

# COMPARISON BETWEEN DIFFERENT APPROACHES TO THE NORMALIZED BANZHAF VALUES OF GAMES WITH A PRIORI UNIONS

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Owen (1977) defined the Shapley value of a game with a priori unions. Next, he (Owen, 1981) defined the Banzhaf value of a game with a priori unions. His construction of a value of a game with a priori unions can be applied to any value of a game. The Banzhaf value (Banzhaf, 1965) is not a normalized value. So, it may be normalized and the normalized Banzhaf value is obtained. Analogously, the Banzhaf value of a game with a priori unions is not a normalized value. So, it can be normalized.

We obtain the first type of the normalized Banzhaf value of a game with a priori unions. We can also apply the construction of a value of a game with a priori unions to the normalized Banzhaf value and get the second type of the normalized Banzhaf value of a game with a priori unions.

Van der Brink and van der Laan (2002) introduced the third type of a normalized value of a game with a priori unions. Their value is based on the Banzhaf share function.

The fourth value was introduced by Malawski (2003). His value is based on the counting function

. Sosnowska (2003) showed that the first and the second types of values are different. In this paper we also show that they are different from the third and the fourth types, although the third type of value is strongly connected with the second type. The Shapley value and the Shapley value of a game with a priori unions are normalized values. So, there are no troubles with normalization. This fact may be used as an argument for applying the Shapley value in real situations.