ABSTRACT. A bargaining solution is a social compromise if it is metrically rationalizable, i.e., if it has an optimum (depending on the situation, smallest or largest) distance from some reference point. We explore the workability and the limits of metric rationalization in bargaining theory where compromising is a core issue. We demonstrate that many well-known bargaining solutions are social compromises with respect to reasonable metrics. In the metric approach, bargaining solutions can be grounded in axioms on how society measures differences between utility allocations. Using this approach, we provide an axiomatic characterization for the class of social compromises that are based on \( p \)-norms and for the attending bargaining solutions. We further show that bargaining solutions which satisfy Pareto Optimality and Individual Rationality can always be metrically rationalized.

KEY WORDS. bargaining solutions, metric rationalizability, social compromise.

1. INTRODUCTION

In a cooperative bargaining problem, an element out of a set of feasible utility vectors for a group of agents has to be selected. The selected outcome is regarded as the cooperative agreement reached by the agents. In the axiomatic approach, the outcome further is interpreted as the recommendation which an impartial arbitrator who holds certain normative positions would give as to how the bargaining problem should reasonably be solved. In this approach, bargaining solutions are found by combining axioms. Numerous axioms have been proposed in the literature and a number of bargaining solutions has been characterized by the specific combination of axioms which only they do satisfy.

In this paper, we suggest a different approach to the bargaining problem. The central idea is to view solutions to bargaining problems as social compromises in the sense that they minimize the
distance between what the bargaining parties ideally want to have (but typically cannot reach) and what they finally get. Alternatively, we can see the idea of bargaining as leaving behind as far as possible some feasible but undesirable fallback outcome – which also suggests an interpretation in terms of distance. Generally, bargaining solutions as social compromises have an optimal (depending on the nature of the problem, maximal or minimal) distance to some reference point inside or outside the feasible set. Such reference points are common ingredients in bargaining problems, the disagreement and claims points being the most prominent examples.

The concept of social compromises is well-established in several areas of social choice theory. A social compromise generally constitutes a decision rule that selects those elements among the feasible outcomes (which may be single items or subsets in some set of alternatives or societal rankings over the choice set) that come as close as possible to some ideal but not achievable outcome. Closeness is measured by suitably defined metrics or quasi-metrics on the outcome space. If the outcomes of a social choice rule coincide with those of a social compromise, the social choice rule is said to be metrically rationalizable. Stehling (1978), Farkas and Nitzan (1979), Baigent (1987a,b), and Bossert and Storcken (1992) apply this idea to Arrovian social welfare functions. Bossert and Stehling (1993) model Bergson–Samuelson social welfare functions as social compromises. Nitzan (1981) and Lerer and Nitzan (1985) investigate into the metric rationalization of social choice correspondences. In a general approach, Campbell and Nitzan (1986) discuss social decision procedures as compromises between desirable, but mutually incompatible criteria for group decision rules. General ‘minimal distance’ choice functions have recently been discussed in Rubinstein and Zhou (1999).

Transferring the idea of social compromises to bargaining problems, we propose to view bargaining solutions as points at an optimum distance from some reference point. With respect to the disagreement point, the idea of compromise has been in the core of the bargaining problem since its first formal treatment in Nash (1950): Each single agent wishes to maximize his gain over the disagreement outcome, and a solution has to reconcile