

Generalization and modifications of the Hoede-mailBakker index
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KeyWords: Hoede-mailBakker index, inclination vector, group decision, Penrose measure, Coleman indices, Rae index, König-Brauninger index

ABSTRACT

The paper concerns the Hoede-mailBakker index (1982). This index takes the inclinations of the players into account, as well as the social structure in which players may influence each other. The essential point of the Hoede-mailBakker index is the distinction between the inclination (to say “yes” or “no”) and the final decision (apparent in a vote). In this paper, we present a generalization suggested by Moshe Machover and several modifications of the Hoede-mailBakker index, which happen to coincide with some other power indices. In order to show the relation between the generalized or the modified Hoede-mailBakker index and the other power indices, we use the probabilistic approach.

First of all, we generalize the Hoede-mailBakker index by removing one of the assumptions adopted in the original definition, according to which changing all inclinations of the players leads to the opposite group decision. By resigning from this requirement, the applicability of the index is extended. We present several examples showing the usefulness of such a generalization. In particular, the generalized Hoede-mailBakker index may be applied to a game with a vetoer. Moreover, we allow the ability to influence others to depend on the inclination. In such situations we cannot apply the original Hoede-mailBakker index, since one of the axioms adopted by Hoede and Bakker (1982), that is, the axiom mentioned above, is not satisfied. With the new set of axioms and the generalized definition of the Hoede-mailBakker index, it is possible to analyse such situations. The generalized Hoede-mailBakker index happens to coincide with the Penrose measure.

In this paper, also several modifications of the Hoede-mailBakker index are introduced. Given a group decision, we may count, for instance, all the inclination vectors leading to a positive group decision. This modification leads to Coleman’s “power of a collectivity to act”. Other modifications introduced in this paper coincide with Coleman’s index “to prevent action”, Coleman’s index “to initiate action”, the Rae index, and the König-Brauninger index.

References

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