Utilitarianism With Maximin Provision

by

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Abstract

Utilitarianism has been faulted over the issue of interpersonal comparisons. They can't be amalgamated due to the fact that "every mind is inscrutable to every other mind." Rather than try to compare cardinal measurements, we take the view of considering them all as equal inputs to a social choice system, and then applying a maximin condition at the output so that every participant has at least a minimum amount of utility in the final result.

Introduction

In Social Choice and Individual Value, Arrow states: “The viewpoint will be taken here that interpersonal comparison of utilities has no meaning and, in fact, that there is no meaning relevant to welfare comparisons in the measurability of individual utility.” Thus, according to Arrow, any individual input must be based on individual preference rankings of the form $aR_ibR_ic...$, meaning *a* is preferred or indifferent to *b*, *b* is preferred or indifferent to *c* etc. The subscript i refers to the i^{th} individual chooser. The social choice then would be aRbRc... . Thus, according to Arrow, all inputs must be of an equivalent nature. Utilitarian inputs would be in the form of utility profiles such that each alternative would be specified as a point on the real line R^+. $U_i = \{u_1, u_2, ..., u_n\}$where u_1 is the utility of candidate or alternative 1, u_2 is the utility of candidate or alternative 2 etc. Each individual i would be free to express their utilities in any way they see fit including choosing the end points of their chosen scale. There need not be a candidate or alternative at either end point.

Sen has expressed this form of utility as cardinal non-comparability. Each utility can be changed by a positive affine transformation such that the relative positions of the utilities stay the same. f(u) = au + b. Therefore, each individual set of utilities could be transformed so that they were all expressed on a scale with 0 and 1 as end points, for example. This does not mean that a utility of 1, for example, has the same meaning for individual chooser A as it does for individual chooser B. What it does mean is that we are equalizng all the inputs to the social choice function just as Arrow did when he chose inputs of the form $aR_ibR_ic...$.

Therefore, the utilities for the candidates can be added over all choosers, and the output of the social choice will consist of real numbers which represent a ranking of candidates. Th one with the largest amount of cumulative utility will be the winner or a winning set of size *m* can be composed of the *m* highest rankings.

The issue of strategic voting is relevant since, instead of voter/choosers listing their sincere utilities for each alternative/candidate, they could represent their inputs strategically. This is true of almost any voting/choosing system including those which simply rank the alternatives as Arrow suggests. In order to adjust the outcome of the social choice process by using a maximin provision to raise those with the lowest utilities to an acceptable level, it is important to know the sincere utilities of each participant at the input. One way for the voter/choosers to vote/choose insincerely in such a way as to get an outcome more in their favor is to raise certain alternatives, the ones most highly favored to the maximum input value of "1" and to decrease the submitted utilities of the ones least favored to "0". If the social choice is based on a distorted set of inputs, employing a maximin condition at the output doesn't make much sense.

However, if the social choice mechanism or function itself converts each individual input to the best strategic input prior to processing it to determine the social choice outcome, then the individual voter/choosers have no incentive to submit strategic inputs, and will, therefore, vote/choose sincerely. Lehtinen (2015: p.35) has shown that "strategic behavior increases the frequency with which the *utilitarian winner* is chosen compared to sincere behavior ". The utilitarian winner is the one that maximizes the social utility of the social choice or in other words achieves the utilitarian ideal, "the greatest good for the greatest number" although this ideal is alterd somewhat here to be "the greatest good with everyone having at least a minimum of utility". Therefore, if every voter/chooser votes strategically in the maximal way or, if this is done for them by the system itself, the result should be the utilitarian winner. The Optimal Threshold Mechanism (Lawrence, 2025) processes the inputs in such a way as to give each input strategically the best result in the outcome of the social choice. This system accomplishes two things: it produces the utiliarian winner and it incentivizes each participant to vote/choose sincerely. Also, the individual output results can be computed

for each participant since their sincere input utilities are known.

Therefore, when the maximin ondition is applied to the social choice result which produces the utilitarian winner, it is being applied to the system which produces the greatest social utility and not to a result of less than maximum or distorted social utility. The maximin condition can be applied in a number of ways. A minimum utility level for each participant can be set, and then the winner or winners in the outcome of the election/social choice can be altered so as to elevate those with the minimum utility to an acceptable level. A computer program (AI perhaps?) can accomplish this so as to reduce the social choice by the least amount while accomplishing the minimax condition.

Summary and Conclusions

We choose a utilitarian system in which all inputs are expressed on the real line between "0" and "1" by means of an affine linear transformation. They are, therefore, equalized similarly to the "one man, one vote" structure which is typical of all voting systems. Then the social choice mechanism itself alters each vote strategically so as to maximize that voter's utility in the outcome of the social choice process. As a result of the system's maximizing the power of each choice/vote strategically, there is no incentive for the individual voter/choosers to do so. In fact their alteration of their sincere utilities might give them a less favorable outcome. The output of the system or social welfare function produces the utilitarian winner(s) which is the winner(s) which maximize social utility. Since we know at the output the sincere utilities of each individual participant, we can comput the utilities of each voter/chooser at the output. Then a maximin condition can be applied so as to reduce the utility of the social choice by the least amount in order that every participant has at least a minimum amount of utility.

The Optimal Threshold Mechanism results in the following: (1) sincere input of utilities by all participants; (2) the utilitarian winner(s); (3) the utilities of the social choice for society as a whole and for each individual participant; (4) the possibility of a maximin condition which raises the utilities of those with the lowest outcome utilities to a minimum level while lowering the utility of the social choice by the least amount.

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