

# A REVIEW OF BERGSON CRITERION AS A MEASURE OF SOCIAL WELFARE

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**Abstract:** Welfare economics has evolved during the twentieth century and came, some say, to a fateful dead end, preventing any rigorous contribution to policy recommendations. They are of the view that no meaningful propositions can be made in welfare economics without introducing value judgments. The concept of social welfare is an attempt at providing a scientifically normative study of welfare economics. This trend is standardly explained by the controversy over the possibility and the relevance of interpersonal comparisons of utility. This analysis does not provide any hope to go beyond the bad news. Moreover, it fails to explain the possibility of a new welfare economics without comparisons. Against the interpersonal comparisons reading, I claim a reasonable assumption is that under the discussion on comparisons, lies a fundamental evolution in the properties of utility. This paper presents a historical overview of the evolution of welfare economics through the XXth century, and derives a challenging explanation, the “utility reading”. It shows the evolution of welfare economics is related to the characteristics of utility, notably its operational ability and its normative content. The paper concludes that the revival of welfare economics needs a specific notion of welfare, distinct from the utility concept used in microeconomics.

**Keywords:** Welfare economics, utility, Bergson, Criterion, function.

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## 1. INTRODUCTION

### The Social Welfare Function: The Bergson Criterion:

The concept of ‘Social Welfare Function’ was propounded by A. Bergson in his article ‘A Reformulation of Certain Aspects of Welfare Economics’ in 1938. Prior to its various concepts of social welfare had been given by different welfare theorists but they failed to provide a satisfactory solution to the problem of maximisation of social welfare and measurement. Bentham talked of welfare in terms of ‘the greatest happiness of the greatest number.’

Neo-Classical welfare theorists discussed the problem of social welfare on the basis of cardinal measurability of utility and interpersonal comparison of utility. Analysis of Pareto optimality maximises social welfare by satisfying various marginal conditions of production, distribution and allocation of resources among products. But unfortunately they are not fulfilled due to the existence of various externalities and imperfections in the market. Moreover, Pareto optimality analysis fails to measure the changes in welfare resulting from any change which benefits one section of society and harms the other.

Compensation principle as given by Kaldor-Hicks-Scitovsky attempts to measure the changes in social welfare resulting from such economic changes which harm some and benefit others through hypothetical compensating payments. Compensation theorists claimed to give a value-free objective criterion based on ordinal concept of utility but, this is based upon implicit value judgements and does not evaluate changes in social welfare satisfactorily.

By providing the concept of social welfare function Bergson and Samuelson have attempted to provide a new approach to welfare economics and have succeeded in rehabilitating welfare economics. They have put forward the concept of social welfare function that considers only the ordinal preferences of individuals. They agree to Robbins’ view that interpersonal

comparison of utility involves value judgements but they assert that without making some value judgements, economists cannot evaluate the impact of changes in economic policy on social welfare. Thus, according to them, welfare economics cannot be separated from value judgements. According to them, welfare economics is essentially a normative study. But the approach to study it must be scientific despite the fact that the use of value judgements in it is unavoidable.

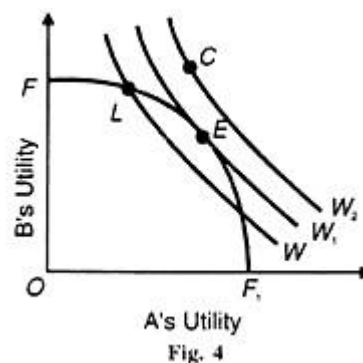
### Assumptions:

#### The Bergson social welfare function is based on certain assumptions:

- (a) It assumes that social welfare depends on each individual's wealth and income and each individual's welfare depends, in turn, on his wealth and income and on the distribution of welfare among the members of the society.
- (h) It assumes the presence of external economies and diseconomies with their consequent effects.
- (c) It is based on ordinal ranking of combinations of those variables which influence individual welfare.
- (d) Interpersonal comparisons of utility involving value judgments are freely permissible.

## 2. EXPLANATION

Given these assumptions, it is possible to depict the social welfare function on a diagram by drawing a series of 'well-behaved social indifference curves' with commodities measured along the two axes. Each indifference curve shows various distributions of utility among individuals which have the same level of social welfare. Such curves help the policy maker to find out whether a particular policy brings an improvement or not. If a change moves individuals to a higher indifference curve, social welfare is said to have increased. The social welfare function is explained diagrammatically in terms of Figure 4.  $FF_1$  is the utility frontier which represents the boundary of all utility combinations possible with the given resources of the economy. It is an envelope of a number of overlapping utility possibility curves.  $W$ ,  $W_1$  and  $W_2$  form the family of curves representing the social welfare function. Each welfare curve shows a locus of welfare combinations of the utilities of two individuals A and B who are indifferent.



Each welfare curve represents a level of social welfare. The welfare curve  $W_1$  depicts a higher level of social welfare than curve  $W$  and  $W_2$  higher level than  $W_1$ . The point of maximum social welfare or optimum position is one where the utility frontier curve  $FF$ , is tangent to the welfare curve. In the figure, point  $E$  clearly represents the situation of maximum social welfare or the bliss point. Within the constraints of given technology and fixed quantities of inputs, of all the welfare combinations open to society,  $E$  has the highest social value. Point  $i$  is on a lower welfare curve  $W$  and represents a lower level of social welfare, whereas point  $C$  on the  $W_2$  curve is beyond the utility frontier  $FF$ , of the society. Thus point  $E$  represents maximum social welfare.

### It's Criticism:

The assumptions of the Bergson criterion have tended to make the social welfare function 'as broad and empty as language itself—and as necessary,' according to Samuelson. Others have hailed it 'as a major contribution to welfare economics', while for Dr. Little, it completes the formal mathematical system of welfare economics. Scitovsky regards it as 'completely general'. Baumol judges it as 'right, not very helpful,' while to Robertson it is a 'vast partly coloured mathematical balloon'. Paul Streeten praises it as 'a device which is supposed to purify economic investigation of all vestiges of unscientific matter'. In the intermingling of these approvals and half-approvals are to be found the following limitations of these criterions.

**(1) Not Applicable either to a Totalitarian State or a Democratic One:**

The social welfare function is analogous to the individual consumer's utility function which provides a ranking-‘from the point of view of a benevolent despot, or a complete egoist, or all men of goodwill’— of alternative utility levels enjoyed by different individuals. But Little regards it as inapplicable in a totalitarian state and more so in a democratic one “where there would be as many (vague) welfare functions as there are individuals. It can be regarded only as ‘a formal device necessary to a perfectly general abstract system of welfare,’ which bears no relation to practical policy.”

**(2) Construction of Welfare Function Difficult:**

Another difficulty arises with regard to the construction and shape of the welfare function. The social welfare function is constructed by aggregating each individual's preferences. But the problem is whether individual preferences should be given equal or different weights. This makes the construction of the social welfare function a difficult task.

**(3) Arbitrary and Imaginary:**

The representation of the social welfare function in terms of either equations or social an indifference curve does not help solve the problem because individual welfare functions cannot be known. Therefore, all equations and curves representing the social welfare function are arbitrary and imaginary.

**(4) The Concept of “Maximum ‘without any Empirical Significance:**

According to Little, “The maximum is a concept without any possible empirical significance, and therefore it seems preferable not to use it. It is more meaningful to derive the ‘optimum’ conditions as sufficient conditions for an improvement with- out attempting to define a maximum position.”

**(5) Contradictory Results:**

Prof. Arrow points out that the construction of a social welfare function on the basis of ordinal preferences leads to contradictory results if individuals are required to make choices from among more than two alternatives.

**(6) Not Helpful in Solving Problems:**

According to Prof. Baumol, “The social welfare function does not come equipped with a kit and a set of instructions for collecting the welfare judgments which it requires.” Thus it is not of much help in solving the main problems of welfare economics.

**Bergson-Samuelson Social Welfare Function:**

Social welfare function is an ordinal index of society's welfare and is a function of the utility levies of all individuals constituting the society.

**Bergson-Samuelson social welfare function can be written in the following manner:**

$$W = W(U_1, U_2, U_3, \dots, U_n)$$

Where W If represents the social welfare  $U_1, U_2, U_3, \dots, U_n$  represent the ordinal utility indices of different individuals of the society. The ordinal utility index of an individual depends upon the goods and services he consumes and the magnitude and kind of the work he does. The important thing to note about social welfare function is that in its construction explicit value judgements are introduced. Value judgements determine a form of the social welfare function; with a different set of value judgements, the form of social welfare function would be different. Value judgements are essentially ethical notions which are introduced from outside economics. The value judgements required to construct a social welfare function may be obtained through democratic process with voting by individuals or it may have to be imposed on the society in a dictation manner.

Whatever the case may be, the form of social welfare function depends upon the value judgements of those who decide about them since it expresses their views regarding the effect which the utility level of each individual has on the social welfare. In the worlds of Prof. Scitovsky. “The social welfare function can be thought of as a function of each individual's welfare which in turn depends both in his personal wellbeing and on his appraisal of the distribution of welfare among all members of the community”. Since the value judgements required for the formation of social welfare function are not of the economist himself and instead they are introduced from outside economics they are not obtained through any

scientific method. It has been claimed that social welfare function has solved the basic problem of welfare economics, since it thinks unnecessary for the economists themselves to make value judgements concerning what is a desirable distribution of welfare as between individuals constituting the society. In other words, economist need not himself decide about what is the most desirable distribution of welfare. He can take value judgements regarding distribution as given from outside economics.

Bergson's social welfare function is supposed to be dependent on changes in economic events that have a direct effect on individual welfares. The ordinal utility level of an individual is a function of his own consumption of goods and services and not of others. Moreover, the utility level of an individual depends on his own value judgments regarding the composition of different goods and services consumed which depends upon his tastes. An individual may derive more utility from the consumption of liquor whereas another individual may derive very nominal utility or no utility at all from it.

### 3. SOCIAL WELFARE FUNCTION AND VALUE JUDGEMENTS

So far we have been mainly concerned with the value judgements of individuals regarding their utility levels. From the view point of social welfare function, the value judgements regarding the welfare of the society as a whole are relevant. The formulation of a welfare function for the society as a whole is a very difficult task because utility being a mental phenomenon cannot be measured or estimated accurately by any person or institution entrusted to furnish value judgements regarding the changes in social welfare. Moreover, addition and subtraction of utilities of different individuals by an authorised person or institution too is a very difficult task. The social welfare function and its form depend upon the value judgements of the person or institution that the society has authorised to decide. The authorised person or institution may be anybody but for true value judgements regarding the social welfare he must be unbiased because changes in social welfare will depend upon his value judgements.

“These judgements as to what constitute justice and virtue in distribution may be those of the economist himself or those set up by the legislature, by some other governmental authority or by some other unspecified person or group.” A social welfare function can be attained by common consensus or it may be forced upon the society by a dictator. Since the forms of social welfare functions are known by value judgements about social welfare, therefore there arises the problem of finding an authority who could give purely unbiased value judgements. Bergson and Samuelson have assumed a “Superman” who provides value judgements about changes in social welfare. Superman alone can take decisions about the solution of various problems of the economy. What goods and services should be produced and supplied in the society? How much of various goods should be produced? What should be the quality and kind of goods? What should be capital intensity of producing a particular type of good? What should be the pattern of distribution of national income among different sections of the society? Which wants should be satisfied at present and which at a future date and so on. All these questions can be answered by the superman alone in accordance with his views about the determinants of social welfare. The society would have to accept the solutions of all these questions provided by him assumption that he will give any value judgements which aim to achieve maximum social welfare rather than maximum self-interest. Thus we are free from the addition, subtraction, measurement and interpersonal comparisons of utilities by assumption the existence of a superman. In modern age of democratic governments people elect their representatives who constitute the Government. The political party in majority forms the Government and rules the country. The representatives' Government formed by the majority rule formulates various policies on the basis of value judgements and it is expected that all the policy decisions by the Government will aim at maximising social welfare rather than maximising the welfare of an individual or a particular section of the society.

Bergson and Samuelson expressed the view that all value judgements used to construct the social welfare function must be consistent which implies that if in a given situation A is preferred to B and B is preferred to C Then A must be preferred to C. This is nothing new to the students of economics as this is the well know assumption of transitivity in social choice among various alternatives. We can explain the social welfare function with the help of social indifference curves or welfare frontiers. Let us assume a society of two persons. In such a case social welfare function can be represented with the help of social indifference curves.

In Fig. 42.1 the utilities of individuals A and B have been represented on the horizontal and vertical axes respectively.  $W_1$ ,  $W_2$  and  $W_3$  are the social indifference curves representing successively higher levels of social welfare. A social indifference curve is a locus of various combinations of utilities of A and B which result in an equal level of social welfare.

The properties of social indifference curves are just like that of individual consumer's indifference curves. Given a family of social indifference curves, the effect of a proposed change in policy on social welfare can be evaluated. In terms of Fig. 42.1 any policy change that moves the economy from Q to T is an improvement.

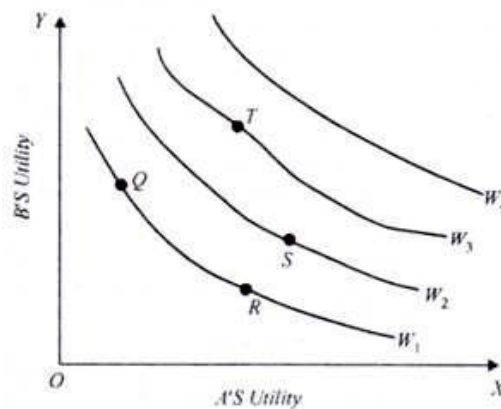


Fig. 42.1. Social Indifference Curves depicting Social Welfare Function

Similarly, a movement from Q to S or from R to S also represents an improvement in social welfare, and a movement from T to Q or T to S represents a decrease in social welfare. A movement along the same social indifference curve represents no change in the level of social welfare.

Analysis of Pareto optimality failed to provide a 'unique optimum solution' which represents maximum social welfare. There are a large number of solutions which are optimum on the basis of Pareto criterion. In terms of Edgeworth-box diagram every point on the contract curve represents the optimum position. In terms of Grand Utility Possibility Frontier, all points on it are Pareto optimal or economically efficient. But Pareto criterion does not tell us the best of them. Thus, Paretian analysis leaves us with a lot of indeterminacy in the choice of maximum social welfare point. Now, the significance of social welfare function is that it enables us to obtain a unique optimum position regarding social welfare. This unique optimum position is best of all the Pareto optima and therefore ensures the maximum social welfare. By including the concept of grand utility possibility frontier along with Bergson-Samuleson social welfare function we are able to obtain a unique optimum position or maximum social welfare position which is explained below.

#### Grand Utility Possibility Frontier and Position of Constrained Bliss:

As shall be explained below, a grand utility possibility frontier is a locus of the various physically attainable utility combinations of two persons when the factor endowments, state of technology and preference orders of the individuals are given. In other words, every point on the grand utility possibility curve represents the optimum position with regard to the allocation of the products among the consumers, allocation of factors among different products and the direction of production. Thus every point on the grand utility possibility curve represents a Pareto optimum and as we move from one point to another on it the utility of one individual increases while that of the other falls.

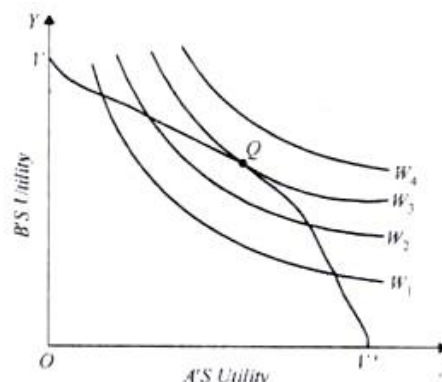


Fig. 42.2. Social Welfare Function and Position of Constrained Bliss

Now, let us superimpose grand utility possibility curve on the social indifference curves representing social welfare function to find a unique optimum position of social welfare. In Fig. 42.2 social indifference curves  $W_1$ ,  $W_2$ ,  $W_3$  and  $W_4$  representing the social welfare function have been drawn along with the grand utility possibility curve  $VV'$ .

Social indifference curve  $W_3$  is tangent to the grand utility possibility curve  $VV'$  at point Q. Thus, point Q represents the maximum possible social welfare given the factor endowments, state of technology and preference scales of the individuals. Point Q is known as the point of constrained bliss since, given the constraints regarding factor endowments and the state of technology, Q is the highest possible state of social welfare which the society can attain. Social welfare represented by the social indifference curve  $W_4$  is higher than social indifference curve  $W_3$  passing through Q but it is not possible to attain it, given the technology and factor endowment. Thus, from among a large number of Pareto optimum points on the grand utility possibility curve, we have a unique optimum point Q at which the social welfare is the maximum. The point of constrained bliss represents the unique pattern of production of goods, unique distribution of goods between the individuals and unique combination of factors employed to produce the goods.

**The following features of the Bergson-Samuelson Social Welfare function are worth noting:**

1. The Bergson-Samuelson social welfare function is based on explicit value judgements and involves interpersonal comparisons of utility in ordinal terms.
2. Bergson-Samuelson social welfare function, the maximum social welfare position is completely determined as a result of the introduction of value judgements regarding distribution of welfare among individuals.
3. The social welfare function is not based on any unique value judgements. Instead, any set of value judgements can be used by a welfare economist to construct a social welfare function. Thus, it is not any unique function but changes with the change in value judgements.
4. Once the social welfare function has been decided upon by value judgements, the maximisation technique is used to obtain the maximum social welfare position at which allocation of resources is Pareto optimum and also the distribution of goods and services is equitable. Thus, both efficiency and equity are achieved so that social welfare may be maximised.
5. Used along with the Pareto optimality analysis the concept of social welfare function enables us to find a unique optimum solution which combines economic efficiency with distributive justice.

**A Critical Evaluation of Bergson-Samuelson Social Welfare Function:**

The main aim of welfare economics has been to find an acceptable social welfare function which could measure the changes in social welfare resulting from a change in economic and non-economic variables. Bergson and Samuelson solved this problem by formulating a social welfare function which is based on explicit value judgements.

This function can incorporate the various economic and non-economic determinants of the welfare of individuals. In this function utility or welfare is conceived and measured in ordinal terms. Preferences or utilities of different individuals of the society and decisions about them are taken through a democratic method or by an authorised institution on the basis of its own value judgements. Even according to its bitter critic Little, the concept of social welfare function is a brilliant theoretical construct which completes the formal mathematical system of welfare economics. Pareto optimality analysis does not help us in providing a unique solution to the problem of maximising social welfare. As seen above, with the help of social welfare function we can measure the changes in social welfare even when one individual becomes better off and another worse off by making some distributional value judgements in the form of social welfare function.

The Bergson-Samuelson's social welfare function incorporating explicit value judgements is an improvement over earlier attempts such as compensation principle advanced by Kaldor, Hicks and Scitovsky. However, economists have pointed out some important drawbacks in the concept of social welfare function.

**Limited Practical Significance:**

Little, Streeten and Baumol have pointed out that social welfare function is of limited practical significance. According to Little, the social welfare function can neither be used in a democratic state, nor even in a totalitarian one because in them there would be as many vague social welfare functions as there are individuals. Social welfare function, to quote Little is only "a formal device necessary to a perfectly general abstract system of 'welfare', which is devoid of any practical significance. "Likewise Type equation here., Paul Streeten also thinks that social welfare function is a highly formal

concept which has hardly any relation with the important facts of social life and choice. To quote him, “No political programme or individual value standard would fit the model of a social welfare function of the required type” Prof. Baumol is also of the opinion that the concept of social welfare is of limited practical value as it does not tell us how to get the value judgements which it requires for its construction. Though Bergson criterion of social welfare function, writes Baumol, “provides us with a highly useful frame of reference, unfortunately it does not come equipped with a kit and a set of instructions for collecting the welfare judgements which it requires. Thus it still leaves us with the difficult part of the job unsolved”

Welfare depends on a wider range of variables than those associated with utility. Social welfare function approach is based on the utility which an individual derives from economic variables such as consumption of goods and services. Apart from these economic variables, welfare or well-being of individuals depends on a whole range of political and environmental variables such as enjoyment of human rights, political freedom, pollution-free environment.

Thus, “in comparing different economic systems or in comparing different ways of organising a given economy, the possibility that some of these variables might be affected cannot be ignored. Thus a reorganisation that gives everyone more income and leisure might not improve the welfare of the community if at the same time it limits individual freedom or requires the abandonment of cherished cultural traditions.”

#### **Impossibility of Constructing a Social Welfare Function from Individual Preferences:**

A highly damaging drawback of social welfare function has been pointed out by K.J. Arrow who has shown that social welfare function cannot be constructed on the basis of value judgements arrived at through democratic process of majority rule in group decision-making.

Arrow has proved that the majority rule leads to contradictory results or intransitivity of social choices when individuals are asked to make a choice from among more than two alternatives available to them. Therefore, Prof. Arrow concludes that a social welfare function which is based on mere ordinal preferences cannot in principle be constructed from the preferences of all the individuals comprising a society. Of course, social welfare function can be set up on the basis of value judgements of an individual who can impose his will on the society but that will reflect the aims and aspirations of an absolute dictator.

#### **Prof. Amartya Sen’s Critique: Judging welfare or well-being in terms of utility is of limited significance:**

Prof. Amartya Sen has criticised modern welfare economics convening both Pareto efficiency and social welfare function on the ground that utility is not a true indicator of well-being. To quote him, “A difficulty with welfarism arises from the particular interpretation of well-being that utility provides. To judge, the well-being of a person exclusively in the metric of happiness or desire-fulfilment has some obvious limitations. These limitations are particularly damaging in the context of interpersonal comparisons. of well-being.” He further adds, “A person who has had a life of misfortune, with very little opportunities, and rather little hope, may be more easily reconciled to deprivations than others reared in more fortunate and affluent circumstances. The metric of happiness may, therefore, distort the extent of deprivation, in a specific and biased way. The hopeless beggar, the precarious landless labourer, the dominated housewife, the hardened unemployed or the over-exhausted coolie may all take pleasures in small mercies and manage to suppress intense suffering for the necessity of continuing survival, but it would be ethically deeply mistaken to attach a correspondingly small value to the loss of their well-being because of the survival strategy”.

It follows from above that Amartya Sen has criticised the concept of social welfare based on utility which means psychological reactions of individuals to goods and services which they consume. Further, Prof. Sen shifts the focus on promoting positive freedoms of individuals for assessing the change in their welfare following a change in organisation or public policy. He defines freedom as ‘capabilities to function’ as to what persons can do or cannot do. It is capabilities to function that reflect freedom in the positive sense and determine well-being or welfare of the people.

#### **4. CONCLUSION**

The concept of social welfare function was first introduced by Prof. Bergson and later on developed by Samuelson, Tintner and Arrow. A social welfare function shows the factors on which the welfare of a society is supposed to depend. Bergson defines it “as a function either of the welfare of each member of the community or of the quantities of products consumed and services rendered by each member of the community.” In its original form the Bergson social welfare

function is formulated in a completely general manner. It is a function which establishes a relation between social welfare and all possible variables which affect each individual's welfare, such as a services and consumption of each individual. The general properties of the social welfare function are similar to those of an individual utility function. In particular, the value of the welfare index increases whenever the utility level of one individual is increased without lowering that of the other individual. Thus the social welfare function is consistent with the Pareto optimality criterion, but it goes much further, since it assigns a value to every economic state, including those which according to the Pareto criterion are regarded as non-comparable. The existence of a social welfare function, therefore, implies a comparison of the welfare position of the individual members of society.

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