Non cooperative foundations of bargaining power in committees

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EXTENDED ABSTRACT

In a previous paper[1] we provided axiomatic foundations for an interpretation of the Shapley-Shubik index (and other power indices) as a measure of the 'bargaining power' (in the precise game theoretic sense) that a voting rule confers to its users in a 'bargaining committee'. That is, a committee that bargains in search of consensus over a set of feasible agreements 'in the shadow' of a voting rule. Thus the model consists of the voting rule W that prescribes what coalitions have the capacity to enforce agreements, and the set of feasible payoffs associated with the feasible agreements D along with the payoffs corresponding to the status quo d. In this setting, assuming some 'rationality' conditions à la Nash (efficiency, anonymity, null-player, independence of irrelevant alternatives, and invariance with respect to positive transformations) a family of solutions was characterized. Namely

$$\Phi(B, W) = Nash^{\varphi(W)}(B), \tag{1}$$

where $B = (D, d)$ is the underlying bargaining problem (in the classical sense), and $\varphi(W)$ is an anonymous function of the rule that assigns zero to null players. In words, the solutions obtained are the *weighted* Nash's bargaining solutions of B with weights (i.e., 'bargaining powers') given by $\varphi(W)$. A characterization was also given of the special case

$$\Phi(B, W) = Nash^{Sh(W)}(B), \tag{2}$$

where $Sh(W)$ denotes the Shapley-Shubik index of voting rule W.

In this paper we explore the non cooperative foundations of these results. We use as primitives the same ingredients as in the previous model: W and B. In this setting, assuming complete information, we model a variety of noncooperative bargaining processes, that provide non cooperative foundations for the previous results, which appear in this light as limit cases.

The basic idea for these bargaining 'protocols' is the following: A player, with the support of a 'winning' coalition to play the role of proposer, makes a proposal that if it is accepted ends the negotiations. If some player rejects it, then with some probability negotiation ends in a failure, otherwise a new proposer and a winning coalition supporting him/her are chosen. Thus the negotiating process ends either when a proposal is accepted or, if failure occurs, in the status quo. Alternatively, instead of breakdown we consider the case in which with some probability 'rejecters' are dropped out of the game. As use to be the case, all depends on the way the proposer and the supporting coalition are chosen. In particular this model accounts for the non-uniqueness of the answer provided by (1). Different specifications of the bargaining 'protocol' yield different outcomes. A stationary subgame perfect equilibrium is proved to exist for a variety of protocols, which in the limit, when the probability of failure tends to zero, approach the different solutions given by (1). As to the particular case of (2) it appears as a special case with a sort of 'focal' appeal by virtue of the simplicity of the particular associated protocol that confers it some normative value as a term of reference.

[1]"Bargaining in Committees as an Extension of Nash's Bargaining Theory", forthcoming in Journal of Economic Theory.