal cost and the elasticity of the new demand curve is not sufficiently smaller than was that of the old one to offset the downward slope of the marginal cost curve; or (2) if the new demand curve is more elastic than was the old one and the upward slope of the marginal cost curve in the relevant range is insufficient to offset this circumstance. Fall in the prices of factors due to increase in the scale of output is, according to Pigou, highly unlikely. He observes that increasing returns ensue as a result of growing specialisation with the expansion of the market. The example of cotton industry in England is cited, where there is not only the specialisation between the processes of spinning and weaving, but also the further specialisation between firms spinning fine counts and those spinning coarse counts. "The increased specialisation of its component firms made possible by an enlargement in an industry as a whole often involves a large reduction in costs."¹² To this may be added, as the source of external economies, better rendering of services, viz., the development of skilled labor force, the migration of a suitable labor, the appearance and progress of professional and trade associations, research institutions and the like leading to better dissemination of knowledge etc.

These various factors which give rise to external economies also account for social economy or a lowering of marginal social cost below the competitive supply curve. For a falling supply curve, a decline in the cost of intramarginal units of output is also a decrease in

¹² Pigou, ECONOMICS OF WELFARE, 4th Ed., p. 219.

social cost which is not reflected in the average curve.

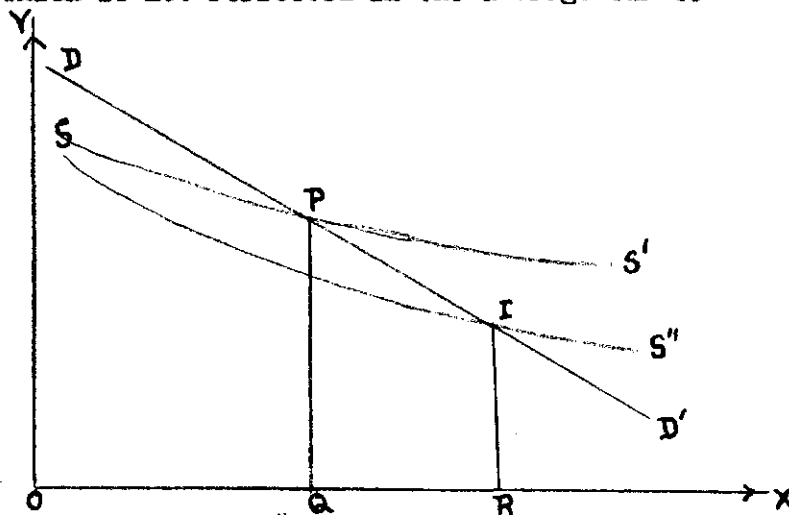


Fig. 2.

In fig. 2, the curve of marginal supply price (or marginal social cost SS'') is lower than the competitive supply curve (SS') and actual output (OQ) is less than ideal output (OR). National dividend will increase if the state grants bounty to an industry with increasing returns to cover costs of producing more than the most profitable output.

The above treatment is based on the assumption that external economies are reversible, that SS' curve is valid for both increases and decreases in the scale of output. But, as Ellis and Fellner¹³ have shown, external economies may also be irreversible in the sense that economies which result from an expansion of output persist if output subsequently contracts. In this case, the contrast of average and marginal costs cannot be used to indicate the competitive from social cost in as much as the economies simply cause a downward shift of average costs as a horizontal function up to each realised output. The case of irreversible economics can be diagrammatically presented

13. Ellis and Fellner, OP.CIT.

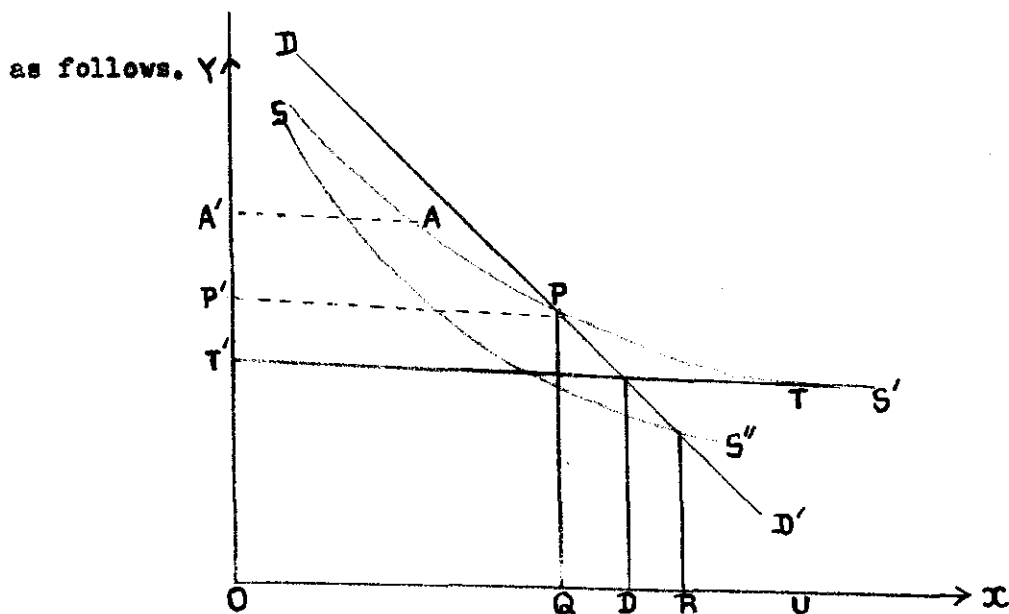


Fig. 3.

In fig. 3, SS' is the locus of successive cost curves which are horizontal to the X -axis at different scales of output. Thus once output reaches A , the average and marginal supply curve is given by AA' ; once output reaches P by PP' etc. Let T be the minimum point on the SS' signifying the disappearance of external economies at an output OU . If output expands to OU , the new supply curve will be given by TT' which will persist even if the output declines subsequently. In that case the optimum output will be given by the point of intersection of TT' and DD' ; SS'' here has no operational significance. The true optimum OD is less than the apparent optimum OR which is determined at the point of intersection of DD' with SS'' . If the government has a proper knowledge of the sources of external economies it can directly develop those sources and help industry reach the optimum output OD . This is specially true, if resources are relatively immobile and transference involves a large amount of cost.

If external economies are also accompanied by a rise in factor

prices, rent on intramarginal units should be excluded from the marginal social cost for the determination of the optimum.

We have implicitly assumed in our above discussion that there is perfect correlation between external economies enjoyed by an industry and an expansion in the scale of its output. This assumption is subject to modification in two ways. In the first place, external economies originating in a particular industry need not be confined to that industry alone, but is likely to spread to other sectors of the economy. Secondly, there seems to be much truth in Sraffa's¹⁴ observation that external economies are often the resultant of the development of the economic system as a whole. Economies which are internal to the industry but external to the firms composing it are a rare phenomenon. This explains why some economists have pleaded that external economies are essentially dynamic and they cannot be usefully treated within the framework of a static analysis.

All these considerations about external economies weaken Pigou's case for subsidising an industry with a falling supply curve. The economies may largely accrue to other industries rather than to the industry under review. It is only that part of external economies which are enjoyed by one particular industry that is reflected in its supply curve. What is relevant for the social optimum is the sum total of economies which is obscured in Pigou's treatment of the problem, though his definition of marginal social product makes allowance for it. We shall see in the next chapter that R. F. Kahn¹⁵ attempted a fuller

14. Sraffa, OP.CIT.

15. Kahn, R.F., NOTES ON IDEAL OUTPUT, Economic Journal March, 1935.

treatment of external economies by slightly altering Pigou's definition of marginal social product. Secondly, economies in a particular industry may be less in magnitude than those which prevail on the average in industry as a whole, so that the industry under review is producing more and not less than its ideal output. But this case is excluded by Pigou's assumptions. In his system, ideal output is attained by a large sector of the economy, barring a few exceptional cases. Thirdly, existence of economies may fail to be fully revealed in a falling supply curve owing to the existence of scarce factors. Therefore, if external economies spread from other industries, the supply curve of the first industry may not indicate it due to external diseconomies. Finally, Pigou's case for bounty on decreasing cost industries financed by taxes on other industries holds good, if economies are the exception and not the rule. If economies are prevalent over a large sector of the economy, all of them need not necessarily be subsidised. The imposition of tax on other industries may induce decreasing cost industries to expand; and if this expansion would carry the industry's output beyond the ideal point, a tax and not bounty is called for.

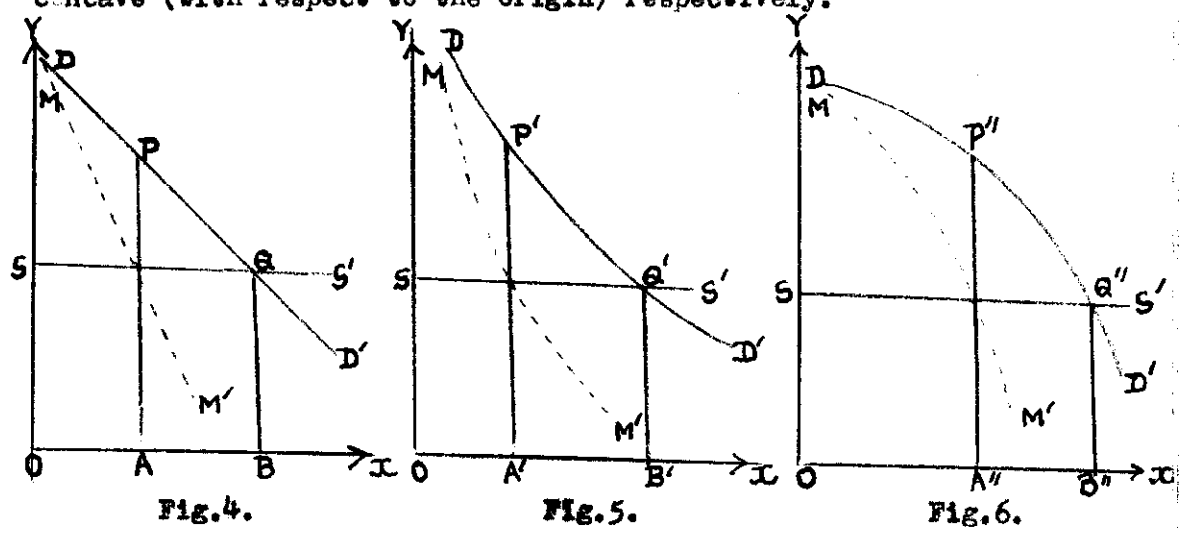
(III)

Pigou's comparison of output under monopoly and discriminating monopoly with competitive output is enlightening and the discussion has been carried one step further by Mrs. Robinson.¹⁶ Pigou's state-

16. Robinson, OP.CIT. Book IV, Chs. XI, XII, and XIII.

ment that under simple monopoly, output will always, other things being equal, be less than it would have been under simple competition, may be reviewed and elaborated in the form of a diagrammatic analysis. Comparison of monopoly output with competitive output is made on the assumption that demand and cost curves which prevail under perfect competition are not changed due to introduction of monopoly. Several cases can, then, be distinguished.

(1) There are no scarce factors and no economies of large scale so that the cost curve for the industry under review is constant. It is easy to see that in such a case, monopoly output will be half (fig.4), less than half (fig.5), and more than half (fig.6), the competitive output according as the demand curve is a straight line, convex and concave (with respect to the origin) respectively.



St. line demand curve: monopoly output $OA = \frac{1}{2}$ competitive output OB .
 Convex demand curve: monopoly output $OA' < \frac{1}{2}$ competitive output OB' .
 Concave demand curve: monopoly output $OA'' > \frac{1}{2}$ competitive output OB'' .

Under perfect competition, price and output are determined at the point of intersection of the supply curve SS' and demand curve DD' .

Under monopoly, price and output are determined at the point of inter-

section of marginal revenue curve MM' and marginal cost curve SS' .

(2) There are scarce factors and no economies of scale so that the supply curve for the industry has a positive slope. In this case, a new factor emerges, namely rent. Monopoly output will be different depending on whether the monopolist pays rent (in full or in part) to the scarce factors or not.

(a) Let us assume that the monopolist pays full rent to the scarce factors. If the demand curve is a straight line, monopoly output will be half, less than half or more than half the competitive output, according as the supply curve is straight line, concave or convex respectively.

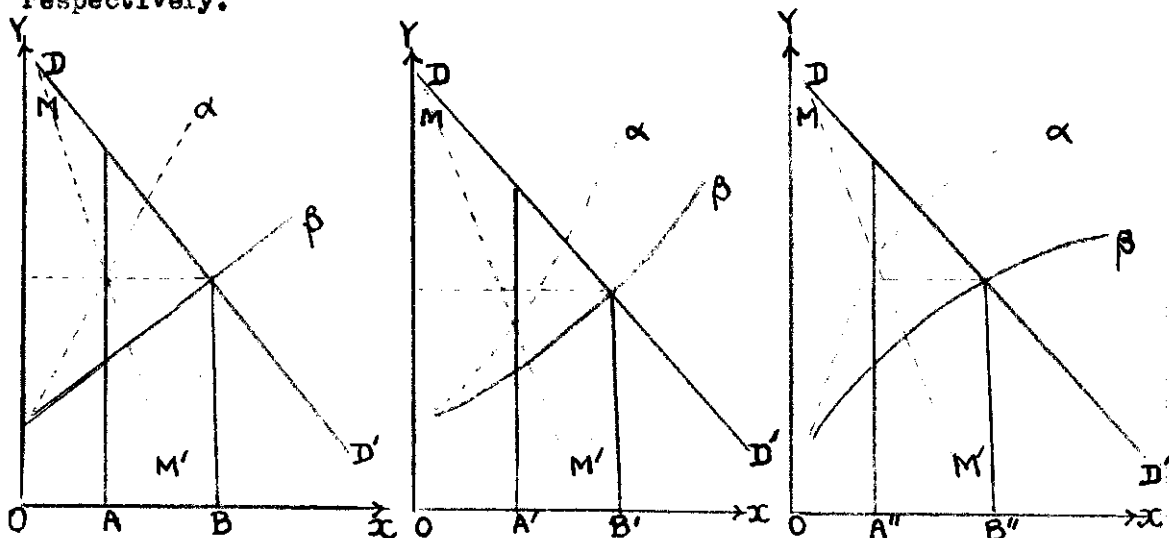


Fig.7.

Fig.8.

Fig.9.

β is the average cost including rent or marginal cost excluding rent. Competitive output is given by the intersection of DD' and β . Since the monopolist pays full rent to the factors, the relevant marginal cost curve for him is α (marginal cost including rent). The intersection of α and marginal revenue curve MM' gives monopoly price and output. In Fig. 7, supply curve is straight line and monopoly

output $OA = \frac{1}{2}$ competitive output OB . In fig. 8, monopoly output $OA' > \frac{1}{2}$ competitive output OB' , supply curve being convex. In fig. 9, monopoly output $OA'' < \frac{1}{2}$ competitive output OB'' , the supply curve being concave. In a similar way, it can be shown that when the supply curve is a straight line, monopoly output will be less than half the competitive output for a convex demand curve and greater than half for a concave demand curve. Convexity of demand curve and concavity of supply curve lead to a smaller proportion of monopoly output to competitive output and conversely. In any actual case, output will depend on the curvature of both demand and supply curves. But monopoly output, on the above assumptions, can never exceed competitive output. At most, monopoly output can be equal to competitive output in only few exceptional cases requiring particular shapes of demand or cost curves.

(b) The monopolist may not pay full rent to the scarce factors. If he hires land, the rent paid is likely to be somewhere in between full rent and transfer earnings. As regards labor, it will not be easy for the monopolist to avoid paying rent in so far as he cannot make separate bargains with individual workers. Rent of entrepreneurship will not be regarded as part of expenses of production, but as part of monopoly profit.

If the monopolist pays part of the rent to any factor but not the whole of it or if there are some scarce factors for which he pays full rent and others for which he pays none, his marginal cost will be somewhat greater than average cost to the competitive industry, i.e., it will lie between α (marginal cost including rent) and β (marginal cost excluding rent or average cost including rent) curves. If the

monopolist does not pay any rent to the scarce factors, his marginal cost curve will be given by B and the intersection of B and marginal revenue curve MM' will determine monopoly output. If the monopolist does not pay or pays only part of the rent to scarce factors his output will exceed the amount he will produce if he has to pay full rent. But in neither of the cases will monopoly output exceed competitive output.

(3) There are economies of scale resulting in a decreasing cost curve. It can be shown that the conclusions which hold for increasing cost industries, the monopolist paying full rent to the scarce factors, are also valid in this case. The relation between competitive output and monopoly output will be given by the same formulas noted above. So long as the monopolist pays rent to the scarce factors, his output will be less than competitive output even if there are economies of scale. Because for any output greater than competitive output, monopolist's revenue will be negative.

There is one case, however, where Pigou's general proposition has to be modified. If the fact of nonpayment of rent to scarce factors is accompanied by economies of large scale industry, monopoly output may exceed, though not necessarily, competitive output. This result is shown in the fig. 10.

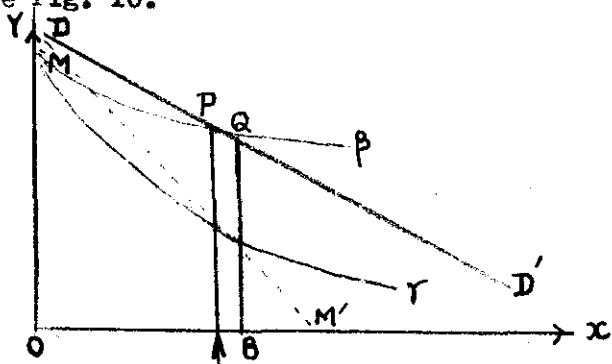


Fig. 10.

The relevant cost curve for the monopolist is given by γ (marginal cost excluding rent). It lies below both β (average cost including rent) and α (marginal cost including rent). The intersection of γ with marginal revenue MM' determines monopoly output OB . If the demand curve is sufficiently elastic at the competitive output, monopoly output (OB) is likely to exceed competitive output (OA).

Pigou's appraisal of monopoly on welfare grounds is based on the tacit assumption of the prevalence of free competition over a large sector of the economy. The sense in which Pigou analyses deviation from optimum is changed if we withdraw this restrictive assumption. This will be discussed in detail in the next chapter in connection with the welfare economics of R. H. Kahn and Mrs. Joan Robinson.

We shall end up the discussion of monopoly with a few comments on Pigou's observations on price control. If the competitive price is fixed under increasing cost conditions, the monopolist will produce less than the competitive output. This is illustrated in the fig. 11. The competitive price and output are denoted by PA and OA respectively. If monopoly price is fixed at AP , the monopolist's average revenue will be completely elastic up to the output OA and then will decline along PD' . Marginal revenue curve will not be given by MM' , but by $DPCM'$. The intersection of $DPCM'$ and marginal cost α (it is assumed that the monopolist pays full rent to the scarce factors) will determine monopoly output OB , which is less than competitive output.

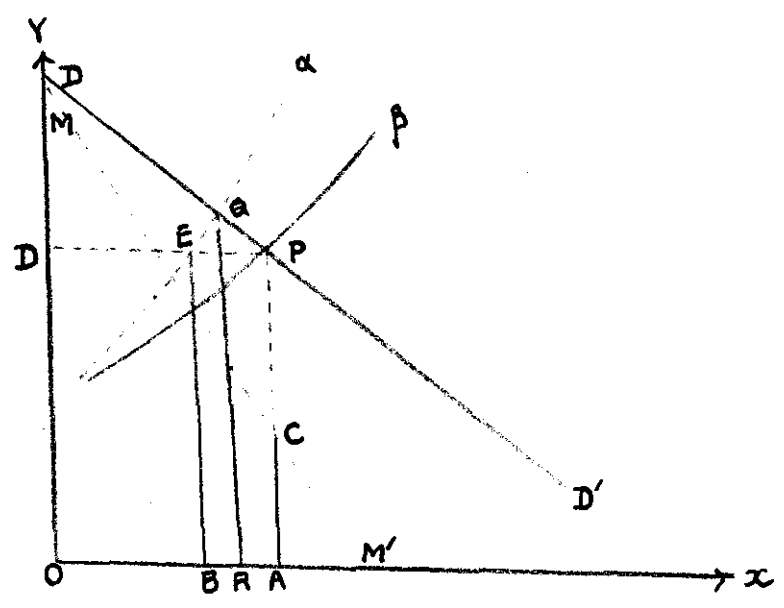


Fig. 11.

On examination, it is seen that monopoly output under price control will be higher than unregulated monopoly output only if the marginal cost curve (α) cuts the old marginal revenue curve MM' to the right of E (the point of intersection of MM' and DP); it will depend on the curvature of both DD' and P . The imposed price which will evoke the greatest output (OR) from the monopolist under rising cost conditions is given by that which equalises the demand price and marginal cost. (QR).

Pigou observes that when constant or decreasing supply prevails, it will not pay a monopolist, when price is fixed at the competitive level to reduce output below competitive output, for he would not secure any diminution in cost by doing this. The validity of Pigou's observations can be explained with the help of diagrams.

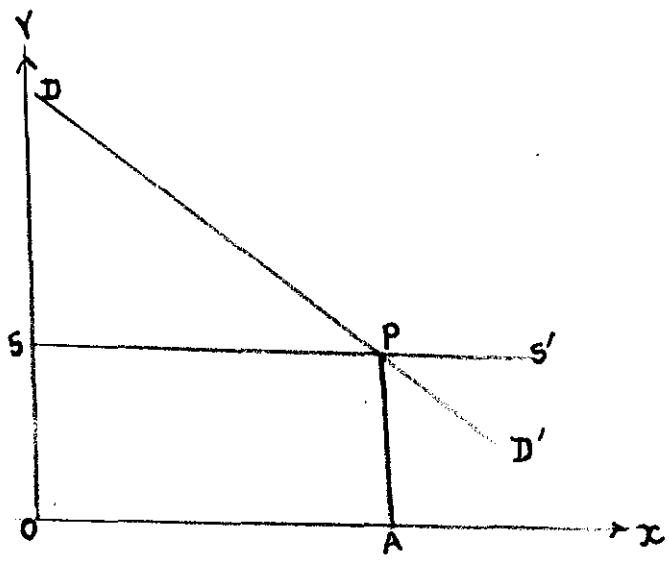


Fig. 12.

In fig. 12, the monopolist's marginal and average cost curve is given by SS' . If the competitive price PA is fixed, the monopolist will not gain by producing less than the competitive output and his equilibrium output will be given by OA (same as competitive output).

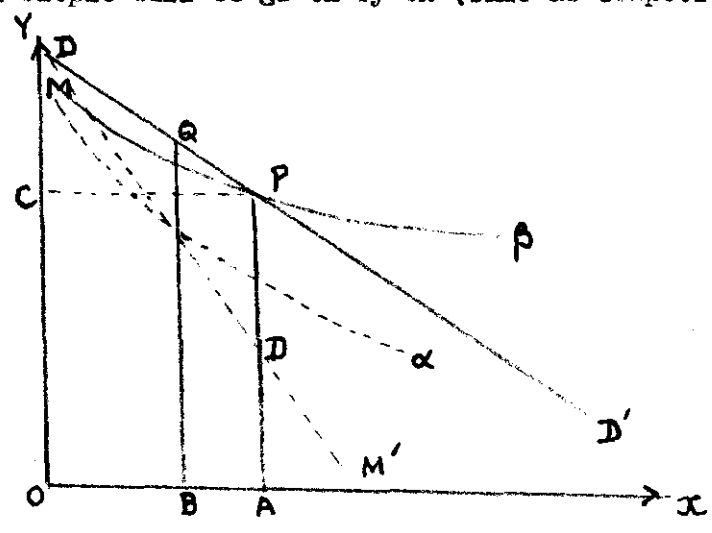


Fig. 13.

In fig. 13, OA is the competitive output and AP the competitive price. OB is the uncontrolled monopoly output and BQ the monopoly price. If price is fixed at AP , monopolist's marginal cost curve 2

will cut the new marginal revenue curve CPDM' between P and D, thus the monopolist will realize his maximum net revenue at the competitive output. Thus under conditions of falling cost, the competitive output can be evoked from the monopolist by fixing the competitive price as a maximum.

(IV)

We can draw the following conclusions from the above analysis. In the first place, Pigou's use of the concept of equilibrium firm and archetypal industry does not involve any sharp break from the modern analysis so far as the conclusions are concerned. Evidently the attributes which Pigou's equilibrium firm possesses are to be extended to all individual firms in equilibrium to bring the Pigovian system in line with the more recent approach. It will be seen the next chapter that R. F. Kahn¹⁷ and Joan Robinson¹⁸ developed some of the arguments of Pigou without deviating from him in fundamentals. They used the modern concept of the equilibrium of industry and individual firms. Secondly, Pigou's treatment of ideal output is vitiated by the confusing distinction between supply price from the standpoint of the community. He fails to take into account that part of rise in cost which is due to the foregoing of utilities and as such enters into marginal social cost. Thirdly, Pigou's practical insight is seen in his treatment of the evaluation of marginal social products of resources in connection with the determination of ideal output. Most of the economists belonging to the group of New Welfare Economics shunned the discussion of the important type of divergence between marginal private

17. Kahn, OP.CIT.

18. Robinson, OP.CIT.

and marginal social products which relate to what Pigou calls third party services or disservices. The evaluation of marginal social product, we have noted above, is undoubtedly extremely difficult. But Pigou makes a practical compromise. Many, though not all, of the social costs which are not taken into account of by the pricing mechanism in a competitive economy can be evaluated and brought under the measuring rod of money. There is no reason for excluding them on the ground that other social costs which should theoretically be taken into consideration cannot be evaluated. Fourthly, Pigou's recommendations about decreasing cost industries are based on the assumption that external economies are confined within the particular industry under review. We have seen that decreasing supply curve in any industry is an imperfect guide to fiscal interference when external economies are defined in a broader sense. The results also substantially differ when external economies are not reversible. Fifthly, Pigou's treatment of ideal output under monopoly is based on the assumption of the prevalence of simple competition in a large sector of the economy. His policy recommendations accordingly apply to the particular institutional situation which he considers. Kahn¹⁹ generalises Pigou's system by extending it to the case of monopolistic competition. Finally, the use of modern firm analysis for the comparison of monopoly and competitive output reinforces most of the views held by Pigou. Several distinct cases are obtained under the hypotheses of varying cost and demand curves, which are not considered by Pigou. It is also seen that rent plays an important part in determining monopoly output

19. Kahn, OP, CIT.

CHAPTER V.

POST-PIGOVIAN WELFARE ECONOMICS: I

R. F. KAHN and JOAN ROBINSON

(I)

In this and the next chapter, we shall attempt a brief presentation of Post-Pigovian welfare economics. A detailed examination of these later developments is beyond the scope of this study and the writer does not propose to take up that formidable task. It is worth while, however, to throw light on the basic postulates and conclusions of welfare economists who followed Pigou and see how they stand with respect to the Pigovian system. In this chapter, welfare propositions of R. F. Kahn and Joan Robinson are discussed in some detail on the ground that they are derived from a direct extension of Pigou's system with some conceptual refinements. In Chapter VI, new welfare economics to which J. R. Hicks, Abba P. Lerner, Oscar Lange, Harold Hotelling, Nicholas Kaldor, Abram Bergson, Tibor Scitovsky, Paul Samuelson, Melville Reder, and a few others have contributed in some way or other will be presented.

R. F. Kahn's¹ economics of welfare is Pigovian in fundamentals. His excellence lies in conceptual refinements and extension of Pigou's system to the case of monopolistic competition. Kahn makes the following three assumptions which are also made by Pigou:

(1) Factors of production are always kept fully employed;

1. Kahn, NOTES ON IDEAL OUTPUT, Economic Journal, March, 1935.

(2) Money can be employed as a measure of utility. It is based on the implicit assumption of an equalitarian distribution of income;

(3) A given quantity of productive resources is being employed . Once these assumptions are made, an increase in the size of national dividend will represent an increase in economic welfare.

Kahn uses the concepts of marginal private and marginal social product as Pigou does. But his definition of these concepts gains in precision and validity. Pigou's definition of marginal social net product is quite general; it refers to the aggregate of goods and services accruing from a marginal increment of a factor, no matter to whom they accrue. But when he elucidates the problem presented by increasing and decreasing supply price, he restricts the connotation of the term. Economies leading to decreasing supply price are supposed to result from an expansion of the industry under review, and thus a unique correspondence between the supply curve and the presence of economies or diseconomies in a particular industry is established. The fact that supply curve of an industry may be influenced by the existence of economies in a different industry is not taken into account. Once it is admitted that the effects of economies arising in any group of individual firms are not necessarily confined within any particular industry, it follows that there is no unique correlation between an industry's supply function and economies originating in it.

In view of these considerations, Kahn defines marginal private product and marginal social product expressedly with respect to individual firm. If an increase in the output of firm x has no effect on the efficiency of any given combination of factors outside firm x,

the marginal social product is identical with the marginal private product. If the increase in output has a favorable effect on efficiency elsewhere, production is attended by external economies; marginal social product exceeds marginal private product. In the converse case, when production is attended by external diseconomies, marginal social product falls short of marginal private product. "The nature of the allocation of the external economies (or diseconomies) is not germane to our enquiry--their aggregate amount is all that matters."² The terms external economies and diseconomies should not be interpreted as accruing to other firms in the same industry.

Pigou phrases his welfare propositions in terms of the distinction between supply price simpliciter and supply price from the standpoint of the community. Secondly, he uses the conceptual tool of an archetypal industry in which the values of marginal private and marginal social products are equal. There is an underlying assumption of the prevalence of a competitive economy in which monopoly is an exception.

Kahn rejects the perplexing distinction between supply price simpliciter and supply price from the standpoint of the community, and expresses welfare propositions in terms of external economies and diseconomies. No assumption as to the equality of marginal private and marginal social products in the generality of industries is made. On the basis of these changes, Kahn defines the ideal output of an industry as "that which causes the values of marginal social products of the marginal units of each factor to have the same ratios to the values of their marginal private products as they would in the industries

2. Kahn, IBID., p. 5.

from which they would have to be drawn."³

In defining the criterion of policy under a system of perfect competition, Kahn follows Shove.

"The national dividend would obviously be increased by transferring resources from industries where.....net external economies are small or negative to those where.....net external economies are large."⁴

It is not the nature of industries in any absolute sense, but their relative deviations from the average which provide a case for interference.

External economies, Kahn observes, must usually take their ultimate origin in the internal economies of some subsidiary industry.

This implies imperfect competition in the subsidiary industry. Accepting the hypothesis that external economies originate in subsidiary firms producing under conditions of falling cost, Kahn explores the practicability of his welfare solution. Instead of assessing the extent of external economies present in every industry, it is easy to recognise indivisible units being worked below optimum capacity. In such cases, viz., railways, public utilities, etc., subsidy or bounty is recommended. Further, the proposition that in case of identical industries, no diversion of resources is called for has to be modified. If economies take their origin in subsidiary industries, the case for expanding these subsidiary industries holds good; diversion of resources vertically from lower to higher stages of production will increase national dividend. A similar point is illustrated by the case of smoke. If all industries are equally

3. IBID..

4. Shove, G.F., VARYING COSTS AND MARGINAL NET PRODUCTS, Economic Journal, June 1928.

smoky, no horizontal diversion of resources is necessary. But legal restrictions on the emission of smoke and the encouragement of methods of preventing smoke would still have an important part to play.

"Maximization of welfare involves both ideal quantity of output and ideal method of production. The national dividend is maximized only when the value of marginal social product of each separate marginal unit of a factor is equal in all uses, both potential and actual."⁵

It is seen that the existence of different degrees of external economies in the economy can be traced to the divergence between price and marginal cost to society. In all cases, Kahn observes, failure of laissez faire to achieve the best of all possible worlds may be fairly laid at the door of the imperfection of the pricing system.

(II)

Kahn⁶ and Mrs. Robinson⁷ extended Pigou's welfare proposition to the case of imperfect competition. Under conditions of imperfect competition, optimum allocation of resources is not attained due to the divergence between marginal cost and price (apart from the question of external economies.) With a less than perfectly elastic demand curve for the individual firm, marginal revenue is less than price. The motive for profit maximization leads to the equation of marginal cost and marginal revenue. Thus, under imperfect competition, marginal cost is also less than price.

Three cases may be distinguished:

- (1) There is a perfect market for factors and an imperfect market for

5. OP.CIT., p. 15.
6. IBID., p. 19 ff.
7. Robinson, Joan. OP.CIT. Books IX and X.

products.

(2) There is an imperfect market for factors and a perfect market for products.

(3) Both the factor and product markets are imperfect.

Case (1). Since factor market is perfect, marginal cost to the individual firm is equal to the price paid to the marginal factor. Marginal cost and marginal revenue being equal, the margin of transfer consists of units for which marginal physical product multiplied by marginal revenue is the same in different uses. Due to the divergence of marginal cost and marginal revenue from price, there is no necessity that marginal physical product times price will be equalized in alternative uses of a factor. Ideal output is not attained because,

$$\frac{\text{marginal revenue (1)}}{\text{Price (1)}} / \frac{\text{marginal revenue (2)}}{\text{Price (2)}} \text{ etc.}$$

where, 1,2,....denote different firms or commodities. It is seen that the equation of the valuation of marginal product of a factor in different uses involves that the above ratios marginal revenue/price must be equal; it does not require the condition of equation of marginal revenue and price.

We can analyse a step further. The ratio marginal revenue/price is equal to $1 - (1/e)$, where e is the elasticity of demand for the product of the firm. It follows that the divergence between marginal revenue and price varies inversely as the elasticity of demand for the individual firm. "The elasticity of demand for the individual firm can be employed as an inverse ordinal measure of imperfection of

competition."⁸

From the preceding analysis, the criterion of policy is derived. It is socially desirable, Kahn observes, to expand those industries in which competition is more imperfect than the industries with which they compete for their factors of production and to contract those in which the opposite condition prevails. "It is not the absolute degree of imperfection but the deviation from the norm which determines the direction and the magnitude of the deviation from ideal output."⁹ It may be noted that the central proposition of optimum allocation is the same for both perfect and imperfect competition; the degree of imperfection of competition takes the place of the amount of external economies.

Case (2). It is assumed that the factor market is imperfect and the product market is perfect. Kahn did not discuss this problem, the analysis that follows is due to Mrs. Robinson.¹⁰ Different degrees of imperfection in the factor market hamper optimum allocation of resources. Due to perfection of the product market, marginal physical product of a factor multiplied by marginal revenue is also equal to marginal physical product times price of the product. But marginal physical product multiplied by marginal revenue is not, in this case, the margin of transfer. Imperfection in the factor market leads to a divergence between remuneration paid to factors and their corresponding marginal cost. If the ratio marginal factor cost/ factor price is not the same in different uses, there is no tendency toward equalization of the

8. Kahn, OP.CIT., p. 20.

9. IBID., p. 21 ff.

10. Robinson, OP.CIT. Book IX, Chapter 25.

value of marginal physical products and optimum allocation is not attained. The ratio marginal factor cost/ factor price is equal to $1 + (1/\epsilon)$ where ϵ denote elasticity of supply of factor to the firm. Hence the difference between marginal factor cost and factor price varies inversely as the elasticity of supply of the factor under consideration.

Case (3). Now we can combine the assumptions of imperfection of both product and factor markets and see how they affect allocation. It is seen that there is misallocation of resources if the application of any factor to its different uses leads to different values of the ratio of factor price to the value of its marginal physical product. Now.

$$\frac{\text{Value of marginal physical product}}{\text{Factor price}} = \frac{\text{Value of marginal ph. product}}{\text{Marginal revenue product}} \cdot X$$

$$\frac{\text{Marginal revenue product}}{\text{Factor price}} = \frac{\text{Value of marginal ph. product}}{\text{Marginal revenue product}} \cdot X$$

$$\frac{\text{Marginal factor cost}}{\text{Factor price}} = \frac{e}{e-1} \cdot \frac{\epsilon + 1}{\epsilon} ,$$

where e and ϵ denote the elasticity of demand for product and elasticity of supply of factor respectively. By marginal revenue product we mean marginal physical product times marginal revenue. The substitution of marginal factor cost for marginal revenue product is justified on the ground that they are equal at the point of equilibrium.

If the ratio $(e/(e-1)) ((\epsilon + 1)/\epsilon)$ is the same in different uses of a factor, values of marginal physical products are equalised and there is no case for transference of resources. National dividend

will increase through reallocation when the ratios $(e/(e-1)) \cdot ((E + 1)/E)$ are not equal. It may be seen that the divergence from optimum allocation will vary inversely as the elasticity of demand for product and elasticity of supply of factor to the individual firm.

(III)

We have considered above the criteria, which, under different assumptions regarding imperfection, will improve the allocation of resources among individual firms. Kahn¹¹ considers the marginal product of management and extends the general welfare proposition to indicate whether movement of entrepreneurship from one industry to another or change in the number of firms will increase national dividend. A distinction is made between the hiring factor, the entrepreneur, and the hired factors of production. The marginal physical product of an entrepreneur is defined as the increment of output which society obtains as a result of the application of an additional entrepreneur to a particular type of production, the natural units of all other factors employed by industry as a whole remaining the same as before. In order to relate marginal product of entrepreneurship to the maximum welfare proposition, two things are considered; first, the relation between the value of the marginal physical product of an entrepreneur and his wage and secondly, the relation between the value of his marginal physical product and his marginal social productivity.

Under conditions of perfect competition, the entrepreneur of a

11. Kahn, OP.CIT., p. 22ff.

firm which does not give rise to any external economies receives a reward equal to the value of his marginal product. The remuneration of an entrepreneur is given by the total value of the output he produces minus the outlay on hired factors. If a firm is closed down and the factors it was employing are redistributed, output will be changed by an amount which is equal to the expenditure on the firm's output minus the value of the marginal product of hired factors when employed in other firms. This change in output measures the value of marginal product of the entrepreneur. Since under perfect competition, the remuneration paid to the hired factors by other firms will be equal to the value of their marginal physical product, it follows that the entrepreneur receives a reward which is equal to the value of his marginal product. If external economies originate in a firm, the entrepreneur's earnings will fall short of his marginal product (which is also equal to the value of his marginal social product in this case) by the amount of economies to which he gives rise. Thus there is perfect symmetry under condition of perfect competition between entrepreneur and hired factors regarding the relationship of their earnings to their marginal products.

This symmetry does not hold when conditions of imperfect competition operate. The hired factors receive less than the value of their marginal products by an amount which also measures the excess of entrepreneur's earnings over the value of his marginal product. This follows from the line of reasoning developed above. But here the distinction between marginal private product of the entrepreneur and his marginal social product is important.

Kahn takes account of two parameters to classify possible cases. One parameter depends on the extent to which the entrepreneur competes for his factors with similar entrepreneurs, working under the same degree of imperfection as he is himself and on the extent, on the other hand, to which he competes for his factors with industry in general. The parameter involves the question whether and to what extent imperfection of competition is due to rational and irrational buyer's preference. This distinction is significant for welfare.

"The imperfection of the market is purely irrational if it takes its origin in preferences which obtain no justification, when they are satisfied, in actual enjoyment and the thwarting of which causes no loss of satisfaction."⁷

Irrational buyers preference is to a large extent due to ignorance, habit, tradition or inertia. Imperfection is purely rational if it takes its basis in preferences which correspond to real satisfaction. Imperfection as a result of cost of transport, natural conditions giving rise to monopoly are of the rational type.

When imperfection of the market is purely irrational, marginal private and marginal social net products of entrepreneurship are equal. When the imperfection is rational, marginal social product of the entrepreneur exceeds the value of his marginal physical product. This can be further elaborated. In case of irrational buyers' preference, the entrepreneur is one among many producing virtually identical commodities. His output represents only a small part of the total output of the commodity and the price for his output can be taken to measure the total value to society of his output. When buyers' preference

7. IBID., p. 25.

is rational, we are presented with the case of a single firm producing the whole output of a single commodity. Consumers would be willing to pay a larger amount than they do for the whole output of a commodity rather than go without it altogether. The entrepreneur's marginal social product will be measured by his firm's physical output multiplied by its average utility (not marginal utility as in the other case) minus the value of the marginal product of hired factors. The excess of marginal social product over marginal physical product is given by the excess of the average over marginal utility of output, multiplied by the amount of output.

If each entrepreneur competed for factors with other entrepreneurs in the same industry and irrational buyers' preference exists, reward of the entrepreneur will exceed the value of his marginal social product (here value of marginal physical and marginal social product are equal) by an amount varying with the degree of imperfection of competition in that industry. To be more precise, marginal social product of an entrepreneur

= his earnings - factor cost/(e-1), where e is in some sense the average elasticity of demand for the individual firm in the particular industry.

The divergence between an entrepreneur's marginal social product and his remuneration thus depends on the imperfection of competition given by e and also on the magnitude of the firm's outlay on factors, or size of the firm. Apart from the nature of demand curve and imperfection of the market, size of the firm is also influenced by technical conditions of production expressed by the cost curve. From the above analysis, it is evident that national dividend can be increased by

diverting entrepreneurs away from any industry in which imperfection of competition exceeds the average and by attracting them into any industry in which imperfection falls short of the average. The type of diversion which is called for where firms are naturally large is the same in direction as that which is called for where the imperfection of competition is great.

Turning to the case, where imperfection is irrational and each entrepreneur competes for his factors of production with industry in general, we see that the above equation of marginal social productivity of the entrepreneur is still valid, when e implies the average elasticity of demand for the individual firms taken over industry as a whole. Since e is now the same in all uses, differences in marginal social productivity will result from size of the firm. Once again, diversion of entrepreneurship from uses where firms are large to those where firms are small is calculated to increase national dividend.

It should not be supposed that entrepreneurs always make a positive contribution to society. There may be cases of redundancy of firms when a reduction in the number of entrepreneurs will be conducive to an increase in economic welfare. This will happen when marginal social product of an entrepreneur is negative, although his earnings are positive. If there are strong forces of internal economies in the generality of firms in any industry making for a falling average cost of hired factors, marginal social product of an entrepreneur in the industry is likely to be negative and optimum allocation requires a reduction in the number of firms in the industry.

Let us now take up the case of rational imperfection. Here marginal social productivity equation is different and as Kahn⁸ puts it.

marginal social product of an entrepreneur

= his earnings - factor cost/(e-1) + addition to revenue

caused by perfect discrimination, when e is the elasticity of demand for the individual firms with which he competes for his factors of production. When $e = \infty$, i.e., the entrepreneur operates in a world of perfect competition, his marginal social product is the same as his total profit obtained by perfect discrimination, (because the second term on the right hand side of the above equation reduces to zero). It is very unlikely, Kahn⁹ observes, that a firm earning a positive profit will have negative marginal social product in case of rational imperfection.

when each entrepreneur competes for his factors of production with similar entrepreneurs, it is possible that the excess of his marginal social productivity over his earnings will be greatest when competition is most imperfect. It is therefore socially desirable to divert entrepreneurs from subnormally imperfect industries to abnormally imperfect ones. In the case, where each entrepreneur competes for his factors with industry in general, the same conclusion holds good as indicated by different values of the third term on the right hand side of social productivity equation (e being constant).

8. IBID., p. 33.

9. IBID., p. 34.

(IV)

The following significant conclusions are derived from the above analysis of R. F. Kahn's and Joan Robinson's welfare economics. In the first place, the above writers make a significant contribution to welfare economics by extending Pigou's general welfare proposition to the case of imperfect competition. In doing so, they start from the same assumptions, including the measurability of utility and interpersonal comparison of utility, which Pigou makes. In Pigou's system of simple competition with an admixture of monopoly, the general welfare proposition that marginal social product of resources must be equalised in all uses is reduced to the particular proposition that marginal private and marginal social products must be equalised in every use. Guided by the practical interest which Pigou has, Robinson and Kahn consider that Pigou's model does not fit with reality; imperfect competition conforms more to actual practice. Perfect competition implies the equality of marginal cost and price; imperfect competition in the product market, on the other hand, leads to a divergence between marginal cost and price. When the divergence between marginal cost and price is general due to imperfect competition, an attempt at their equalisation is not good economic policy and is also not a necessary condition for the maximization of welfare. The equalisation of marginal social products can be brought about by making the ratios between marginal private and marginal social products equal. In other words, what is called for in a system of imperfect competition is not the equalisation of factor price and

value of marginal physical product of resources but of their ratios in different uses (apart from external economies). When there are external economies or diseconomies, values of marginal private products and marginal social products will not be the same and the relevant ratio which required equalisation is then given by that between factor price and value of marginal social product. We have seen that the divergence between factor price and value of marginal private product can ~~arise~~ arise from two sources, imperfect competition in the product market and imperfect competition in the factor market and the existence of any of these two types of imperfection in unequal degrees in the economy results in a deviation from the optimum. One important point may be mentioned in this connection. Apart from the issue of dealing with imperfect competition, Kahn and Robinson give a more general interpretation of Pigou's welfare proposition than what Pigou himself does. The equality of factor costs and value of marginal private products under perfect competition can be regarded as a special case of the equality of the ratios between factor costs and values of their marginal social products. To take account of imperfect competition, Kahn and Robinson do not restrict the value of elasticity of demand for product or for factor to infinity and thus their system gains in generality.

Secondly, it is seen that Pigou's welfare proposition can be interpreted to yield many interesting results which Pigou does not discuss. Thus Kahn considers the marginal social product of entrepreneurship and develops the criterion of determining the optimum number of firms in any particular industry in a system of

imperfect competition. Of course, the whole discussion revolves round the distinction between rational and irrational consumers' preference.

Thirdly, Kahn considers the possibility that economies originating in one industry may spread to other industries. By broadening the definition of external economies and marginal social product, he includes the cases which are excluded from the Pigouvian system. In Kahn's analysis, firms rather than industries become the center of importance. Marginal social product includes the total output due to the application of resources by any firm, no matter whether the output accrues to the industry of which the firm is a member or not. We have noticed that Pigou considers the case of increasing and decreasing cost industries and suggests inter-industry transference of resources for increasing the national dividend. Kahn, emphasizing on the role of firms, brings out the case for intra-industry movement of resources, even when there is no justification for transference of resources between industries. Thus when economies originate in a subsidiary industry, transference of factors vertically from the lower to higher stages of production is calculated to increase national income, even though no horizontal diversion of resources is called for.

Finally, while dealing with the realistic case of imperfect competition, Kahn does not offer any easy solution so far as practical policy is concerned. He also advocates the fiscal devices of taxes and bounties. But fiscal control geared to bring about the optimum allocation of resources when the degrees of monopoly power wielded

by different industries vary within wide limits, is exceedingly difficult to operate. The estimation of the divergence between factor cost and value of marginal social product and fixation of an optimum rate of tax or bounty are in fact baffling problems. Dealing with perfect competition, on the other hand, Kahn suggests an easier solution. He discovers that most of the external economies take place in subsidiary firms being worked below optimum capacity. In Pigou's analysis, the nature and amount of tax or bounty depend on a comprehensive examination of the supply curve of industries from the standpoint of the community. This is rather vague and confusing for the reasons discussed above. Kahn makes a more specific and clear-cut recommendation. He advocates bounties to lumpy investments being worked below optimum capacity, like railways, public utilities, etc.

To sum up, Kahn and Robinson improve upon Pigou's thesis without making any assumption conflicting with Pigou's. We shall now examine the contribution made by new welfare economics.

CHAPTER VI

POST-FIGOVIAN WELFARE ECONOMICS II :NEW WELFARE ECONOMICS

(I)

Much of the controversy after the publication of Pigou's classic treatise centered round the question of the measurability of utility and interpersonal comparison of utility. We have seen that Pigou made both these assumptions. From the postulate that marginal utility of income to different individuals living in a community is the same, he derived his proposition of equal distribution of income as a necessary condition of the maximisation of welfare. The acceptance of utility calculus enabled him to regard the size of the marginal social product as the measure of increase in subjective economic welfare.

The attempt that was being made to free the analysis of value from the assumption of the measurability of utility had its impact on welfare economics. Robbins'¹ warning that economists should keep away from prescriptions because interpersonal comparison of utility is not possible appears to have had some effect on his contemporaries. R. F. Harrod, however, had a dissentient voice and in an address published in the *Economic Journal*, he observed,

"If the incomparability of utility to different individuals is strictly pressed, not only are prescriptions of the welfare school ruled out, but all prescriptions whatever. The economist as an adviser is completely stultified and . . . he had better be suppressed completely. No - some sort of

1. Robbins, L., "Interpersonal Comparison of Utility", *Economic Journal*, Dec, 1938.

postulate of equality has to be assumed. But it should be carefully framed and used with great caution."²

Shortly afterwards, N. Kaldor³ devised a method to circumvent the difficulty presented by the problem of interpersonal comparison of utility. This ingenious device was readily taken up by Hicks. The literature on welfare economics which was developed on the basis of this refinement has been called New Welfare Economics. Economists belonging to this group, apart from minor differences, have attempted, with a methodological rigor characteristic of Pareto, to present a scientifically acceptable welfare economics, free from the blemish of interpersonal comparison of utility. They have defined the optimum and derived its properties. Bergson and Samuelson have focussed attention on the number and nature of assumptions involved in welfare economics, specially assumption about ends. At the same time they have provided the framework of a more generalized welfare economics.

Old welfare economics had been exposed to a dual attack, on the validity of interpersonal comparison of utility and of the definition of utility as a cardinal number. New welfare economics has tried to avoid both these pitfalls. It is seen that a theory of welfare economics can be constructed without any assumption as to the measurability of utility. This implies abstraction from considerations of income distribution. Practically speaking, any change in allocational efficiency will involve change in income distribution. New welfare eco-

2. Harrod, R.F., "Scope and Method of Economics", Economic Journal, September 1938.
3. Kaldor, N., "Welfare Propositions in Economics and Interpersonal Comparison of Utility", Economic Journal, September 1939.

nomics has shown that these two facets of welfare can be segregated and an economist is in a position to prescribe about efficiency of the economy, without entering into distributive considerations.

In the new system, utility as an ordinal magnitude replaces utility as a cardinal measure. This is not new; it has been seen that Pareto employed the same device. The definition of utility as a cardinal number requires the specification of utility units. The ordinal definition implies that we should be able to say, first that a given individual either prefers one combination of commodities, x , to another combination, y , or prefers y to x or that he is indifferent between the two; second, that preferences are transitive, i.e., if combination x is preferred to combination y and y is preferred to z , then x is preferred to z , and third, that the scale of preference is definite, i.e., no two indifference curves have a common point.

The importance of new welfare economics lies in a definition of optimum organization of the economic system which does not require interpersonal comparison of utility. Following Kaldor, Hicks defines an optimum organization "as one in which every individual is as well off as he can be made, subject to the condition that no reorganization permitted shall make any individual worse off".⁴ This can be further elaborated. According to the above definition, welfare increases when one or more individuals become better off and none worse off. But most of the economic policies are likely to better the conditions of some individuals, while causing injury to others. Hicks introduces in this

4. Hicks, J.R., "The Foundations of Welfare Economics", Economic Journal, December 1939.

connection the concept of compensation. A tax or bounty levied upon or paid to an individual is compensating when it leaves him in the event of an economic reorganization on the same indifference surface, he would have been on had the reorganization not occurred. With the aid of this device of compensation, a more precise definition of the optimum can be given.

"Welfare will be increased, decreased or left unchanged by a given economic reorganization depending upon whether the algebraic sum of all compensating taxes and bounties is positive, negative or zero."⁵

Therefore, an optimum organization is one in which the introduction of any change in economic policy cannot make the sum of compensating taxes net of bounties positive.

This definition of optimum, as Hicks and others point out, is not unambiguous. "There will be an indefinite number of different possible optima, distinguished from one another by differences in the distribution of social wealth."⁶ But this handicap is not decisive. The conditions of optimum can be derived from its definition. If any particular situation is not in optimum, there is a definite sense in which its efficiency can be increased; some individuals can be made better off, without causing any injury to others.

Hicks makes the important distinction between three sets of optimum conditions, namely, (1) marginal conditions, (2) stability conditions, and (3) total conditions. The last two sets of conditions are as important as the first one. These conditions have been stated by

5. Reder, M.W., Studies in the Theory of Welfare Economics, New York, Columbia University Press, 1947, p.16ff.

6. Hicks, Op.Cit.

Hicks and restated, both literally and mathematically, by a group of economists mentioned above. We shall briefly state here these three sets of conditions.

(1) Marginal conditions of optimum:

(a) The marginal rate of substitution between any two commodities must be the same for every individual who consumes both.

Allocation of commodities among consumers will not be optimal so long as any individual can improve his position by exchange with others, without making them worse off. This can be verified geometrically by taking the case of two individuals A and B and a pair of commodities X and Y. The preference maps of A and B are denoted by an increasing sequence of indifference curves I,II,III etc. and I',II',III',etc. respectively. Let us assume that A and B each possess some of both commodities X and Y. A convenient way of representing this situation in a diagram to find out what the optimum would be to place the indifference map of A on that of B with their co-ordinates reversed, so that the points of intersection of the co-ordinate axes of the two indifference systems are given by the total amount of X and Y possessed by A and B. This is shown in Figure 14.

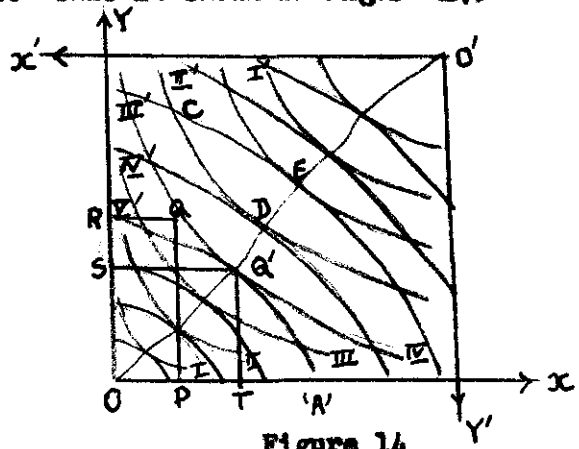


Figure 14

OM and ON are total quantities of X and Y possessed by A and B . The locus OO' of the points of tangency of the two indifference systems is known as the contract curve. It is easily seen that any combination of commodities which is not on the contract curve is not consistent with optimum and at least one of the individuals can improve his position without entailing sacrifice on the other by moving to a point on the contract curve through a process of exchange. Let Q represent the initial situation; it means that A possesses OP of X and OQ of Y and B , PM of X and QN of Y . Q lies on a point of intersection of two indifference curves of A and B , which are lower than IV and V' respectively. Both individuals will be better off by moving to the point Q' on the contract curve which lies on higher indifference curves for both of them. To arrive at the new situation, A will have to exchange RS of Y for PT of X . On analysis, it will be found that for any combination of commodities on the contract curve OO' , there are combinations of commodities on the contract curve which are optimum in the sense defined above. Thus if we consider the combination of commodities given by C in the above diagram, A and B will reach the optimum by shifting through exchange to any of the combinations of commodities represented by the segment DE on the contract curve. At the same time, it is evident that so long as we abstract from distributive considerations, there is no criterion for comparison of the different optima given by OO' . Each point on OO' is optimum in a relative sense; we have no guide according to new welfare economics of finding out the absolute maximum.

The tangency of the indifference systems of A and B implies the equation of their marginal rate of substitution between X and Y at the

In Figure 15, the two transformation curves AB and CD have been so superimposed that the total amount of X and Y produced is denoted by OM (OR by A' / RM by B') and ON (OT by A' / TN by B') respectively. It can be shown that there is no optimum when the transformation curves intersect. Let us move the transformation curve of B' to the right 'til it is tangent to the transformation curve of A'. In the new situation which is represented by the dotted lines, the production of both commodities X and Y increases by an amount MM' and NN' respectively. P is, however, only one of the many points where CD can be made tangent to AB. If we locate the origin of the dotted axes O'' at any point in the area KO''L, any common point of CD and AB will involve a greater total output of both X and Y, than if the origin were at O'. The maximum locus KO''L will evidently depend upon what combination of commodities the firms were initially producing. The optimum combination of outputs cannot be uniquely determined from this diagram alone; it merely indicates a necessary condition of the optimum. This condition is that outputs must be produced in such combinations that the slopes of the transformation curves of any two firms are equal.

(c) A third marginal condition of maximum welfare relates to optimum allocation of factors. The second marginal condition shows whether the redistribution of factors within firms will increase welfare. The third marginal condition concerns the possibility of increasing the output of any particular commodity, the quantity of other products remaining constant, through a redistribution between firms. The condition of optimum allocation of factors is that the marginal technical rate of substitution between any pair of factors must be the same for

any two firms using both to produce the same product.

A diagrammatic presentation may be given by taking the case of two firms A' and B' using two factors X and Y to produce a particular commodity. It is assumed that factors other than X and Y and the total quantity of X and Y available to the two firms are constant. On these assumptions we can draw a system of isoproduct curves for the two firms which will be convex to the origin. The familiar procedure of sitting one indifference system on another with co-ordinates reversed is also used here. The points of intersection of coordinate axes denote the total quantity of factors X and Y available to the two firms.

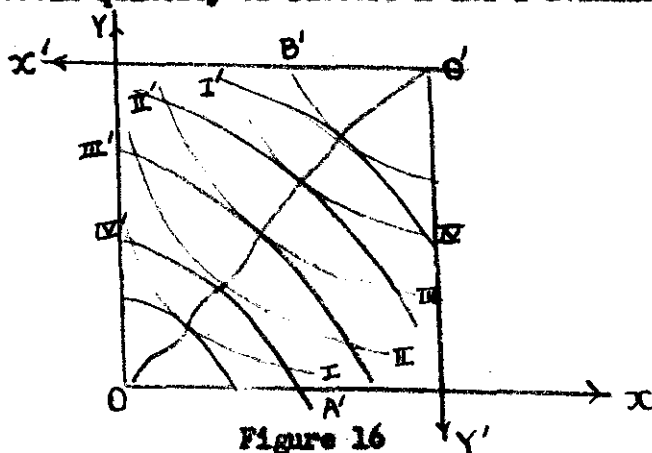


Figure 16

In Figure 16, I, II, III, ... are isoproduct curves for firm A' and I', II', III', ... for firm B'. Isoproduct curves of higher orders mean a larger quantity of product. Though these curves look like consumers' indifference curves, their import is totally different. The slope of indifference curves measures the subjective marginal rate of substitution between two commodities, while the slope of isoproduct curves relates to the marginal technical rate of substitution as determined by the technique of production. It is easily seen that the optimum

proportion of factors between the two firms is given by the locus of the points of tangency of isoproduct curves. Corresponding to any allocation of factors given by a point lying outside the locus, there will be a range of values on the locus which will increase the output of both firms or one of the firms without decreasing the output of the other firm. Since the points of tangency denote the equalization of the marginal technical rate of substitution between firms, the third condition of maximum welfare is verified.

(d) The fourth marginal condition may be termed the optimum factor product relationship. It states that the marginal rate of transformation between any factor and any product must be the same for any pair of firms using the factor and producing the product.

Let us take the case of two firms A' and B' and a variable factor X and a variable product Y . It is assumed that the total amount of products other than Y produced by each firm and factors other than X used in each firm are constant. Also the total quantity of factor X is given.

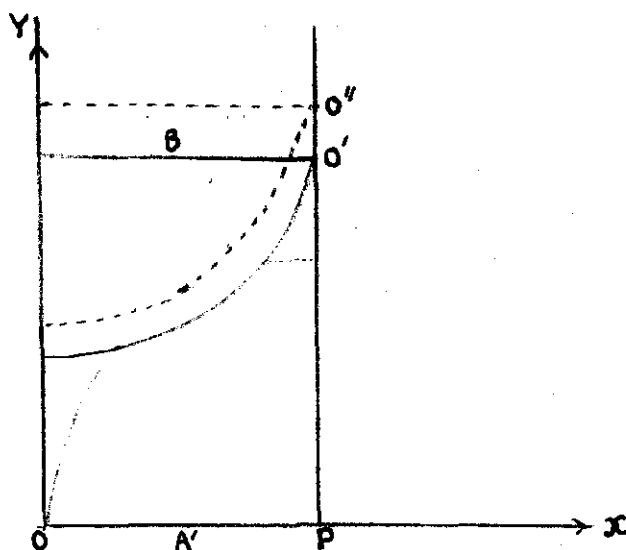


Figure 17

In Figure 17, the transformation curve of firm B' is superimposed on that of firm A' with co-ordinates reversed. The optimum will be given by reading the largest quantity of output on the Y-axis, subject to the constraint of the quantity of factor limited to OP. Obviously at the point of tangency of the two transformation curves, the largest quantity of X will be produced under the given conditions. Thus the fourth marginal condition of welfare is established.

(e) The optimum distribution of production: The first marginal condition implies that whatever is produced is distributed among consumers in the best possible way. The second, third and fourth marginal conditions specify that whatever is produced must be produced in the most efficient way. The fifth marginal condition is a synthesis of subjective and technical optima.

Supposing that all factors of production are allocated in some definite way which also determines the quantities of various commodities produced, we may construct a community transformation curve between any pair of products X and Y; this curve gives for any quantity of Y, the maximum amount of X that can be produced, given the amount of other products and the supplies of other factors. The condition of optimum direction of production is that the marginal rate of substitution between any pair of products for any person consuming both must be the same as the marginal rate of transformation for the community between them.

In Figure 18, AB is the community transformation curve. Supposing that PQ of Y and OQ of X are being produced, the marginal rate of trans-

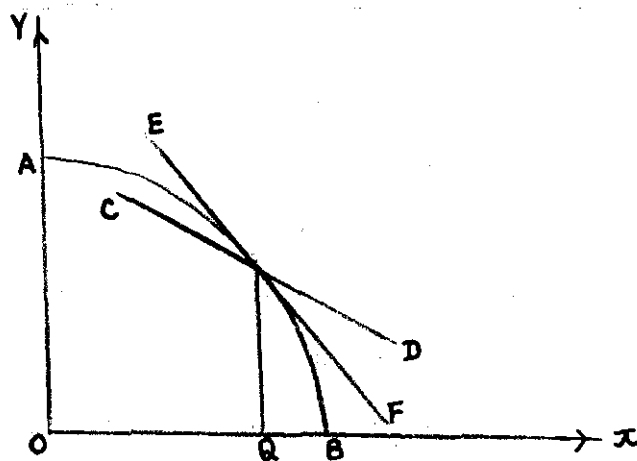
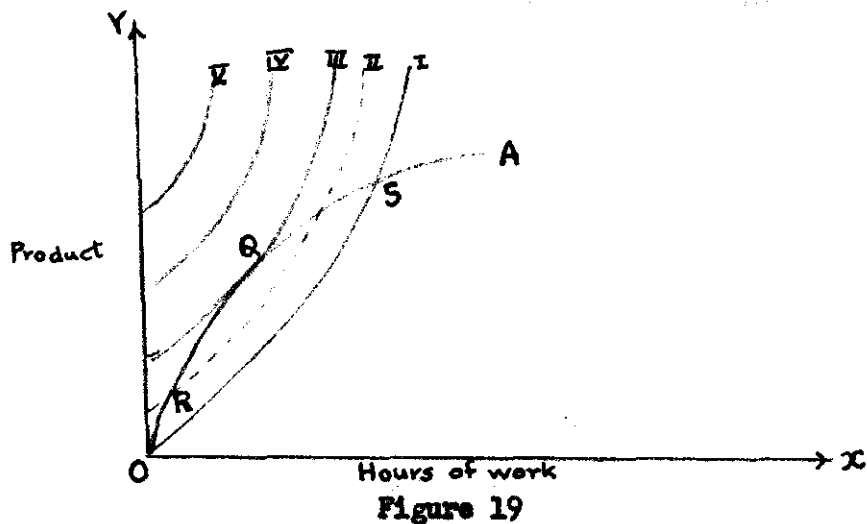


Figure 18

formation is given by the slope of the tangent EF . If a consumer allocates his resources so that his marginal rate of substitution of X for Y is given by the slope of CD , he can improve his position, without making others worse off, by substituting X for Y at a rate given by the slope of EF . When the marginal rate of substitution of any consumer is equal to marginal rate of technical transformation for the community, there is no further scope for improvement.

(f) The optimum allocation of a factor-unit's time: This refers to the allocation of time to work and leisure. For welfare to be a maximum, the marginal rate of substitution between the amount of any product received for aiding in its production and the hours spent in rendering this aid must be the same for each factor unit owner as the marginal rate of transformation between the time of his factor unit spent in aiding production and the product. In other words, the reward (in terms of numeraire) that is paid to the owner of a factor unit must be equal to the value (in terms of numeraire) of the marginal physical product of the factor unit.



In Figure 19 the curves convex to the x-axis represent an indifference map, each curve expressing the combination of hours spent by the factor unit in aiding production and the amount of reward received among which factor unit's owner is indifferent. I, II, etc. are a rising sequence of this type of indifference curves. OA is the transformation curve between hours spent by the factor unit in the production of Y and the quantity of Y produced. Optimum is indicated by the point of tangency of the transformation curve and the indifference curve of the owner of the factor unit (Q). At R, the factor unit owner will find it profitable to put in a few more hours of work and move to a higher indifference curve, for the reward it receives per unit of time is more than the reward it would require to compensate for an additional hour of work. Similarly, the owner of the factor unit, if initially confronting a situation given by S, can improve its position by working less hours and moving to the optimum point Q.

(g) Reder adds a sixth condition which relates to allocation at different points of time. Products and factors at different points of time can be regarded as different products and factors and their alloca-

tion follows the same principles as described above. So far as resource control (a fund of numeraire) which can be used to purchase goods and services) is concerned, the condition for optimum can be stated as follows. The marginal rate of substitution between resource control at any pair of moments (t_1 and t_2) is the same for every pair of individual or firms (including pairs, one member of which is a firm and the other an individual). In other words, if individual A is willing to lend \$1.0 at time t_0 for \$ 2.0 at time t_2 , and B is willing to borrow \$ 1.0 at t_0 for more than \$ 2.0 at time t_1 , both lender and borrower will benefit by carrying the transactions to the point where the marginal rate of substitution between the amount of money lent at t_0 and received at t_1 for the lender is the same as the marginal rate of substitution between the amount of money borrowed at t_0 and paid back at t_1 for the borrower.

(2) Stability conditions of optimum: The above seven conditions are necessary conditions of optimum, but not sufficient conditions. They can as well constitute conditions for minimisation of welfare unless we prescribe some second order conditions which relate to the curvature of different indifference curves. Positions where marginal conditions are satisfied will indicate maximum welfare in that neighborhood, if and only if the consumer indifference curves, iso-product curves and factor unit's indifference curve are convex to the origin, while the transformation curves and marginal productivity curve are concave to it. A less stringent condition will be that all indifference curves (including isoproduct curves) in the area be less concave to the origin than the transformation curves. The convexity of consumers'

indifference curves denote diminishing marginal rate of substitution between commodities. The concavity of transformation curves is due to the assumption that there is a diminishing marginal rate of transformation between any product and any factor - or any pair of products given the quantities of all other factors used and products produced by the given firm.

(3) Totality conditions: The function of the total conditions is to insure, Hicks observes, that no improvement can be brought about by the complete abandonment of production or consumption of some one commodity, either in one producing or consuming unit or generally; and that no improvement can be secured by the introduction of new commodities which would have been produced or consumed either partially or generally in the initial situation. Similar conditions must hold for factors. The whole set of maximum conditions may be stated in terms of total conditions.

"If welfare is to be a maximum, it must be impossible to increase it by varying the output of any product by any firm (including variations from zero); by varying the amount of any product consumed by any consumer (including variations from zero); or by varying the amount of any factor unit used to yield direct service to any individual (including variations from zero)."⁷

An optimum organization of the economy will, therefore, involve the satisfaction of all three sets of conditions. It can be shown by a couple of illustrations that these conditions may not hold simultaneously.

⁷ Rader, Op. Cit. p.38.

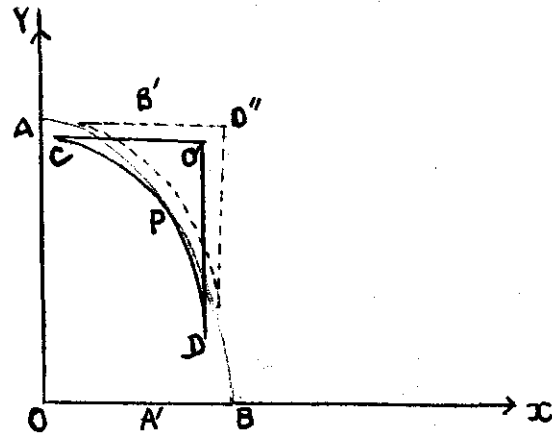


Figure 20

In Figure 20, AB and CD are transformation curves of two firms. At the point P, the marginal condition is satisfied. But it is not a stable position (the transformation curve CD being convex to the origin) as can be seen by any movement of CD to the right which increases the output of both the commodities X and Y. P does not also fulfill total conditions as evident from the dotted lines. The quantities of X and Y produced will increase from what they are at P, if the firm A' concentrates on the production of Y and B' on X.

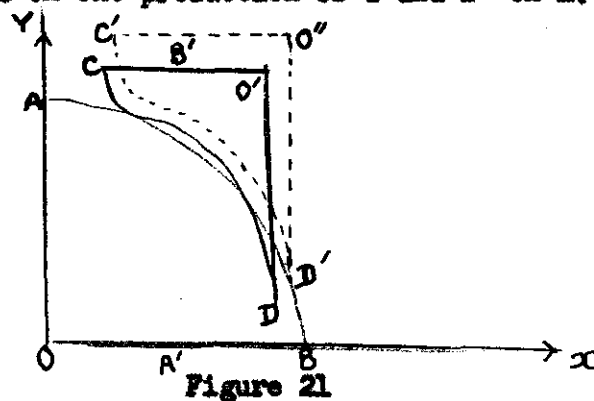


Figure 21

In Figure 21, at the point Q, both marginal and stability conditions are satisfied, but not the total conditions. From the dotted curve C'D' it is clear that output of both X and Y will increase if the firm A' produces only X and the firm B' only Y.

(II)

The conditions of optimum have been stated without any reference to the price system. We shall attempt here a brief treatment of the bearing of the price system on the conditions of maximum welfare. It is found convenient to discuss this within the framework of Lerner's⁸ schema, though essentially similar ideas have been presented by other economists of new welfare school. Lerner presents an array of five equations which can be written in the form,

$$msb = vmp = mpr = mpc = vmf = msc ,$$

where, msb = marginal social benefit, i.e., benefit to society from a particular increment of output of product considered;

vmp = value of the marginal product;

mpr = marginal private revenue, i.e., the increase in revenue received by the producer as a result of producing and selling an increment of output;

mpc = marginal private cost, i.e., increase in cost incurred by the producer as a result of increasing the quantity of factor he purchases to enable him to produce an increment of output;

vmf = value of the marginal factor. This is the physical increment of the factor of production multiplied by the price per unit paid for it and received by the owner of the factor; and

msc = marginal social cost, i.e., the sacrifice to society from having the marginal factor used up in the particular use under consideration,

⁸ Lerner, A.P., Economics of Control, The MacMillan Company, New York 1944, Ch. 6.

so that it is not available for use elsewhere. Marginal social cost of a factor in a particular use is, in other words, marginal social benefit accruing from it in other uses and can be thus regarded as social opportunity cost.

It will be seen that under certain assumptions, the above five equations are satisfied and they are perfectly consistent with the conditions of maximum welfare. Lerner also uses the equations to reveal criteria of policy under different institutional considerations. Thus in a completely centralized collectivist economy, the Ministry of Economic Planning will directly equate msb and msc by shifting resources from points where they are less useful to others where they are more useful. In a decentralized collectivist economy characterized by a free market for consumption goods, the managers of production will be required to obey the rule $vmp = waf$ and this will maximise welfare provided consumption goods are distributed optimally. In a perfectly competitive economy msb will be equalized to msc through market mechanism. In this case, the whole array of five equations become meaningful. If there is a perfect market in buying goods and the purchaser of a good is the only individual affected by the purchase, $msb = msc$. The consumers will take the prices of commodities as parameters and maximize their satisfaction by equalizing the marginal rate of substitution between any two products to their relative prices. Since the prices of commodities are the same for all individuals, their marginal substitutability between any two products will be equal in equilibrium. The second equation $vmp = mpr$ is satisfied if there is perfect competition in selling product. The average revenue curve for

the individual seller will in this case be infinitely elastic and marginal revenue will, therefore, be equal to price. $mpr = mpc$, if entrepreneurs maximize profits, as is assumed for a free enterprise economy. The fourth equation $mpc = vmf$ will follow from perfect competition in buying factors. When all these four equations are satisfied in all alternative uses of a factor, msb is equated to msc . Thus under the abstract conditions presumed to hold for perfect competition, market mechanism will lead to a maximization of welfare.

It is easy to see without further elaboration that when the prices of the products and factors are taken as parameters by all buyers and sellers engaged in transactions, the marginal conditions of welfare are satisfied through the operation of the pricing system.

One further point may be noted. It may be supposed that the proportionality of marginal cost and price (or vmf and vmp) rather than their equality is a sufficient condition for maximum welfare. Lerner⁹ argues that so long as conditions of perfect competition exist in any sector of the economy, the equality condition is necessary for the optimum. Thus, according to him, labor units are free to choose between work and leisure and they will so allot their time that the vmf of an hour devoted to work will be equal to its vmp . (This is satisfied in the sixth condition of welfare.) This implies that other vmp 's and vmf 's should be equal for optimum allocation of resources.

We shall conclude this discussion with a short note on the applicability of pricing mechanism to a socialist economy. A group of economists including F. Hayek, Von Mises¹⁰ argued that rational alloca-

9. Ibid., Ch. 9.

10. Collectivist Economic Planning, F.A.V. Hayek, Ed.

tion of resources is not feasible in a socialist economy, because of the absence of a market for capital goods.

Lange¹¹ has shown that this view depends on an extremely narrow notion of value. The value of a commodity does not depend on a money economy with the attendant facilities of exchange; it can be expressed in terms of the alternatives sacrificed so long as the commodity is scarce. Scarcity is essential for a commodity to possess some value, not the existence of the fact of actual exchange. Lange further shows that in a socialist economy, the parametric function of price can be retained and right quantity of goods can be produced by the method of trial and error.

(III)

Bergson¹² and Samuelson¹³ have probed deeper into the basic assumptions of welfare economics. In dealing with the question of welfare in its totality, Bergson introduces a social welfare function, the value of which is understood to depend on all the variables that might be considered as affecting welfare: The amount of each and every kind of good consumed by and service performed by each and every household, the amount of each and every kind of capital investment undertaken and also the various institutional factors. This is an extremely general proposition which together with the transformation function, i.e., the technological relation between input and output,

11. Lange, O. "On the Economic Theory of Socialism", in On the Economic Theory of Socialism, B. Lippincott, ed., Minneapolis, 1938.
12. Bergson, A., "A Reformulation of Certain Aspects of Welfare Economics" Quarterly Journal of Economics, Feb. 1938. See also Bergson, "Socialist Economics," in A Survey of Contemporary Economics, H. S. Ellis, Ed., The Blakiston Company, Philadelphia, 1948.
13. Samuelson, P.A., Foundations of Economic Analysis, Harvard University Press, Cambridge, 1948. Part I, Ch. VIII.

yields several welfare maximising propositions. Additional propositions are deducible on the basis of additional sets of assumptions. Without going into the details of welfare at the extremely abstract level, we shall analyse the nature of the decisions on ends which are inherent in any study of welfare economics.

One of the decisions on ends turns on whether and to what extent consumers' preferences will be respected.

"If one understands welfare to mean that consumers are sovereign, of course, the question is already decided when it is decided to maximise welfare; but obviously nothing is gained by this type of implicit theorising in which many economists seem to engage. Whether by definition or otherwise, a decision on ends must be introduced."¹⁴

Alternatives to consumers' sovereignty are likely to be overlooked in a democratic form of government, except in periods of crisis, but they are too obvious in an authoritarian set up. Thus a socialist system with a Central Planning Board may choose to ignore consumers' preferences and work on the basis of its own evaluation of what is good for the society. Staunch advocates of individualism again would not seriously propose that individual preferences are only to count without any limitations whatsoever. The importance of consumers' sovereignty is held in doubt when we consider how shaky individual preferences are. Individual tastes and wants are, to a large extent, socially conditioned by advertising and custom so that they can hardly be said to belong to him in any ultimate sense. Variants of consumers' sovereignty as important considerations in a socialist system have been the subject of serious discussion by a group of economists.

14. Bergson, A., "Socialist Economics", in A Survey of Contemporary Economics, P. 417.

It may be mentioned in this connection that once a decision has been made in favor of consumers' sovereignty, a further assumption has to be made with respect to the structure of tastes of different persons or households. The welfare analysis, as it is usually formulated, assumes that individual preferences are independent of one another; or in other words, an individual's preference depends upon what he consumes and not upon what others consume. But consumption is motivated to a great extent by conspicuous expenditure, "keeping up with the Joneses", snob appeal, maintenance of face, etc.

The second of the complex decision on ends required in any welfare study relates to the problem of distribution of income. A rational formulation of the principle depends upon the feasibility of interpersonal comparison of utility. That utilities are incommensurable is no more than an acknowledgement of the fact "that here too a decision on ends is involved. . . Ends are essentially principles for the evaluation of alternatives that otherwise are incommensurable."¹⁵ Once some principle of income distribution is hit upon, alternative means of allocating resources are evaluated in the light of that principle.

A more controversial value judgment characteristic of much modern thought, Samuelson points out is that "the welfare function is completely (or very nearly) symmetrical with respect to the consumption of all individuals."¹⁶ In other words, the comparative marginal welfare per unit of money for different persons or households would not be altered by any change in the composition of their budgets

15. Ibid. p. 418

16. Samuelson, Op. Cit., p. 224

for which their own total utilities are unchanged. It may be seen that striking differences in the preference patterns of individuals will invalidate this assumption.

From the standpoint of this approach to welfare economics, the new welfare economics is not a substitute for the old. "It is an attempt to derive necessary conditions whose validity is independent of value judgments as between individuals or more accurately whose validity depends only upon less restrictive and less well defined value judgments than had previously been assumed. It involves the implications that more goods are 'better' than less goods; (2) individual tastes are to count in the sense that it is better if all individuals are 'better off'."¹⁷

(IV)

The above discussion of new welfare economics enables us to make a few important observations. It is seen, in the first place, that both Pigou and new welfare economists provide a general welfare analysis, as distinguished from Marshall's partial welfare analysis, based on the concept of maximum welfare for the economic system as a whole. Secondly, both use the marginal apparatus to derive the conditions of general optimum.

Apart from these similarities, there is difference in approach. The new welfare economics is methodologically more stringent and logically more satisfying than Pigou's welfare economics. The rigid definition

17. Samuelson, "Further Commentary on Welfare Economics," American Economic Review, Sept. 1943.

of the optimum, distinction between necessary, sufficient and total conditions of welfare undoubtedly indicate a logical rigor which is absent in Pigou's analysis. Pigou's welfare propositions, it has been noted above, are explicitly two, one relating to allocation of resources and the other to distribution of income. That consumers reach their optimum by equating the marginal utilities of goods to their prices is implicit and never explicitly stated. Similarly the conditions of optimum efficiency in production which the new welfare economists discuss in great detail do not receive much of the attention of Pigou. Those are implied in the assumption of free competition. According to Pigou, the free play of self interest equates the value of the marginal private product of resources in different uses. This is due to the equation of factor price and the value of its marginal product as a result of competition which also ensures the fulfillment of the efficiency conditions of production.

The analysis of welfare conditions, apart from the price system is an important contribution of new welfare economics. There are two stages in the treatment of the problem. First, on the assumption that preference system of individuals, technological relation between input and output, distribution and income and quantity of ultimate factors of production are given, the conditions of maximum welfare are derived. Those conditions determine the optimum proportion of different goods to be produced, the optimum proportion of factors to be used and the optimum distribution of final goods among consumers. Secondly, the price system is introduced and it is seen that when certain assumption subsumed under the head of perfect competition are made, the marginal conditions of welfare are satisfied. Pigou's welfare propositions are derived in terms of the

price system. Kahn and Robinson, while extending Pigou's proposition to imperfect competition, use the same concepts. New Welfare economics provide a set of perfectly general propositions which are not affected by the institutional considerations which underlie the discussion of Pigou and his followers. The significance of this contribution is realised when it is seen that conditions of maximum welfare do not depend for their validity on the existence of a competitive system with the attendant facilities of exchange. In a socialist economy, where the state may have control over ultimate factors of production, optimum conditions are obtained on the imposition of a set of rules to be followed by managers of production as guides.

While the new welfare economists are logically rigorous, Pigou is more interested in the practical bearing of his conclusions. He builds up a framework with a lesser degree of abstraction and which is supposed to apply to the conditions of the real world. Thus the connotation of perfect competition is not the same with Pigou and the new welfare economists. Pigou's idea of simple competition is classical in essence. He admits the existence of various types of hindrances and frictional elements and some degree of monopoly in his competitive system. He is also an advocate of free competition in the classical sense of free enterprise. Initiative, assumption of risk, venture for experimentation which flow from private enterprise are valued by Pigou. We have seen in connection with his policy recommendations that he is reluctant to support any measure which could jeopardise those values of free competition. Perfect competition of the new welfare economies, on the other hand, is a logical construct, apart from its existence in practice. It should,

however, be noted in this connection that free enterprise of Pigou's conception does not also conform to reality. Deviation from the optimum is larger than he imagined due to imperfect competition, as shown by R. F. Kahn.

In the ideal conditions of perfect competition of Paretian and new welfare economics with perfect mobility of resources, perfect knowledge and the absence of any external economies, maximum welfare is attained. In Pigou's system, on the other hand, various types of hindrances, external economies and diseconomies, third party services or disservices lead to deviation from optimum even in a system of simple competition.

Finally, an important difference between Pigou and new welfare economists concerns the interpersonal comparison of utility. The latter group does not offer any proposition relating to distribution of income on the ground that no valid comparison between interpersonal utility can be made. Pigou's reply to the critics expressed in a recent article is instructive in this respect. He observes:

"If we take up random groups of people of the same race and brought up in the same country, we find that in many features that are comparable by objective tests, they are on the average pretty much alike and indeed for fundamental characters, we need not limit ourselves to people of the same race and country. On this basis, we are entitled, I submit, to infer by analogy that they are probably pretty much alike in other respects also. In all practical affairs, we act on that supposition. We cannot prove that it is true. Nobody can prove that anybody besides himself exists, but, nevertheless everybody is quite sure of it. We do not, in short, start from a tabula rasa, building ourselves to hold every opinion which the natural man entertains to be guilty until it is proved innocent. The burden is the other way. To deny this is to wreck, not merely welfare economics but the whole apparatus of practical thought. On the basis of analogy, observation and intercourse, interpersonal comparison can, I think properly be made; and moreover, unless we have a special reason to believe the contrary, a given amount of stuff may be presumed to yield a similar amount of satisfaction, not indeed as between any one man and any other, but as between representative

members of groups of individuals.....This is all that we need to allow this branch of welfare economics to function."¹⁸

This significantly expresses Pigou's approach to welfare economics. He states that there are many propositions which cannot be proved. Nevertheless, there are valid reasons for accepting them. The new welfare economics is concerned exclusively with allocation of resources. It cannot compare the different optima representing different income distributions.

To Pigou, this position is untenable, with the practical interest he has in welfare economics. He believes that there are grounds for comparing the utilities of different individuals and for pronouncing judgment on the distribution of income.

Use of utility as a cardinal number, however, is not essential to Pigovian system.¹⁹ What Pigou regards important is the comparison of utility both intrapersonally and interpersonally. Both these purposes are fulfilled if utility is regarded as a vector quantity and not as a scalar quantity.

The claim that new welfare economics does not involve value judgments is not justified. Bergson and Samuelson show, as we noted above, that several decisions on ends are inherent in any study of welfare economics. The sanctity of consumers' preference is one among a number of value judgments which new welfare economics makes.

On the other hand, it should be pointed out that the use of utility calculus does not really dispense with the necessity of value

18. Pigou, A. C., "Some Aspects of Welfare Economics", American Economic Review, June, 1951.

19. Pigou, OP.CIT.

judgments. There is a tone of factual validity in Pigou's treatment of welfare which may sometimes be misleading. We have seen in connection with analysing Pigou's concept of welfare that his careful analysis of the relationship between utility, desires and satisfactions imply value judgments and not factual truths. The utility calculus, in a similar way, obscure the underlying value judgments.

"While the introduction of utility calculus does not dispense with the need of value judgments, the manner in which these value judgments are introduced is a misleading one. Statements as to the aggregate character of total welfare, or as to the equality of marginal utilities when there is an unequal distribution of shares, provided temperaments are about the same, do have the ring of factual propositions and are likely to obscure the valuations implied."²⁰

20. Bergson, A., "A Reformation of Certain Aspects of Welfare Economics", Quarterly Journal of Economics, Feb., 1938.

CHAPTER VII

CONCLUSION

(I)

Pigou's welfare economics signifies the culmination of the neo-classical tradition and at the same time a departure from it. He set out writing his treatise as a time when the marginal analysis was pretty much established, though not fully developed. Pigou evidently could not accept the hypothesis which was implicit in much of the writings of English classical economists that utility or satisfaction derived from a commodity was roughly proportional to the quantity possessed by any individual. This basic postulate, which though never expressly stated explains the preoccupation of the classical economists with the dynamic problem of economic progress rather than the static problem of allocation. We have seen that free competition for the classicists was a means to widening of the economy, though in all fairness to them, it should be observed that some of them discussed free competition as a means to a tightening of the economic process.

Neo-classicists inherited from the English classical tradition this physical level of approach and never abandoned it altogether. The continental economists like Pareto, Walras, Barone, and others were interested in the allocative function of free competition on the assumption of given wants, a fixed quantity of resources and a given state of the arts. While they regarded those elements as exogenous factors, the English classicists and neo-classicists delved into a discussion of institutional, technological and other considerations

which have a bearing on those elements and tried to find out, though not too successfully the determinants of supply of labor, capital, etc.

Thus in the neo-classicists is found a mixture of both the subjective level of analysis characteristic of continental economists and the classical physical level of analysis. This was to some extent reflected in Pigou's ideas on welfare economics. We have noted above that though Pigou defined welfare in a strictly subjective sense, and analyzed the effects of distribution of resources on welfare on the assumption of full employment of a fixed quantity of resources, there are instances where he does not carry the subjective level of analysis to its logical conclusion. Those instances may be restated here. In the first place, in dealing with the problem of maintenance of capital, Pigou lays an undue stress on the constancy of its physical content and does not offer any satisfactory treatment of the factor of obsolescence which is a very important phenomenon. Secondly, on strictly theoretical considerations, aggregate national dividend consisting of consumption goods and investment goods cannot properly be regarded as an index of economic welfare in the framework of a subjective level of analysis. The relationship between consumption goods and economic welfare as revealed in subjective satisfaction is direct. On the other hand, investment goods affect economic welfare through the potentiality of their turning out consumption goods which will eventually be placed in the hands of ultimate consumers. An implicit acceptance of these two sorts of relationships as identical by Pigou prevents him from recognising their difference which is important for a proper formulation of the problem. Thirdly, Pigou's proposition that consumers derive the

same amount of satisfaction from a given quantity of goods in the future as in the present and they do not distribute resources rationally through time, is also characteristic of physical bias. Finally, Pigou deviates from the subjective level of analysis by distinguishing supply prices (supply price simpliciter and supply price from the standpoint of the community) on the basis of an imperfect criterion. By omitting any rise in factor prices from community supply price, Pigou overlooks the importance of rise in transfer earnings which enter into social cost and affect economic welfare. Only rent which does not involve any cost from the point of view of society should be excluded.

Apart from this physical substratum in Pigou's welfare analysis, some of his ideas are definitely Marshallian in character. In the first place, he takes over from Marshall the convention of drawing a boundary line between the economic and general welfare by the measuring rod of money. While admitting this boundary line, both Marshall and Pigou have analysed the interdependence of general and economic welfare, the bearing of institutional factors on economic welfare and the effects of economic causes on non-economic welfare. Secondly, the definition of economics as a science of welfare is evidently an outcome of the classical tradition. Attempt to establish economics on a sound scientific basis by avoiding implicit theorising, making basic postulates as explicit as possible and abstracting from factors, ethical, institutional or otherwise about which no valid generalisation can be made is comparatively recent in the history of economic thought. Of course, the seeds for this type of approach were sown by mathematical economists. The classicists and neo-classicists, while scientific in their approach,

did not satisfy themselves with the formulation of logically rigorous propositions. Many of their conclusions are speculative in character, based on a priori reasoning and broad psychological and sociological considerations. Pigou had this practical approach, as is to be expected of one educated and brought up in the classical tradition. Thirdly, the use of the concept of equilibrium firm and archetypal industry is similar to Marshall's use of the concept of representative firm. Both are based on a biological notion of the growth and decay of industries. Finally, utility calculus which Pigou uses is a neo-classical device. He, like Marshall, assumes that the marginal utility of money is the same for different individuals.

we can now pass on to Pigou's departure from the neo-classical tradition. In the first place, instead of Marshallian surplus analysis to analyse problems of welfare, Pigou used the marginal apparatus. While surplus analysis takes account of the total utility enjoyed or sacrificed by individuals due to the possession or non-possession of a finite quantity of goods, marginal analysis is concerned with balancing the advantages and disadvantages of very small variations in output in different industries. Pigou observes that for evaluation of welfare from different combinations of goods, aggregation of consumers' surplus is necessary. But as this is not a practicable proposition, he had recourse to the marginal analysis. By this means, Pigou deviates from Marshall's method of analysing the gain or loss of satisfaction due to different types of fiscal policy by tracing the variation of the area of consumers' surplus under a hypothetical demand curve. He argues that our knowledge of the demand curve is limited to an extremely narrow

range of output differing from the existing one by a very small variation on either side. In this case, evidently marginal analysis which is concerned with small deviations from the existing price-quantity situation promises more fruit than the surplus analysis. Secondly, Pigou derives conditions of optimum for the economic system as a whole instead of for particular sectors of the economy. While Marshall dealt with problems of welfare in the framework of a partial analysis, Pigou built up a systematic general welfare analysis centered round the concept of ideal output or optimum which requires the equality of marginal social product of resources in all uses throughout the economic system. Dealing with specific industries, Pigou is concerned with a few cases, where the automatic working of free competition does not operate toward maximum welfare. This is very similar to Marshall's partial analysis with respect to increasing and decreasing returns industries. Pigou's general approach is obscured by the assumption of the attainment of ideal output in a large body of industries due to the operation of the competitive system. The need for state interference is felt only in a few exceptional cases. The potentialities of Pigou's approach are realised in the welfare economies of Kahn and Mrs. Robinson. Kahn's analysis does not have any vestige of partial analysis; his welfare propositions are perfectly general, applicable to conditions of both perfect and monopolistic competition. The marginal apparatus of Pigou is fully developed in Mrs. Robinson's treatment of individual firms in different market situations. She studies in detail the relation between the output under monopoly, perfect competition, imperfect competition and discriminating monopoly, which were outlined

by Pigou. Marginal revenue and marginal cost are the key tools of that analysis. Pigou's conclusions gain in precision in Mrs. Robinson's analysis.

We shall end up the discussion of Pigou's vis-a-vis the classical and the neo-classical system by a short note on the conclusions derived from theoretical analysis. Divergences between private and social interest were considered in neo-classical economics; it was left to Pigou to incorporate them as particular cases in a general theory of the optimum. Thus Marshall dealt with the welfare implications of increasing and decreasing cost industries. But it was Pigou who seriously considers the divergence between private and social products arising from various possible sources. He first lay emphasis on the important type of divergence which is caused by third party services or disservices due to the application of resources in any particular use or place. The pricing mechanism under competition does not make allowance for these types of benefits or losses accruing to third parties. Pigou shows by ample illustrations that under modern industrial conditions, these divergences can assume serious proportions and unless the state attempts the correction of these maladjustments, maximum welfare, even under conditions of perfect competition will never be attained. Thus Pigou was probably the first economist to propound the economic justification for a moderate degree of socialism in a competitive system.

(II)

We shall now discuss the relation between Pigou's welfare economics and the general theory of optimum developed by Pareto and the new welfare

school. The Paretian and Pigovian systems have two common features. In the first place, both provide a general welfare analysis based on the concept of maximum welfare for the economic system as a whole. Secondly, both use the marginal apparatus to derive the conditions of general optimum.

Apart from these similarities, there is difference in approach. Pigou is more interested in the practical import of his welfare propositions than on their logical foundations. Throughout his writings, he maintains a practical interest which leaves its impact on his whole system. The Paretian and new welfare economics, on the other hand, is methodologically more stringent, while lacking in factual details. Pigou says that "it is the promise of fruit and not of light that chiefly merits our regard."¹ With Pareto, and new welfare school, the formal structure of the system is more important than the 'promise of fruit'.

The new welfare economics, we have noted above, seeks to base welfare economics on scientific foundations, free from ethical bias. Thus it reflects the utility calculus and interpersonal comparison of utility and derives optimum conditions from an apparently acceptable hypothesis as to the meaning of optimum. The correspondence of perfect competition to maximum welfare is established on the basis of an unusual degree of abstraction regarding the meaning of perfect competition. Ideal conditions of pure competition are assumed with perfect mobility and divisibility of factors and perfect knowledge. It may be said that the characteristics of perfect competition, pertaining to the general

1. Pigou, ECONOMICS OF WELFARE, 4th Ed, p. 4.

theory of optimum as developed by Pareto, Hicks and others are in the nature of deductions from the conditions of maximum welfare, rather than from observable facts.

This concept of competition is quite different from that of Pigou and other English classicists. To the classical economists, competition meant freedom of private enterprise which would prevail in real life, if there were no state interference. Free competition in this sense was meant to promote economic activity by providing sufficient incentive and initiative to produce and to experiment and by widening the area of the market by division of labor, thus absorbing new resources and technical possibilities into the economic system. Pigou does not deal with free competition as a widening mechanism, in the manner of the English classicists. He assumes the existence of a fixed quantity of resources and discusses the static problem of allocation. His idea of simple competition, however, is classical in essence. He admits the existence of various types of hindrances like costs of movement, imperfect knowledge, imperfect divisibility of factors and also a certain degree of monopoly in his competitive system. Pigou's world of competition is not an ideal system; it is believed to exist in fact. Pigou is an advocate of free competition in the classical sense of free enterprise. Even though he would plead for an equalitarian distribution of income, he wants gradualness in the transference of income from the rich to the poor and rejects any drastic measure which will prejudice private enterprise. Again, he supports indirect forms of transference in the form of lower prices of goods consumed by the poor and similar measures, so that the distribution of income does not

affect the spirit of free competition. While Pigou establishes the case for interference to mitigate divergences between marginal private and social net products, he argues that any policy adopted by the state should not hamper the smooth operation of the system of free enterprise. For this reason, most of his policy recommendations are confined to fiscal control.

Doubt may be raised about the optimum character of competition as defined by Pigou. In a system of private enterprise, imperfect competition has been recognised to be widely prevalent and the theory of value accordingly reoriented. In a world where imperfection of competition is a rule rather than an exception, and cannot be eliminated merely by abolishing the institutional restraints on the free play of self-interest, Professor Pigou's model is unrealistic. Pigou's welfare system, as we noted above, has been extended by Kahn and Mrs. Robinson to the case of monopolistic competition. While this is theoretically satisfying, the remedies suggested for the correction of maladjustments in a world of monopolistic competition become more complicated. In Pigou's system, external economies or diseconomies are in the nature of exceptions, and the same is also true of monopoly. Therefore, correction of maladjustments is necessary only in a few exceptional cases. When we take account of imperfect competition, on the other hand, divergences between private and social net products occur in the whole economic system and the scope for government interference widens. It is not at all easy to find out the average degree of monopoly and the average capacity of industries to create external economies and a calculation of the optimum rate of tax or bounty for the correction

of maladjustments in a system of monopolistic competition.

An important difference between Pigou and new welfare economists consists in their treatment of interpersonal comparison of utility. Pigou made the assumption that the marginal utility of money is the same to different individuals living in similar circumstances. This assumption, in a sense, provides another instance of Pigou's interest in the practical bearing of welfare economics. Economists are prevented from making a large number of prescriptions, if they abstract from distributive considerations. Thus according to Pareto and new welfare economics, there are multiple positions of optimum and there is no basis for comparing those different positions. Kaldor and Hicks apply the device of compensation to the notion of Paretian optimum, and extends comparability through the mechanism of compensating losers and taxing gainers. Once the status quo in the distribution of real income is attained, net gain in taxes will indicate an increase in welfare. But this really does not provide a valid criterion for practical policy. No comparison is possible between any two points on the generalised contract locus on the basis of the criterion of compensation. Pigou is primarily interested in the practical importance of his conclusions and not on their logical rigor. In order to compare different income situations, he formulates the distributional proposition which together with the allocational proposition determine the conditions of maximum welfare.

It has been said in favor of Paretian and new welfare economics that by rejecting interpersonal comparison of utility, it attains a scientific objectivity which is absent in the classical and in the

Pigovian system. Closer examination will reveal that this claim is highly dubious. Bergson's and Samuelson's study have made it clear that several decisions on ends are inherent in any study in welfare economics. In accepting the preference patterns of individuals, the new welfare economics implicitly accepts the value of consumers' sovereignty. Apart from consumers' sovereignty, there are other value propositions in new welfare economics, though it abstracts from the principle of income distribution.²

Therefore, the criticism that Pigou deviates from the disciplines of science by introducing value judgment misses the mark. On the other hand, it is important to note that conditions of maximum welfare do not require for their derivation either utility calculus or interpersonal comparison of utility. They only obscure the underlying value judgments.

The new welfare economics is undoubtedly methodologically more stringent and logically more satisfying than Pigou's system. While many of Pigou's welfare ideas are implicit and never explicitly stated, the new welfare economics offers a set of general propositions which are rigorously deduced from underlying assumptions. In doing so, it also provides a framework whose validity extends beyond price economy. Apart from this important contribution, however, there is not any substantial difference between the conclusions of Pigou and new welfare economists. As Bergson³ says, no sharp break is involved in the transition from Pigou's economics of welfare to new welfare economics; both are parts of the same process of development.

2. See Bergson, A REFORMULATION OF CERTAIN ASPECTS OF WELFARE ECONOMICS, Quarterly Journal of Economics, Feb. 1938.

3. IBID.

ABSTRACT

In Chapter I, the object of the study is outlined, followed by a discussion of Pre-Pigovian welfare economics. The purpose of our study consists in a critical analysis of Professor Pigou's welfare concept and propositions in the light of ideas held by his predecessors and successors. Pre-Pigovian welfare economics is dealt with under three different groups among which a logical classification is possible. These groups are English classical economists (A. Smith, J. B. Say, D. Ricardo, and others), continental classical economists (V. Pareto, L. Walras, E. Barone) and neo-classical economists (H. Sidgwick, A. Marshall, and others). It is shown that the English classical economists regarded free competition as a means to the widening of the economy rather than to a rational allocation of resources. The continental economists, Pareto and Barone formulated the concept of subjective optimum and dealt with the problem of allocation in the static sense. The neo-classical economists made a compromise. While accepting the doctrine of marginal utility, they were not preoccupied with the static problem of allocation. In the manner of the English classicists, they discussed the forces which govern the supply of ultimate factors of production and human wants. A typical feature of neo-classical economics is Marshall's partial surplus analysis.

In Chapter II, Pigou's concept of welfare and the problem of measurement of national dividend as an index of welfare are taken up. It is seen that Pigou arrived at the concept of national dividend

In Chapter VII, the conclusions of the thesis are presented. The similarities and contrasts between Pigou's welfare economics on the one hand and classical and neo-classical economics on the other are discussed in the first section. Points of agreement and difference between Pigou and new welfare economists are dealt with in the concluding section. It is seen that Pigou stands in between the classicists and new welfare economists. He has a practical approach characteristic of classical and neo-classical economists. On the other hand, his treatment of the concept of welfare is different from his predecessors. New welfare economics is more rigorous than Pigou's and is also more abstract. No sharp break, however, is involved in the transition from Pigovian welfare economics to new welfare economics.