Social Welfare Function of Economics (With Diagram)

In welfare economics, a **social welfare function** is a function that ranks social states (alternative complete descriptions of the society) as less desirable, more desirable, or indifferent for every possible pair of social states. Inputs of the function include any variables considered to affect the economic welfare of a society.[1] In using welfare measures of persons in the society as inputs, the social welfare function is individualistic in form. One use of a social welfare function is to represent prospective patterns of collective choice as to alternative social states. The social welfare function provides the government with a simple guideline for achieving the optimal distribution of income.[2]

The social welfare function is analogous to the consumer theory of indifference-curve–budget constraint tangency for an individual, except that the social welfare function is a mapping of individual preferences or judgments of everyone in the society as to collective choices, which apply to all, whatever individual preferences are for (variable) constraints on factors of production. One point of a social welfare function is to determine how close the analogy is to an ordinal utility function for an individual with at least minimal restrictions suggested by welfare economics, including constraints on the number of factors of production.

There are two major distinct but related types of social welfare functions:

- A **Bergson–Samuelson social welfare function** considers welfare for a *given set* of individual preferences or welfare rankings.
- An **Arrow social welfare function** considers welfare across *different possible sets* of individual preferences or welfare rankings and seemingly reasonable axioms that constrain the function.[3]

Bergson–Samuelson social welfare function[edit]

In a 1938 article, Abram Bergson introduced the *social welfare function*. The object was "to state in precise form the value judgments required for the derivation of the conditions of maximum economic welfare" set out by earlier writers, including Marshall and Pigou, Pareto and Barone, and Lerner. The function was real-valued and differentiable. It was specified to describe the society as a whole. Arguments of the function included the quantities of different commodities produced and consumed and of resources used in producing different commodities, including labor.

Necessary general conditions are that at the maximum value of the function:

- The marginal "dollar's worth" of welfare is equal for each individual and for each commodity
- The marginal "diswelfare" of each "dollar's worth" of labor is equal for each commodity produced of each labor supplier
- The marginal "dollar" cost of each unit of resources is equal to the marginal value productivity for each commodity.

Bergson showed how welfare economics could describe a standard of economic efficiency despite dispensing with *interpersonally-comparable* cardinal utility, the hypothesization of which may merely conceal value judgments, and purely subjective ones at that.