Abstract

Two or more players are required to divide up a set of indivisible items that they can rank from best to worst. They may, as well, be able to indicate preferences over subsets, or packages, of items. The main criteria used to assess the fairness of a division are efficiency (Pareto-optimality) and envy-freeness. Other criteria are also suggested, including a Rawlsian criterion that the worst-off player be made as well off as possible and a scoring procedure, based on the Borda count, that helps to render allocations as equal as possible.

Eight paradoxes, all of which involve unexpected conflicts among the criteria, are described and classified into three categories, reflecting (1) incompatibilities between efficiency and envy-freeness, (2) the failure of a unique efficient and envy-free division to satisfy other criteria, and (3) the desirability, on occasion, of dividing up items unequally. While troublesome, the paradoxes also indicate opportunities for achieving fair division, which will depend on the fairness criteria one deems important and the trade-offs one considers acceptable.

JEL Classification: D61, D63.

Keywords: Fair division; allocation of indivisible items; envy-freeness; Pareto-optimality; Rawlsian justice; Borda count.