

Voting Power on Linear Political Space

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Abstract

In a voting game, a set of players must make a yes-or-no decision on a given issue. Players move different number of votes, e.g. weights, so that they are appointed of different "power". Classic methods to measure such power are the Shapley-Shubik and the Banzhaf indexes, that are defined on the condition that all players coalitions can form, that voters are perfectly symmetric, and that preferences about the voting issue do not play any role in the game. As a consequence, voting game and power indexes were applied only to the a-priory analysis of a legislature, for example to the abstract and theoretical power of European nations under different scenarios of votes/weights distribution.

To make the power analysis an empiric tools to analyze a real voting situation, in which players have preferences on the outcome of a negotiation, we analyze a recently proposed voting model in which players are located in a political space in correspondence to their bliss points, with more than one voters located on the same point. Then coalitions can form on the condition that voters are connected. As a result, the political space and connections can be embedded on a graph. It can be shown that the Banzhaf and Shapley-Shubik indexes can be defined in this setting and that they are computable efficiently, a.g. in pseudo-polynomial time.

The index of Banzhaf with constrained coalitions is used to analyze a data base, which describe the negotiations in European Council of the last 20 years. The data base reports the bliss point of each nations on a given negotiation, the saliency of the issue for each nation, and the outcome of the decision. Data are fitted with an econometric model that include the revised Banzhaf index, that appears to be significant under many control variables. In other words, the revised Banzhaf index is a predictive variable of the outcome of a negotiations in a realistic setting.