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Condorcet Jury Theorem

Background

The CJT is located in the field of probability theory. It offers a positive motivation for majority rule besides the common normative arguments like justness, fairness and egalitarian. The CJT is dealing with the relative probability of a given group of individuals to reach the correct decision under simple majority rule.

Non-technical Meaning

The CJT states, that when the average probability of a single individual to reach a correct decisions is greater than 50%, the chance of the decision-making group as an entity to reach the correct decision is increasing with the addition of more members to that entity.

Technical Formulation

Let n voters (n odd) choose between two alternatives that have equal likelihood of bein correct a priory. Assume that voters make their judgements independently and that each has the same probalility p of being correct $(1/2 < p < 1)$. Then the probalility that the group makes the correct judgement using the simple majority rule is

$$P_n = \sum_{h=(n+1)/2}^{n} \left[n!/h!\,(n-h)!\right] p^h \,(1-p)^{n-h}\,,$$

which approaches one as n becomes large.

Example

The theorem is often used to justify direct democracy, accepting the aforementioned assumptions leads to a higher probablity of reaching the right decision. It is also used as a defense for majority rule in respect of election representatives. Assuming that all citizens want to be governed by a person of high integrity and competence, the application of the CJT supports the notion of general suffrage thus increasing n.

Reference

Mueller, D. (2003): *Public Choice III*. Cambridge University Press, Cambridge.