

Direct Democracy and Preference Aggregation: the problem of long term effects decisions.

I. Introduction.

As Aristotle has said: “Democracy is the less imperfect attainable form of government”. However it has some fails. One of the most known is that in some cases it does not take into account the preferences of some individuals who are affected by a decision. A clear example of it is when a society is deciding whatever that concerns the environmental preservation. In this case democracy is taking into account the preferences of all the individuals that live in the present, but not the unborn future generations which obviously have no possibility to vote. Moreover the omitted preferences of these individuals would be probably very different from the ones of the existing individuals, in the sense that they will be much more interested in preserving natural resources.

This issue could be seen as a case of a more general fail about evaluation of long term projects, see Broome (1992) or Price (1993). Still being more general we could integrate this problem in the context of externalities since we are dealing with the action of some individuals that affects the welfare of some other not involved directly in that action. But since we are dealing with a collective decision, here we adopt a different framework than the usual one in externalities, by concentrating on preference aggregation.

It exist a broad literature in Social Choice Theory related with this issue, concerned with the concept of intergenerational justice (Asheim, J. B., 1991; Asheim, Mitra and Tungaden, 2006). Here we concentrate on the failing in direct democracy to aggregating preferences that also concerns future individuals, using social choice theory to explain it. What we want to do is the description this fail using Social Choice theory. To do so

we consider direct democracy with majority voting¹ and show that although this could be a desirable preferences aggregator for a 2 alternatives decision that just concerns today voting generations, this is not so when we deal with a decision that also affects future generations.

It could exist some controversy about the rights of the unborn people and why we should be interested in taking them into account but we leave this debate for the justice philosophers and we will only concentrate on the fact that we are dealing with some decisions that affect a large group of individuals and therefore our interest may be to see what happens when we include the preferences of all these affected individuals in the domain of the social welfare aggregator.

Then once presented the social choice formulation to this problem we analyze some of the solutions that we can find to solve it. We recognize that social welfare aggregators are a good way to explain the problem we are presenting here, but then we need to move to a more relaxed way of aggregating preferences in order to be able to propose some solutions. Then we will use social choice functions in order to study possible ways of solving it.

II. Social choice and decisions that affects future generations

We have a set \mathcal{J} of individuals affected by some decision, $\mathcal{J} = 1, \dots, I$

Consider that we have to decide between 2 alternatives x and y , we can interpret them as:

x : Reduce CO2 emissions.

y : maintain the actual emissions' level

We can represent preferences as:

$$\alpha_i = \begin{cases} 1 & \text{iff } x \succ y \\ 0 & \text{iff } x \sim y \\ -1 & \text{iff } x \prec y \end{cases}$$

Then we can define a preference profile as a vector: $(\alpha_1, \dots, \alpha_I)$.

A social welfare aggregator is a rule that assigns a social preference value to every possible preferences profile, that is:

$$F : (\alpha_1, \dots, \alpha_I) \longrightarrow \alpha$$

¹ When we talk about direct democracy with majority voting we refer to a process in which all existing individuals (above some age, mental capacities...) in the society have the right to vote about a determined issue, in social choice terms this is more related with the idea of social choice functions. We use majority voting rule to refer to a type of social welfare aggregator.

We define the majority voting rule as:

$$F(\alpha_1, \dots, \alpha_I) = \begin{cases} 1 & \text{if } \sum \alpha_i \beta_i > 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, I \\ 0 & \text{if } \sum \alpha_i \beta_i = 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, I \\ -1 & \text{if } \sum \alpha_i \beta_i < 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, I \end{cases}$$

Notice that applying majority voting in a direct democracy system for a two alternatives decision that only concerns today voters we will be applying exactly this social choice definition of majority voting rule². Then by May's theorem (May K. O. , 1952) in this case we have a Pareto efficient, symmetric, neutral and positive responsive social welfare aggregator. But considering majority voting for a decisions that not only affects today voters but also future generations then by using direct democracy with a voting system in which all today existing voters have the same weight we are not applying the previous definition of majority voting. Instead of it we are using what we can call present generation majority rule:

$$F(\alpha_1, \dots, \alpha_I) = \begin{cases} 1 & \text{if } \sum \alpha_i \beta_i > 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, h \text{ and } \beta_i = 0 \text{ for } i=h, \dots, I \\ 0 & \text{if } \sum \alpha_i \beta_i = 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, h \text{ and } \beta_i = 0 \text{ for } i=h, \dots, I \\ -1 & \text{if } \sum \alpha_i \beta_i < 0 \text{ with } \beta_i = 1 \text{ for } i=1, \dots, h \text{ and } \beta_i = 0 \text{ for } i=h, \dots, I \end{cases}$$

Here we use the sub-indexes 1 to h to represent the present generation voters and from h+1 to I for future generations. Observe that when we deal with a decision that also affects future generations and we include them in the domain of the social welfare aggregator we are not applying majority voting rule but the present generation majority voting rule. Then we can no longer apply May's theorem to this type of decisions although being using majority voting in the sense that all preferences of today voters have the same weights. We do not have longer a symmetric, neutral and positive responsiveness social welfare aggregator (by May's theorem the only social welfare aggregator that satisfies this is the majority voting rule). Hence we can interpret the problem of not taking into account future generations opinion when aggregating preferences for an issue that concerns them, as the problem of having abandoned the majority voting rule in the social choice theory terms.

III. Possible solutions.

Social welfare aggregators are a good way to explain the problem we are presenting here, but then we need to move to a more relaxed way of aggregating preferences in order to be able to propose some solutions for this particular fail in democracy. Then we will use social choice function in order to study possible ways to solve it.

² Note that although strictly speaking majority voting in direct democracy is not a social welfare aggregator but it is a social choice function we can make this identification because we are dealing with the two alternatives case.

From the social choice theory analysis we found that in the case of democracy we can see this as a problem of being deviating from the strict definition that we give to the majority voting rule. In this sense social welfare aggregators are very useful to show the problem we are dealing with but it is unfeasible to use it to find the solution to this problem. More precisely since any decision regarding how to take into account future generations will be taken only by today existing individuals it will not respect the properties of positives responsiveness and symmetry. However we can look for a solution that although not including future generations preferences in the social welfare aggregator could give a similar outcome as the one preferred by a social welfare aggregator that includes them. That is to find a solution to this problem we will abandon the above mentioned desirable properties of social welfare aggregator in order to concentrate on social choice function³ that gives an outcome more similar to the one we would obtain by including future generations preferences. That is we will not solve the problem of not having a symmetric and neutral positive responsive social welfare aggregator but we will concentrate on obtaining the outcome that we will have as the preferred by a social welfare aggregator that satisfies these properties.

We will not enter in the discussion about how to know the preference of the unborn people, we will just consider similar cases as the one of the example proposed before, for which future generations' preferences are more concerned with one of the options than it is for the present voters. This is because of the fact that the decision of maintaining the pollution level can have some benefit for today voters but no one for future generations. It could happen that preferences were affected by the process of socialization of individuals, and that could imply that preferences change over different generations, moving for example to a more environmental concerned inclinations. However this does not eliminate the possible appearance of the problem once the today unborn generations can vote, again it would exist a potential problem when aggregating preferences using only vote of today individuals because of the difference between their preferences and those of the next generations, as a consequence of the fact that future generations will only face a cost while the voting ones could obtain some benefits from not being very careful with the environment.

First solution: Changing weights in voting in direct democracy:

Then our first way of trying to solve the problem to change the weights in the social choice function in order to make more likely the result that will be obtained by considering both preferences of present and future generations. One way of doing this in a voting system is by giving more weight to those people more concerned with the

³We define a social choice function as:

$$f: (\alpha_1, \dots, \alpha_n) \rightarrow (x, y)$$

that is now, the set of images are the outcomes instead of social preferences.

welfare of future generations, as for example those with children. Then, following the previous notation, we will create a Social Choice Function of the following form:

$$f(\alpha_1, \dots, \alpha_l) = \begin{cases} x & \text{if } \sum \alpha_i \beta_i \geq 0 \text{ with } \beta_i = 1.5 \text{ for voters with children and} \\ & \beta_i = 0.5 \text{ for voters without children for } i=1, \dots, h \\ y & \text{if } \sum \alpha_i \beta_i < 0 \text{ with } \beta_i = 1.5 \text{ for voters with children and} \\ & \beta_i = 0.5 \text{ for voters without children for } i=1, \dots, h \end{cases}$$

The weights in this previous example were chosen quite arbitrarily, but this is because the main objective is just to show that by this way we can use Social Choice approach to getting closer to the result that would be obtained by considering future generations' preferences.

Second solution: Representative democracy.

Another way of getting some way of generate an outcome more in accord to the one that would be obtained by considering future generations' preferences consist on moving to a representative democracy. The main argument to say that this could make an improvement with respect to direct democracy is because the politicians could be seen as a more informed agents than voters and because of the fact that under representative democracy individuals does not vote for a single issue but for some. Then it could be possible that decisions concerning environment have less importance than some others and that politicians could implement a decision more closer to the one preferred by considering future generations' preferences without a big political cost because voters are more concerned with some other issues. We see in representative democracy a possible way of solving the problem by using bundles of political issues instead of voting for single matter. Our hypothesis is that by voting about many issues it could reduce the relevance of certain issues and make possible the endorsement of some decision that present generations may not approve in case of voting them as a single issue. Another argument could be to construct a model in which the politicians presents several times to the elections, then once some of the future generations becomes a voters they may be willingness to punish the politician for having implemented some policies painful for them during their non voting age.

IV. Conclusions.

Here we have presented a fail of voting in democracy that is irreconcilable with desirability of it as a Social Welfare Aggregator. When we deal with decisions that affect not only today voters but also future generations we cannot do the analogy between majority voting with direct democracy and a Pareto efficient, symmetric, neutral and positive responsive social welfare aggregator that otherwise we can do for the two alternatives case.

Moving to Social Choice Functions we can find that the fail could be mitigated. We proposed as some possible solutions changing weights in the voting system by valuing more those individuals more concerned with future generations or moving to a representative democracy.

V. References.

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